Design, execution and analysis of livestock breed surveys – a case study in Zimbabwe

A report to FAO

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on
Management of Farm Animal Genetic Resources in the SADC Region

A report to FAO on

The design, execution and analysis of livestock breed surveys – a case study in Zimbabwe

by

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CONTENTS

FOREWORD

This report could not have been completed without the support of many, many people in the planning, execution and analysis of the farm animal genetic resources survey in Zimbabwe. In particular we thank all the smallholder farmers who gave up time to answer the questions posed by the enumerators.

This was a team effort. The responsibility for the planning and execution of the survey was shared between staff in the Department of Animal Science, University of Zimbabwe and Matopos Research Station, Department of Research and Specialist Services (DRSS). They were assisted by staff from Agritex, the Agricultural Extension Service in Zimbabwe, and Amen Mubatsa, Bothwell Makodza, Chipo Kahiya, Basil Mugweni, Bho Mudyahoto and John Muwunganirwa were responsible for provincial supervision. There were also several district supervisors and enumerators - too many to name. All are thanked for the diligent way in which they undertook the interviews with farmers and for the care they took in the details of recording. Indeed, it is a credit to all those in Zimbabwe involved in the implementation of the survey that the survey was successfully completed despite a difficult political situation in the country at the time.

Staff from the International Livestock Research Institute provided back up support to the teams in Zimbabwe, assisted in the design of the questionnaires and the sampling frame, wrote the computer system for entering and storing the data and led the data analysis and the preparation of the final report. Joyce Chege patiently typed, and retyped, the questionnaires and the chapters in this report. Louise Setshwaelo, the Chief Technical Advisor of the project, was the key player from FAO, supported by Hans Wagner and Beate Scherf. We also thank Petros Nyathi of DRSS for his support to the project. Rosemary Rowlands is acknowledged for language editing.

The following 11 chapters demonstrate the achievements gained in the development of the survey framework and its execution. University of Zimbabwe staff wrote the initial drafts for Chapters 3, 5 and 6 and Stanley Makuza and Oswald Matika worked with Sonal Nagda and John Rowlands in the development of the approach to the data analysis. Through our combined efforts we now know that it is possible to undertake a country-wide livestock breed survey. As will be seen, however, it is a complicated and time-consuming task that cannot be taken lightly and requires careful supervision. Tools are provided in this report which can be adapted for use in surveys in other countries. Whether the quality of data will allow the ultimate goals of improved utilisation and conservation of indigenous breeds to be achieved remains to be determined. To find out, a comprehensive statistical analysis, both of the survey in Zimbabwe reported here and of other surveys in countries in sub-Saharan Africa that have since been initiated, will be needed to assess their full worth.

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CHAPTER 1

Introduction

1.1 Farm animal genetic resources

A lack of knowledge, especially in developing countries, of the physical and performance characteristics of indigenous farm animal genetic resources (FAnGR) and the extent of existing genetic diversity has, through pressures to increase production, led to underutilisation, dilution and replacement of these resources through crossbreeding with 'specialised' exotic breeds. For more than 10 years the Food and Agriculture Organisation of the United Nations (FAO) has been developing a Global Strategy for the management of FAnGR. Key elements of the strategy are: identification and characterisation of breeds/populations of species of farm animals; development of methods for sustainable utilisation of the diversity in these populations; global monitoring of the status of FAnGR to minimise losses in genetic diversity; communication of the global importance and value of farm animal genetic resources, the risks of losses in genetic diversity and the implications of such losses; training and involving people in the implementation of the Global Strategy.

FAO recognises that the implementation of the Global Strategy is possible only through the involvement of stakeholders, primarily through national governments and the local communities who own animal genetic resources. The International Livestock Research Institute (ILRI) is collaborating with FAO in the characterisation and documentation of FAnGR. ILRI's primary objective is to improve the understanding of the diversity of farm animal species in developing countries in order to facilitate their conservation and make them available for research and for animal improvement programmes both in the short and the long terms.

Phenotypic characterisation is fundamental to the conservation and sustainable use of FAnGR. It is essential for providing information on breed distribution, breed status (whether breeds are decreasing or increasing in population size or are stable), their production characteristics and the local uses. Breed-level statistics and characteristics are required, not only to quantify the extent of phenotypic diversity, but also to classify individual livestock populations (breeds/strains) on the basis of potential risks of extinction. Farmer breed preferences, together with their indigenous knowledge, may be valuable for national planning purposes, both in determining demand for specific genotypes (indigenous or exotic) and in assessing the potential impact of popular genotypes on less favoured ones. They may also be useful in assessing the types of action that may be necessary to mitigate potential negative impacts of breeding programmes or practices.

1.2 Methods for collecting FAnGR data

This report describes the methodological approaches for conducting a livestock breed survey on farm. A livestock breed survey can be extensive and cover a whole country;

alternatively it can cover a certain region or even a small area to capture small populations of a given breed. It can cover one or several livestock species, and data requirements for each species may vary. An on-farm breed survey, as illustrated in the following chapters, can be organised, for instance, to collect data on breed phenotypic characteristics so that field guides can be prepared listing the principal descriptors of different breeds and their distributions within a country. Where breeds are known to occur in small numbers a survey to gather this information may need to focus on the areas where they are. An on-farm survey, however, can also be used to collect information on the main uses and management of livestock in order to understand the reasons for the distribution and persistence of particular breeds. Finally, it can be designed to collect socio-cultural and indigenous knowledge data, which may be of value in understanding farmers' strategies for keeping specific breeds. Before planning a survey, however, a country's objectives must be clearly written down so that the scope of the survey and the essential questions that need to be answered can be defined. As will be seen from the following chapters the resources required for conducting a full-scale, on-farm survey cannot be underestimated.

If the primary goal is to estimate population numbers of livestock then the country coordinators need to consider very carefully whether they have the resources necessary both for planning an appropriate sampling frame, which is sufficiently extensive to capture a suitable cross-section of the populations of animals, and for carrying out the rigorous, random sampling techniques that will be required. Before embarking on a livestock breed survey it is important to determine what livestock, household or human population statistics are already available. Such ancillary data can be invaluable for the development of an efficient sampling frame and for the optimisation of sampling methods for the calculation of population estimates.

Since the implementation of an on-farm livestock breed survey can be a formidable task there may be other approaches that the coordinators might consider. For example, there may be plans in the country to conduct an agricultural census; if so there may be opportunities to extend the census to cover FAnGR. Alternatively, if only general guidelines are required on breed types, numbers and their uses, a rapid appraisal approach through group meetings with farmers may be all that is required. Such an approach, however, will not yield the quantitative data obtained through the on-farm survey approach.

To reiterate, the objectives for collecting breed data must be clearly defined and the various different instruments that might be used for obtaining these data carefully considered. If an on-farm breed survey appears to be the best approach then the coordinators need to decide what data are required, from which livestock species and from which areas, in order to meet their objectives. They will also need to resolve whether there are adequate resources within the areas where the survey is to be implemented to ensure its successful completion.

1.3 On-farm breed surveys

ILRI has, since 1993, been engaged in research in the development of on-farm breed survey protocols for use by national agricultural research systems (NARS) in developing countries. A national breed survey contributes to the goals of the Global Strategy, namely to characterise FAnGR, to obtain estimates of population size and distribution of FAnGR and to document management, production and socio-cultural practices employed by farmers in raising their animals. Based on experiences of an

initial national survey, there should be opportunities to develop simple survey instruments for regular updating of breed information. With such outputs it is expected that countries will be better able to plan future management, utilisation and conservation of their FAnGR.

In 1999 FAO asked ILRI to provide technical leadership in the construction and organisation of a pilot breed survey in Zimbabwe to evaluate the practical utility of such a protocol. This activity was implemented as the first step in a broader Southern African Development Community (SADC) FAnGR Programme covering all 13 SADC countries. It was funded by the United Nations Development Programme (UNDP) (RAF/97/032) and the Governments of Norway and Finland through the FAO Integrated Support to Sustainable Development and Food Security Program (GCP/INT/694 NOR). The experiences gained in the implementation and execution of the FAnGR survey in Zimbabwe have provided the basis for the implementation of similar breed surveys in the other SADC countries. A livestock breed survey has also been conducted using a similar protocol in the Oromia Region of Ethiopia with funds from the Oromia Agricultural Development Bureau provided by UNDP and with support from ILRI. The methodology has also been applied in Kenya, with funds from the European Union and ILRI, in a survey of sheep and goats in certain districts of the country.

Zimbabwean nationals have played important roles in the planning and implementation of the survey in Zimbabwe and in the development of approaches for the analysis of the results. The aim was to develop local capacity for the benefit of nationals in other countries. The University of Zimbabwe (Department of Animal Science) and the Matopos Research Station of the Department of Research and Specialist Services of the Ministry of Agriculture (DRSS) were the lead national institutions. Staff of the Department of Agricultural Extension (Agritex) also played important roles in the execution of the survey.

1.4 Report summary

This report summarises, in the following ten chapters, the various ingredients of the survey conducted in Zimbabwe, its planning, execution and preliminary analysis.

Chapter 2 describes alternative sampling approaches and shows how the sampling frame was developed for the Zimbabwe survey. It also illustrates the criteria used for determining appropriate sample sizes at the different strata.

Chapter 3 gives an overview of the design of the questionnaire used in Zimbabwe and its organisation and content. The next chapter (Chapter 4) provides more detailed questionnaire guidelines to assist survey enumerators and supervisors in the conduct of the survey. These guidelines describe the respective roles of supervisors and enumerators in the completion of the questionnaires. They also explain how the enumerator should approach each question and how he/she should write the answers.

Chapter 5 presents tips on “Enumerator selection, training and supervision”. Chapter 6 summarises some of the lessons learned from the Zimbabwe survey and the steps to be considered in the implementation and execution of a FAnGR survey.

A computer data capture and storage system, named Breedsurv, has been developed to facilitate the entry and storage of data in an easy and convenient manner. This is described in Chapter 7, which essentially provides a brief ‘user manual’ for the computer system. It describes how data should be entered and also provides details on some tools for data management. Chapter 8 discusses computer data coding and data entry issues and emphasises the steps that can be taken to ensure data of good quality.

It lists too some of the codes used in the Zimbabwe survey. Chapter 9 completes the description of the computer data capture and storage system by describing a number of tables that have been incorporated within Breedsurv itself to facilitate data retrieval. The tables are mainly two-way frequency counts of households, classified in various ways, which allow the user to obtain preliminary information on the results of a survey.

Chapter 10 provides a more detailed, though still somewhat preliminary analysis, of the Zimbabwe survey results for cattle. The main purpose of this chapter is to describe a general approach to data analysis; it uses results from Zimbabwe for illustrative purposes. The chapter summarises farmers' perceptions of the importance and purpose of keeping livestock, illustrates how estimates of population numbers might be obtained, describes herd/flock structures and summarises the disease environments in which the cattle are kept. Results are also provided on farmers' preferences for breeds and their perceptions of the importance of different traits. Methods for summarising breed phenotypic characteristics are described too.

Finally a summary of recommendations for the successful implement of a livestock breed survey is provided in Chapter 11, with the details of the questionnaires used in the Zimbabwe survey included as an appendix at the end of this report.

In conclusion, this report describes not only the survey activities undertaken in Zimbabwe but also serves as a 'guide' or 'manual' for the planning and execution of FAnGR surveys in general. Indeed, the report is deliberately presented in a way that serves this purpose.

CHAPTER 2

Sampling frame

2.1 Introduction

Before planning a livestock breed survey and deciding how to choose the households to be sampled it is important to understand the goals of the survey. As introduced in Chapter 1 the goals of a farm animal genetic resources survey can be summarised as follows

- Document available FAnGR within a geographical area, e.g. country or region, in relation to species/breeds/strains.
- Characterise indigenous FAnGR to quantify extent of diversity within the region.
- Determine breed status and trends.
- Estimate population numbers.
- Summarise performance characteristics.
- Contribute to improved use and conservation of indigenous breeds by:

    - identifying users/uses/preferences,
    - identifying threats and trends,
    - identifying unique/special breed attributes,
    - identifying /developing options for improved use.

- Develop framework and capacity for future surveys/updates.

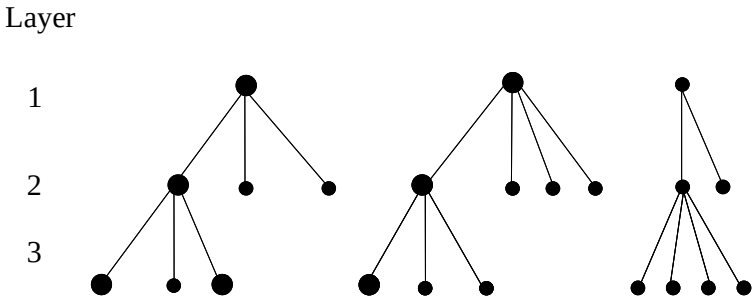
These overall objectives are major and one could say, in practical terms, almost impossible to achieve in countries where household censuses either do not exist or the information contained in them may be of little value for the selection of households to be sampled in the survey. Costs and available resources are also likely to prohibit the design of a truly random survey of sufficient size to determine reliable estimates of population size. The main emphasis therefore may need to be placed in determining distributions of different breeds of livestock across the country. Nevertheless, it will be important to use data from the sampled households to obtain, as far as possible, unbiased population estimates.

In setting out the goals for a survey, decisions also need to be taken on what areas to survey, i.e. the whole country or selected regions (this may depend on available resources) and which species to survey. In Zimbabwe it was decided to survey the whole country in two phases, in order to facilitate the best uses of available resources, and to sample cattle, sheep, goats, pigs, donkeys and chickens throughout. Adequate data on breed numbers were not available at the national level for any of the species. The aim was to achieve a better understanding of the distributions of different breeds of livestock and their approximate numbers. Each questionnaire (see Chapter 3) was designed to collect detailed information on production systems, breeding, mating,

disposal/purchasing and breeding strategies, health, age structure and breed characteristics from one species (primary species), and information on age structure and breed characteristics only in two species (secondary species) selected from the other five. This seemed a reasonable approach for the Zimbabwe situation and meant that the length of interview at the household could be kept within reasonable limits (see section 5.5.6 of Chapter 5). There were, therefore, a total of six questionnaire types implemented (see section 4.1 of Chapter 4, and Appendix 1).

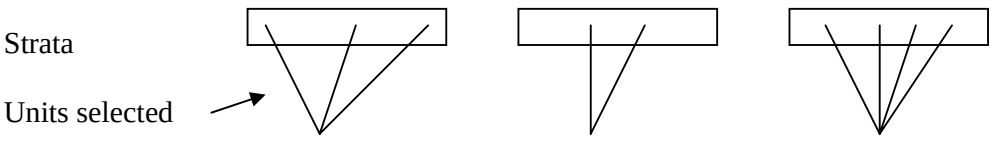
2.2 Methods of sampling

In planning the design of a sampling frame there are different types of sampling techniques that one might use. The first is known as **clustered** sampling. In any country households will belong to a hierarchy of administrative units at different national, regional and district administrative layers as illustrated below.



At the top layer there may, for purposes of illustration, be three administrative units in which two (large dots) are selected. From these units a sample of sub-units (say one each) is selected at the next layer down. There may be a third layer, and so on. In many countries in East and southern Africa these layers correspond to province, district and ward (or similar). The sampling units contained within provinces are districts, those within districts are wards and those within wards are villages. Other countries will have similar administrative layers.

Another method of sampling that can be used alongside cluster sampling is that of stratified sampling. In this method units are put into different strata according to some characteristic such as agro-ecological zone, livestock intensity, farming system, wealth group, etc., which makes the variation within strata smaller than that among strata.



Both these methods are used together for classifying units into groups that have some characteristic in common. Thus, the aim is to minimise variation within groups compared with variation among groups**.** Stratification is an important tool that should play a key role in any FAnGR survey. Stratification based on 'wealth group' at the village level should be seriously considered. Although 'wealth group' may be difficult to define, the variation in animal numbers across households can be large and some

method of stratifying households prior to the survey will enhance the precision with which final population estimates can be determined. Having obtained 'populations' of units by cluster and stratification techniques suitable samples of units need to be obtained. There are different techniques for doing this.

2.2.1 Random sample

Samples are drawn completely at random, i.e. each unit has an equal chance of being selected. When working in a village it may not be that easy to have a table of random numbers at hand so one may need to devise a pseudo-randomisation system, e.g. define a series of trajectories and, walking along them, take every fifth household, say, until the required numbers of households have been obtained for each stratum, and hope that the sample is sufficiently random. Further up the hierarchy (at district level), however, it should be possible to be more rigorous, in ensuring that units for the survey are selected truly at random.

2.2.2 Representative sample

Samples are selected in such a way that the final selection of units is felt to be representative of the sub-population being sampled. The strata formed to define agro-ecological zones, livestock densities, etc., may retain a degree of heterogeneity within them. A completely random sample may miss areas that may be important to include to ensure a representative coverage of a region. Some degree of representative selection may be preferred, therefore, at the upper administrative layers.

2.2.3 Convenience sample

This is the case where samples are selected to ensure, for example, ease of access or to make best use of available manpower. This may produce a sample that may not be truly random of the sub-population being studied, but may be necessary to make efficient use of available resources or to minimise time for conducting the survey.

2.2.4 Purposive sample

In purposive sampling the selection of sampling units is based, for instance, on knowledge of known farming systems or known breed status. It may be considered important to include such a unit within the survey to ensure, for instance, that a particular indigenous breed known to occur in a small area is captured.

Each of these different methods of sampling, namely cluster, stratified, random, representative, convenience and purposive, will feature within the sampling frame of a livestock breed survey. As far as possible samples within clusters or strata should be drawn at random to ensure that sample estimates can be extrapolated to the sub-population that they represent. At the same time other considerations will feature.

It is essential that the methods for stratification and sampling at each layer be fully documented so that it is clear what inferences can be drawn in the final analysis (see, for example, Tables 2.1 – 2.4).

2.3 Sampling frame

The following guidelines are based on experiences in implementing the survey in Zimbabwe. Decisions taken in the Zimbabwe survey are used to illustrate the various points. The survey was conducted in two phases. Slightly different methods were used in Phase 1 and Phase 2.

2.3.1 Regions

As already indicated there may be major administrative regions within a country. In Zimbabwe these are represented by eight provinces. Before initiating a survey one needs to ask how many regions should be sampled. In other words does the country require estimates for the whole country or for certain regions only? Are there sufficient management and financial resources to sample the whole country? In Zimbabwe it was decided to sample all eight provinces, but in two phases to facilitate the use of available resources, with four provinces in each phase.

2.3.2 Districts

Within a region there may be a number of administrative districts. In Zimbabwe there are a total of 57 districts in the country with an average of 7 per province. So how many districts should be sampled per province?

For a national (or regional) survey there may be some requirement to extrapolate the results of the survey to the national (or regional) level. Thus, good coverage is needed at this level. In the Zimbabwe survey it was decided to sample 3 districts per province. It is important that the districts chosen should be chosen so that with minimal bias they can be used to describe the province. Alternate options could be:

1. Broad stratification of the region into 'agro-ecological zones' etc., with selection of districts at random within these strata ('stratified random' sample).

2. Selection of districts based on knowledge of livestock practices, available manpower and other criteria to ensure that different farming systems are covered ('purposive'/'representative' sample).

3. A combination of both.

As has already been stated the final strategy for choosing the districts to be sampled, and the way it is implemented, should be clearly documented for future reference and to guide interpretation of results. Any opportunities for randomisation in the process may be beneficial to the final outcome.

Table 2.1. *Selection of three districts and three wards from each district in Mashonaland East Province for inclusion in the sample of wards surveyed in this province.*

Natural Region	Description	Strata	Numbers of wards[a]	Wards sampled	Method of sampling	Additional notes
II	Murehwa District.		30			
	High potential area, close to Harare.	1. Small scale commercial farming area (SSCFA).		No. 7	Random	Near Murehwa Growth Point.
		2. Communal area near large scale commercial farming area (LSCFA).		No. 15	Random	Adjacent to Macheke/Virginia LSCFA.
		3. Communal area not near LSCFA.		No. 4	Random	Ward furthest away from LSCFA.
III	Chikomba District.		31			
	Mixed farming close to LSCFA and	1. Communal area.		Hampshire	Random	Cattle ranching area surrounded by LSCFA.
	Chivhu town.	2. SSFCA.		Chikomba 1	Random	Resettlement area.
		3. Intensive conservation area.		Manyene 1	Random	
III	Mudzi District.		27			
	Borders	1. On border.		Chikwizo B	Rep.[b]	Located in area of cattle exchange
	Mozambique.	2. In interior.		Chimukoko	Rep.	project with indigenous males
	Also contains area					exchanged for exotic females.
	where the Mukota pig breed is predominant.	3. Mukota pig breed area.		Mukota B	Rep.	Origin of Mukota pig breed.

[a] To estimate population size these overall numbers will need to be subdivided into numbers of wards per stratum.
[b] Representative.

Table 2.2. *Selection of three districts and three wards from each district in Mashonaland Central Province for inclusion in the sample of wards surveyed in this province.*

Natural Region	Description	Strata	Numbers of wards[a]	Wards sampled	Method of sampling	Additional notes
II	Mazowe District.		28			
	High livestock density.	1. Near LSCFA.		Nehanda	Random	
		2. Near an urban area.		Takawira	Random	Near a growth point.
		3. Close to both.		Chaminuka	Random	
II	Mount Darwin District.		32			
	High livestock density area	1. On border.		Matope	Random	
	that borders Mozambique.	2. In interior.		Munhumutapa	Random	Resettlement area, near urban area and LSCFA.
				Karuyana	Random	
	Guruve District.		31			
II	Communal area.	1. High cattle density.		No. 27	Representative	
IV	Communal area.	1. Far from LSCFA.		No. 29	Representative	
II	Resettlement area.	1. Close to LSCFA.		No. 16	Representative	

[a] To estimate population size these overall numbers will need to be subdivided into numbers of wards per stratum.

Table 2.3. *Selection of nine wards from Matebeleland North Province for inclusion in the sample of wards surveyed in this province.*

Natural Region	Description	Strata	Number of wards	Wards sampled	Method of sampling	Additional notes
III	Small area in province.	No stratification.	1	Simbombo	Purposive	Only ward in province with Natural Region III vegetation.
IV	Largest area in province. Contains different soil types and areas of high human populations	1. Gusu sands.	16	No. 11	Random	
			16	Malunka	Random	
			23	Manguni 2	Random	
		2. Non-Gusu sands, subdivided into areas of low and high human populations.	18	Insunza	Random	Resettlement area.
			5	Ntabazinduna	Random	High human population close to Bulawayo.
			5	Dulutsha	Random	High human population far from Bulawayo.
V	Along Zambezi river. Occupied by two tribal groups.	1. Ndebele/Nambiya tribes.	9	Simangani	Random	
		2. Tonga tribe.	14	Siandusu	Random	

Table 2.4. *Selection of nine wards from Matebeleland South Province for inclusion in the sample of wards surveyed for this province.*

Natural Region	Description	Strata	Number of wards	Wards sampled	Method of sampling	Additional notes
IV	Covers Umzingwane and Isiza (A) and Matobo & Bulilimamagwe (B) districts.	<u>Sub-region A</u>				
		1. Near commercial farms.	14	No. 7	Random	
		2. Far from commercial farms.	8	Sababa	Random	
		<u>Sub-region B</u>				
		3. Near commercial farms.	11	Tjankwa	Random	
		4. Far from commercial farms.	12	Makulele	Random	
V	<u>Borders Botswana and South Africa</u>. Wards sampled from those along the border and those in the interior. This region also contains an area where the Tuli breed of cattle is prominent.	1. On border.	19	Maramani	Random	
				Matobo South	Random	Contains old Shashani Resettlement Scheme.
		2. In interior.	21	Mtetengwe 1	Random	
				Dendele	Random	
			3	Ntalali	Purposive	Selected from Tuli breed area.

Different approaches were taken within the first phase of the survey in Zimbabwe. Provinces were shared between the University of Zimbabwe and Matopos Research Station, who supervised two provinces each. The University of Zimbabwe worked with Agritex, the national agricultural extension service, and appointed an Agritex provincial supervisor for each of two provinces in Phase 1 of the survey. Three districts were selected per province based on option 3 described in section 2.3.2, and three Agritex district supervisors were appointed in addition to the provincial supervisor. Matopos Research Station themselves managed the survey in the two Matebeleland provinces. The approach was different, primarily because Agritex had more limited resources in these provinces, and it was thought that it would be easier to work directly with the Agritex extension workers at the village level. Three teams of supervisors and enumerators moved across these two provinces. Districts were not considered in defining the areas to cover in these provinces. Instead, each province was broadly stratified into different agro-ecological zones etc. (see Tables 2.3 and 2.4).

For the second phase both Matopos Research Station and the University of Zimbabwe followed the University of Zimbabwe approach applied in the first phase.

2.3.3 Sub-districts

Within each district there will be a number of administrative sub-districts. In many SADC countries these are referred to as wards. Each district in Zimbabwe is divided into an average of 27 wards. This, then, is the next level which can be sampled. In Zimbabwe it was decided to select three wards per district. This represented 10% of wards in each province. Initially it was planned to select 20% of wards to provide a better estimate of the national distributions of livestock but this was not possible within the budget and time period allowed. The method of selection of wards for the Mashonaland provinces supervised by the University of Zimbabwe in Phase 1 was proposed as follows:

1. Each district was examined to see whether it could be divided, with the assistance of Agritex, into areas of distinct farming system/agro-ecological zones.

2. Each designated farming system area was then studied to see, from secondary sources, whether there were pockets of high and low livestock densities. If so, two groups of wards were formed representing these high and low livestock densities.

3. Wards within high and low livestock density areas were then examined to distinguish those close to commercial farms from those further away. Proximity to urban areas was also considered.

It was planned that this process should achieve no more than three strata or groupings of wards across a district (or, in the case of Phase 1 of the survey conducted at Matopos Research Station, no more than nine strata per province.)

The final choice of three wards per district (or nine wards per province) was then taken as far as possible at random from each of these groupings (stratified random sampling) ensuring, at the same time, that a reasonable spread of wards across the district was achieved. If there were fewer than three (or nine) groupings to select from,

any extra ward(s) to be sampled was taken from the strata with the greatest numbers of wards.

Tables 2.1 and 2.2 provide details of how wards were selected from selected districts in the two Mashonaland provinces. Tables 2.3 and 2.4 illustrate a slightly different approach for the two Matebeleland provinces for which district was not considered in the sampling design. These provinces were divided into strata and wards selected from these strata.

To reiterate what has already been mentioned earlier: it is important that the process adopted for selection of sub-districts or wards is carefully documented and that each grouping of sub-districts from which a sub-district is chosen is described in detail.

2.3.4 Villages

Having identified the sub-districts to sample the next question is how to sample villages. This depends on the number of villages per sub-district. In Zimbabwe it was thought that the number of villages per ward ranged from about 4 to 10. (In fact, subsequent information suggests that the maximum number was closer to 7). It was decided to select two villages from each ward at random. In some cases it was not practical to reach the farthest villages and so sampling was restricted to villages within reach. Thus, an element of convenience sampling was introduced.

2.3.5 Households

Finally, having selected the villages to be sampled, which households should be selected? For the Zimbabwe survey it was decided to sample 18 households stratified according to wealth category. Only households with at least cattle, sheep, goats or donkeys were selected in the survey. In other words households with only chickens and/or pigs were not considered.

Prior knowledge of the number of households with livestock in a village was not available and this information needed to be collected before a random selection of households could be made. Each village selected for the survey was therefore visited before the main survey to list, in a pre-survey, the households with livestock and their approximate numbers of different species, in order to determine a sampling frame for the selection of households. Wealth group was then defined following the advice of the chief of the village and from Agritex's knowledge of the general wealth situation of each household. This did not necessarily relate to the numbers of livestock held by the household, but these were taken into account from the results of the pre-survey.

Approximately six households were then selected at random from each wealth category ensuring that each species of livestock raised in the village was included at least once as a primary species in the questionnaire within each wealth category of households to be included in the survey. Where a village was spread over a wide area it may sometimes have been necessary to confine the location from which the households were to be selected to allow for ease of access by the enumerators.

In hindsight it might have been preferable to take into account the number of households in each wealth stratum. In some villages there were many more households in the medium wealth group than in the other two groups. In such circumstances it would have been preferable to select the numbers of households proportional to stratum size but with a minimum number, say four households, sampled from each group. Thus, for example, one of the villages in Phase 1 of the survey in Zimbabwe had 11, 79 and 19 households in rich, medium and poor wealth groups, respectively. Assignment

of 18 households proportional to stratum size results in 2, 13 and 3 households, respectively. Adjusting these numbers to allow a minimum of four per group gives 4, 10 and 4 households to be sampled in the rich, medium and poor wealth groups, respectively. This is preferable to 6, 6 and 6 for the estimation of population livestock numbers in the village.

Where all six species were represented in a village one household within each wealth group was designated for detailed recording of each species as the primary species. If only five species were represented in the village, then two households were designated for detailed recording of cattle and the other four for detailed recording of the other species. If only four species were represented then two households in each wealth group were designated for detailed recording of cattle, two for the most important of the other species in the village, and one for each the remaining species.

Up to two species (referred to as 'secondary species' for the questionnaire) at each household were also recorded for information on breed characteristics and age structure (see section 3.2.9 in Chapter 3). Enumerators were asked to follow the order in which secondary species appeared in the questionnaire (the order is different for each questionnaire – see Table 4.1 in Chapter 4), but to vary the choice of these two extra species, where appropriate, to ensure as even a distribution of species recorded in the village as possible.

2.3.6 Overview

Following the above recommendations a total of 18 x 2 x 9 = 324 households were to be sampled per province in Zimbabwe. Assuming an average of six villages per ward and 100 households per village with livestock (which from more recent data collected may, or may not, in some areas be an overestimate) this represents a sample of approximately 0.35% – 0.4% or 1 in 250 to 300 of those households raising at least cattle, sheep, goats or donkeys. With each species being sampled in only some of the households the proportion of households sampled for each species is even less. For example, the full details for a primary species will be collected on only one sixth, on average, of the households surveyed, i.e. 1 in 1,500 to 1,800 of households, that is 0.06% - 0.07% of households.

This is a fairly small percentage of the number of households with livestock in Zimbabwe and may be insufficient to achieve one of the primary objectives, namely to obtain estimates of population size. In a survey such as this it is extremely important, therefore, to take care in the selection of the administrative units from which villages are to be sampled. This selection should ensure adequate regional coverage of different farming systems and agro-ecological zones. Across the various administrative units, and also in the villages themselves, stratified random sampling principles need to be adopted as far as possible. Table 2.5 summarises, for the Zimbabwe survey, the various methods possible for the choice of samples at each layer. Those methods used at the ward level for the districts selected in the four provinces in Phase 1 of the survey have already been described in Tables 2.1 - 2.4. These principles can be applied to surveys conducted in other countries, although alternative methods of stratification may be considered.

The numbers of units that were proposed for sampling at each layer in Zimbabwe are given in Table 2.6. As mentioned earlier the proportion of wards sampled per district was smaller than originally planned. When planning the sampling structure it is preferable to sample higher percentages of units at the upper than the lower layers. The total sample size proposed for the survey in Zimbabwe was 2,592 households. This is

just about the maximum size of sample that any country might envisage as being possible with the manpower likely to be available and within a reasonable budget. Countries need to bear in mind the management and organisation aspects of conducting a survey. It is better to undertake a small survey well than a large survey badly.

Table 2.5. Some *methods used for choice of samples for the Zimbabwe survey.*

Layer/cluster	Strata	Sampling method within strata
1. Province	Each province sampled.	Not applicable.
2. District	1. Agro-ecological zone. 2. Farming system.	Purposive/representative/random.
3. Ward	1. Agro-ecological zone. 2. Farming system. 3. Livestock intensity. 4. Commercial farm proximity. 5. Country border/interior. 6. Special breed. 7. Tribe. 8. Proximity to urban area.	Random/representative/purposive.
4. Village	None.	Random/purposive/convenience.
5. Household	Wealth group.	Random/purposive/convenience.

Table 2.6. *Numbers of units sampled in the Zimbabwe survey.*

	Population (average)	Sample	Percentage of population
1. Province	8	8	100
2. District/province	9	3	33
3. Ward/district	27	3	11
4. Village/ward	6	2	33
5. Household/village	100 (approx.)	18	18

2.4 Population data

Again it cannot be emphasised enough how important it is to document within each cluster/stratum the method of sampling, and also to list the population of households, villages etc. from which the selections of samples are made. These data are necessary for the estimation of breed numbers. Thus, in selecting units from a region divided into different agro-ecological zones, it is important to record how many units (districts, wards) belong to the population of units in the stratum from which the sample is selected. Furthermore, at the village level it is important to know how many households in the village from which the sample is drawn belong to the different wealth categories. Without such information it is not possible to determine estimates of population size.

To improve the precision of population estimates at the ward level, information on the total numbers of households with livestock in the other villages that are not sampled in the ward is also desirable. Numbers within each wealth group, however, are not needed for the non-sampled villages. The detailed information that is ideally required is illustrated in Tables 2.7 - 2.9. Information at the village level may well need to be collected prior to the main survey.

The precision with which breed numbers can be estimated can also be improved through use of ancillary census information. It may be that information on households with livestock may not be available from census data, but, information on numbers of households by village across the country, regardless of whether they have livestock or not, may be. Knowledge of the numbers of households that possess different species of livestock, as a proportion of all households in the villages in which the survey is conducted, can then be used to extrapolate sample results to the population at large. None of this information was available in Zimbabwe.

Table 2.7. *Illustration of the population data required for each province to allow appropriate interpretation to be made of survey results and population numbers to be estimated for a province (numbers in the table are given for illustrative purposes).*

District no.	Sampled	Stratification[a]	No. of wards	Average number of households per village [b]
1	Y	.	22	82
2	N	.	26	86
3	N	.	27	99
4	Y	.	23	66
5	N	.	21	70
6	Y	.	20	96
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.

[a] Agro-ecological zone, livestock density, farming system etc. Dots indicate some form of stratification defined, although not described here.

[b] Calculated as the mean of the average number of households per village per ward. If the numbers of households in non-sampled wards are not known then the average numbers of households in the districts will need to be estimated from the average numbers of households in the sampled wards only. This may make estimation of livestock numbers at the province level somewhat imprecise.

Table 2.8. *Illustration of population data required for each sampled district in each province to allow appropriate interpretation to be made of survey results and to allow population numbers to be estimated for a district (numbers given are for illustrative purposes).*

Ward no.	Sampled	Stratification [a]	No. of villages	Average number of households per village [b]
1	Y	.	5	81
2	N	.	6	98
3	N	.	6	70
4	Y	.	5	112
5	N	.	5	60
6	Y	.	6	97
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.

[a] Agro-ecological zone, livestock density, farming system etc. Dots indicate some form of stratification defined, although not described here.

[b] Calculated as the average of the numbers of households per village. Thus, the value for Ward 1 is the average of the values given in Table 2.9. If the numbers of households in non-sampled villages are not known then the average will need to be estimated from the average number of households in the two villages sampled (i.e. 70, see Table 2.9).

Table 2.9. *Illustration of the population data required for each sampled village in each ward to allow appropriate interpretation to be made of survey results and to allow population numbers to be estimated for a ward (numbers given in table are for illustrative purposes).*

		Number of households			
Village	Sampled	Rich	Medium	Poor	Total [a]
1	Y	20	32	24	76
2	Y	16	30	18	64
3	N	.	.	.	90
4	N	.	.	.	102
5	N	.	.	.	72

[a] Data on total numbers of households in non-sampled villages will be ideally required for the estimation of ward population numbers. If these are not known then the average numbers of households in the sampled villages only will need to be used to estimate the average number of households per village in the ward (see footnote to Table 2.8).

Table 2.10 further summarises the details contained in Tables 2.7 - 2.9. It provides a list of the population information required in order to calculate the required population or sub-population estimates.

Table 2.10. *Information needed to be documented on population structure and sampling methods used in the planning of the sampling frame of a livestock survey.*

For each ward (sampled or not) in each sampled district:

a) Province in which it lies
b) District in which it lies.
c) Number of villages in ward.
d) If available, census data on number of households in ward or some other measure which gives some proxy estimate of village/ward size.

For each province:

a) Number of districts in province.
b) Number of districts included in survey.
c) Method of selection of districts to be sampled - if province is to be stratified then a) and b) need to be separated by strata.
d) Description and definition of strata.

For each sampled district in survey:

a) Number of wards in district.
b) Number of wards included in survey.
c) Method of selection of wards to be sampled – if district is to be stratified then a) and b) need to be separated by strata.
d) Description and definition of strata.

For each sampled ward in survey:

a) Number of villages in ward.
b) Number of villages included in survey.
c) Method of selection of villages to be sampled.

For each sampled village in survey:

a) If available, census data on the number of households in village.
b) Numbers of households with livestock (provided under a) or collected at the time of the survey).
c) Number of households in survey.
d) Method of selection of households – if households are to be stratified, e.g. by wealth group, then b) and c) need to be separated by strata.
e) Description and definition of strata.
f) GPS reading (to be obtained either when the village is surveyed or digitised later from the position of the village on a map).

2.5 Estimation of population values

To illustrate how information in Tables 2.7 - 2.9 can be used to estimate the total number of animals for a given species in a village, suppose that n households are sampled in a village with N households in total, and suppose that the average numbers of animals for a given species per household in those households sampled is m.

Then the estimate of the village total for the N households is Nm,

The variance of the village total is $N(N-n)s^2/n$ where s^2 is the sample variance $= \sum (y_i - m)^2/(n-1),\ i = 1, \ldots, n$ and y_i is the number of animals in household i.

The standard error, which provides a measure of the precision with which the estimate of the total is obtained, is the square root of the variance

$$= \sqrt{N(N-n)s^2/n}$$

Thus we can write the population estimate as

$$Nm \pm \sqrt{N(N-n)s^2/n}$$

Suppose now that the households in the village are stratified by wealth (N_1 rich, N_2 medium, N_3 poor) where $N = N_1 + N_2 + N_3$. Thus, for village 1 in Table 2.9, N_1, N_2 and N_3 are, respectively, 20, 32 and 24. The formulae become a little more complicated.

The estimate of the village total is now $\sum N_j m_j$.

The variance is given by $\sum [N_j (N_j - n_j) s^2_j / n_j]$ where the summation is over j = 1,2,3.

The standard error is the square root of the variance.

The formulae for cluster sampling are more complicated, although the forms of the expressions are similar, namely that they depend on population values N and sample values s^2 and n at different layers, and in different strata. The use of such formulae is necessary for calculating estimates at the ward and district layers. The more precisely values for N can be determined the more precisely will the population estimates be determined. An example of how the theory is extended to the ward level is given in section 10.10, the appendix to Chapter 10, with an illustration of its application in section 10.6.1 of the same chapter.

The sizes of the standard errors given above depend on s^2 and n. Stratification helps to control the size of s^2, and increasing the sample size increases n. One way to increase the sample size, without increasing the number of households in the main survey itself, is to sample extra households from which more limited information on numbers of livestock can be obtained. A simpler questionnaire can be designed for these extra households to determine just the numbers of animals in each breed of species of livestock kept. A simpler database can then be designed to hold these extra data and

into which corresponding data from the main survey can be extracted from Breedsurv (see Chapter 7).

The precise formula to be applied for population estimation depends on the sampling structure used in a particular survey and the layers in the sampling frame where estimates are required. Further guidelines on the calculations of population estimates are needed but these will be best developed as an addendum to this report once the final analysis of the survey in Zimbabwe, and also those in Ethiopia and Kenya, has been completed. In the meantime a reader might like to refer to a text book on sampling methods. There are various books that have been written on the subject but two that have relevant chapters are:

Thompson, Steve, K. (1992). *Sampling.* John Wiley & Sons, Inc., New York, U.S.A., 358 pp.

Yamane, Taro (1967). *Elementary Sampling Theory.* Prentice-Hall, Inc., Englewood Cliffs, New Jersey, U.S.A., 415 pp.

2.6 Summary

In developing a sampling frame it is important to ensure that there is sufficient replication at the top layers. Thus, in the ideal situation, more wards, and perhaps fewer households per village, might have been sampled in the Zimbabwe survey. Ideally, the number of households sampled per village should be in proportion to the size of the village. However, as this is unlikely to be known at the time of designing the sampling frame, it will usually be necessary to plan for a fixed number of households per village. Also, in a survey such as this, account needs to be taken of the costs of mounting a survey, the manpower available, the existing infrastructure, the quality of data enumerators, etc. If too many units are sampled at the upper layers, which will utilise a larger task force, adequate control may be lost and the resulting quality of the data collected could be impaired.

In conclusion, the major goals in the design of a sampling frame for a FAnGR survey are to:

- Obtain high quality data from a manageable sample of households.
- Ensure that sampling units at the various layers of the sampling frame are selected as far as possible at random and in proportion to the sizes of the different strata.
- Where possible put more emphasis on adequate replication at the upper than the lower layers.
- But match this latter requirement with knowledge of available manpower, resources (transport, etc.), adequacy of infrastructure (administration, roads, etc.), quality of field staff and the size of the budget.

CHAPTER 3

Questionnaire design

3.1 Introduction

The questionnaires for the Zimbabwe breed survey were designed for six species: cattle, sheep, goats, pigs, donkeys and chickens. These are the major livestock species found in Zimbabwe, especially in the smallholder sector. Each questionnaire has a primary species, e.g. cattle (see section 4.1 of the next chapter), on which detailed information is required; on the same questionnaire certain specific information is also included for the other species. This was done to reduce the length of the questionnaire and the time taken for an interview, whilst, at the same time, ensuring that as much information as possible was obtained on each species across a reasonably large number of respondents. This chapter describes the general approach to the design of the questions. Chapter 4 gives detailed guidelines.

3.2 Organisation of questionnaires

Each questionnaire has a title page (section 4.2 of the next chapter) providing general identification of the household, followed by information on the household itself. This page also describes the species, cattle, sheep, goats, pigs, donkeys or chickens, which features as the primary species in the questionnaire. This is followed by information required for this species. The page providing general information on the household is followed by pages describing production system, health, castration/entries/exits/culling, breeding, breed/age/sex structure and phenotypic description characteristics. When cattle are the primary species the remainder of the questionnaire has breed/age/structure and phenotypic descriptions for pigs, sheep, chickens, donkeys and goats (Table 4.1). Details of the full contents of the questionnaires are provided in Appendix 1. These questionnaires were produced after a series of review meetings during the early part of 2000 with experts in various fields of specialisation. They were pre-tested in the field in July 2000 and further refined for use in Phase 1 of the survey which started in October 2000 (Table 6.1 of Chapter 6). They were reviewed again at a SADC workshop in Bulawayo in February 2001 and further refined for use in Phase 2 of the survey that began in September 2001. The questionnaire contents shown in Appendix 1 are those used in Phase 2 of the Zimbabwe survey.

3.2.1 Title page

In addition to the information above, the title page (section 4.2) also has information on province, district, ward and village, in order to identify the geographical location of the household and information on the wealth category to which the household belongs (see section 2.3.5 of the previous chapter). The first page also identifies the enumerator who completed the questionnaire and his/her supervisor. This is important for follow-up.

3.2.2 Household general information

This section (also described in section 4.3 of the next chapter) has general information about the household. The tribe of the household family is included because this may be associated with the livestock preferred. The area of the land holding under crops, grazing or forest is included to provide information on the relative importance of crops and livestock. The source of cash income is also included on this page. Households derive cash income from crops, livestock and non-farm cash sources. Ranking of the livestock is required because of the different uses of different species of livestock in different natural regions of Zimbabwe. For example, cattle are important for draught power provision in areas where crops are produced. Donkeys are also important for this function but in the semi-arid areas of the country.

3.2.3 Production system

Systems of production are different depending on the livestock kept and the natural region. For example, cattle production systems in the high rainfall regions in Zimbabwe (e.g. Natural Region II) are often considered to be semi-intensive but systems in the semi-arid areas (Natural Regions IV & V) are usually extensive. As in other smallholder farming systems in the world, livestock in Zimbabwe are often kept for multiple purposes – a question for this is included (see section 4.4). The grazing/feeding and housing systems can vary with season. These systems can have influence on breeding options and animal performance. Questions on these are included.

3.2.4 Health

Health data are necessary because of the possible influences of disease prevalence on livestock species and breed distribution, and as an indication of the disease stresses to which different livestock populations are exposed. This section of the questionnaire (section 4.6) attempts to document prevalent diseases as seen by the farmer, together with treatments and vaccinations given, and the systems of tick, tsetse and endoparasite control applied (section 4.7). Tick control is necessary across the whole of Zimbabwe, has been practised for a long time and is critical for the survival of some cattle breeds. There are also a few areas that are still infested by tsetse flies. In these areas livestock are often limited in number.

3.2.5 Castration/entries/exits/culling

The question on whether castration is practised (see 4.8 of the next chapter) is included because farmers castrate males for a variety of purposes. Castration has implications on breeding and reproductive performance. Most farmers, especially in major crop production areas, have small herds of cattle. Animal movements (exits and entries) are common to facilitate acquisitions for critical functions such as draught power provision, social rituals and other emergency household expenses. These movements can influence breeding options and systems. Method of sale is included in the questionnaire because of possible variations across the country and the potential mixing of cattle from diverse sources. Reasons for culling are included because of possible influences on breed development and breed characteristics. Specifically, such information could indicate if exits from herds of animals belonging to specific breeds may be correlated with certain problems or indicate poor adaptation.

3.2.6 Breeding

The questions in this section (4.9) are intended to establish the reasons for keeping or choosing a male, the mating system and sources of sire breeds. The breed of a species being kept and the possibility of crossbred livestock being produced are partly dependent on these factors. The small herd sizes and proximity to sources of cattle (e.g. commercial farms) can influence breed diversity and characteristics.

3.2.7 Breed/age/sex structure

This is a key section of the questionnaire. There are pages for both pure breed and crossbreeds (sections 4.10 and 4.11). The questions here seek to determine herd structures, the population trends, origin or source of the farmer's breeds used in producing crossbreeds and the qualities of breed traits perceived by the farmer. The information on crossbreeds is as important as that on pure breeds because of the high prevalence of crossbred cattle in the smallholder-farming sector of Zimbabwe. Analysis of these data may help in the understanding of population trends.

3.2.8 Phenotypic description

The information requested under this section (4.12) is important for the characterisation of pure breeds. The details requested vary across species but essentially cover descriptions of animal coats, colours, body sizes and shapes, and profile descriptions in relation to face, horns, ears etc. In many cases height or length characteristics are classified by actual measurements. This is an attempt to provide a quantitative measure of size rather than the more subjective assessment given by 'small', 'medium' or 'large'. The enumerator needs to carry a measuring stick. A colour chart is provided (see Appendix 2) to summarise animal colours. This was developed because enumerators have different perceptions of coat colours. Using the colour chart helps to standardise colour definition. The enumerator needs to carry a colour chart with him/her.

3.2.9 Secondary breeds

The other species of livestock in the cattle questionnaire are not recorded in as much detail as cattle because the duration of the interview would have been extended beyond the desired maximum of one to one and a half hours. Information on breed/age/sex structures and phenotypic descriptions is recorded for other species as for pure breeds of cattle and for crossbred cattle. However, some information specific to the species, for example, prolificacy for sheep and goats (section 4.9.1), farrowing intervals for pigs (section 4.9.2), are also included. The enumerator is expected to collect information on two additional species of livestock, selecting them, as far as possible, from the order in which they occur in the questionnaire. The complete questionnaires, containing full details for one species as the primary species together with Breed/age/sex structure and Phenotypic description pages for the other species, were assembled by species in the orders shown in Table 4.1 of Chapter 4.

3.3 Final comments

The objectives of the FAnGR survey determined the content of the questionnaire. The format of the questionnaire needs to be logical in order to collect the required information easily. The sequence, format, wording and ordering of questions also needs to be properly developed in order that the administration of the questionnaire is easy, and the interest and participation of the farmer can be captured. As already mentioned the final forms of the questionnaires shown in Appendix 1 are products of inputs from experts in various disciplines and areas of specialisation, and revisions brought about from pre-tests and execution of the first phase of the survey itself. The notes contained in the next chapter have been prepared in order to facilitate the accurate completion of the questionnaires by the enumerators.

CHAPTER 4

Questionnaire guidelines

These guidelines have been prepared for use both by enumerators and supervisors**.** It is suggested that this chapter be separately printed and bound for the enumerators and supervisors to have them with them during the execution of a survey. Indeed, an enumerator should periodically read carefully through these guidelines during the execution of the survey to refresh his/her mind on how the different pages of the questionnaire should be completed. It is advised that this should be done at least once for each village. If the enumerator wishes to write down extra information provided by the respondent, for which there is not a suitable box on the form, he/she should do so. Just write the comment nearby on the page of the questionnaire.

4.1 Questionnaire format

The questionnaires have been prepared in a number of formats (Table 4.1). Each questionnaire covers six species: cattle, sheep, goats, chickens, pigs and donkeys for the Zimbabwe survey, but the number and choice of species may be different for other countries.

Detailed questions covering production system, health, etc., are included on pages 1-7 for the species named on the title page (CATTLE, SHEEP, etc.) – this species is referred to as the primary species; only questions pertaining to breed structure and phenotypic description are included for the other breeds (Pages 8-10) – these are referred to as secondary species.

Although there are pages for up to six species within each questionnaire it is not expected that data will be collected on more than three species. The enumerator needs to gauge the receptiveness of the respondent to further questioning following completion of the questions on one of the secondary species – it is important that the enumerator should not take much longer than one hour interviewing the household head or his representative (1½ hours at the most) plus some time with the livestock. The sample size of the survey is on the small side so that it is imperative that as much information as possible is collected from a household, but, at the same time, this must be carefully collected and be accurate.

The two secondary species to be recorded should be selected as far as possible in the order in which they occur within the questionnaire. The order of the secondary species in the questionnaires used in the Zimbabwe survey was intentionally made different for each primary species to give each species present in the village a fairly equal chance of being recorded throughout the village (Table 4.1). Because the questionnaires were prepared in booklet form with 24 pages it was not always possible to include the phenotypic description page for the last species or two (see Table 4.1). If either of these species is recorded then details of its phenotypic characteristics are not required.

These guidelines are written for Phase 2 of the Zimbabwe survey. The 10-page questionnaires for each of the primary species are shown in Appendix 1. Each page

number has a letter included (e.g. 1c-10c for cattle) to distinguish these pages from those for other species. Pages 11 to 24 of the questionnaires contain the corresponding page numbers 8-10 for the other five species. The complete questionnaires of 24 pages for the Zimbabwe survey were put together as shown in Table 4.1.

Table 4.1. *The primary and secondary species in the order in which they occur in each questionnaire used in the Zimbabwe survey.*

Primary species	Secondary species				
Cattle	pigs	sheep	chickens	donkeys	goats [a]
Sheep	chickens	cattle	donkeys	goats [a]	pigs [a]
Goats	donkeys	pigs	sheep	chickens [a]	cattle [a]
Pigs	cattle	donkeys	goats	sheep [a]	chickens [a]
Chickens	sheep	goats	cattle	pigs	donkeys
Donkeys	goats	chickens	pigs	cattle	sheep [a]

[a] Phenotypic description page omitted. The number of pages for chickens and donkeys as primary species were fewer (8 and 9 pages, respectively) than for the other species, which have 10 pages (see Appendix 1). The total number of pages in each questionnaire is 24 to allow the questionnaire to be prepared in booklet form with all pages used.

4.2 Title page

Prior to the survey the different administrative layers (e.g. province, district, ward and village) will have been given a unique numeric code. Code numbers will also have been assigned to enumerators and supervisors. These lists should be made available to the enumerators.

Questions 1-4. Province, District etc.
The enumerator should fill in the first page, writing alongside each heading both the name and code number. (Only code numbers are entered subsequently in the computer data capture and storage system, known as Breedsurv (Chapter 7), but the system validates them against the names).

Question 5. Farm type
'Large-scale commercial' is typically used for traditional large commercial farms in countries such as Zimbabwe. 'Small-scale commercial' falls some way between that of a smallholder farmer managing a few livestock for himself/herself and the large commercial farm.

Question 6. GPS reading
If GPS's are not available then details of the exact location of the village need to be recorded by the supervisor on a map for subsequent entry by the central coordinating office.

Question 7. Household
Each household needs to be given a unique number that can be used in future to identify the household from the list of all households in the village. This can be a number from 1 upwards for the sample of households selected or another number that uniquely defines the household in the village. This is for the supervisor to decide. Household

numbers need only be unique within a village – the same numbers can be used in different villages.

Question 8. Wealth category
Households may have been selected for the survey on the basis of their wealth. If so, tick the relevant category: rich, medium or poor. If wealth has not been used as a selection criterion then tick 'Not classified'.

4.3 Household. General Information (Page 1c)

From here onwards instructions refer to the cattle questionnaire. Where special notes are required for other species these are discussed separately under the species heading.

Question 1. Respondent
Write down the name of the respondent and tick below his/her position in the household.

Question 2. Household head
Note that this information is for the household head **not** for the respondent - he/she being interviewed may not be the household head. Tick 'Sex' and one of the 'Age' categories. If age is not known tick 'Not known'.

Question 3. Tribe
This question may be sensitive and it may be preferable not to ask it directly – the enumerator may be able to infer the answer to this question from other information available. A list of tribes in the country may have been prepared prior to the initiation of the survey. If so, write down the name of the tribe and, from the list, the code number. If the tribe is not included in the list, leave the code number blank. A list of tribes was not provided in the Zimbabwe survey. The coding was handled by the central coordinating office.

Question 4. Number of people residing in household
Enter only those people permanently residing at the household. Exclude anyone who has a job elsewhere and is not living at the household but at the location of his/her employment.

Question 5. Land holding / farm size
Put a tick against the individual boxes for 'Crops', 'Grazing' and 'Forest' if known. If individual sizes are not known just complete box for 'Total size'. Tick the unit of measurement (acres or hectares) that is being used.

Question 6. Land ownership
Some land may be owned, other leased. If so, tick both 'Own' and 'Lease'.

Question 8. Sources of income
Tick the boxes in first column for which different sources of income are obtained. **Ask the question in an open manner**, i.e. do not go through the list one by one but ask the respondent in a general way how income is obtained for the household. Having ticked certain boxes ask the respondent to list the sources of income he/she has specified in

order of importance. At this point the enumerator should mention that there are benefits from non-cash outputs such as manure, traction, etc., and that these should be taken into account in the ranking.

Question 9. Livestock kept

Ask for numbers for each species in turn. For species not raised in the household write 0 to indicate zero. Do not leave a blank. For chickens just include adult birds. For other species include all ages. A more detailed breakdown for certain species will be required later in the questionnaire (see 4.10). Do not be concerned if the numbers given in 4.10 do not match with those given here – leave the numbers entered here as those given by the respondent in answer to this question. For those species ticked in this question ask the respondent to rank their importance to the household. An example is given below.

	Numbers	Most important species
1. Cattle	**12**	**1**
2. Sheep	**0**	
3. Goats	**30**	**3**
4. Chickens	**15**	
5. Pigs	**0**	
6. Donkeys	**6**	**2**

Question 10. Livestock production category

For most smallholder farmers livestock will be dual purpose. If so, copy the numbers from Question 9 to the 'Dual purpose' box. If not, split the numbers given in Question 9 between 'Dairy', 'Meat' and 'Dual purpose'.

4.4 Cattle. Production System (Page 2c)

Question 1. System of production

One or more boxes may be ticked. For a smallholder farmer the production system for cattle is most likely to be 'Extensive / pastoral'. In high potential agricultural areas, however, animals may often be stall-fed or tethered. This question is identical for each species that occurs as a primary species and has been designed to cover all possible production systems that may occur for different species.

Question 3. Purpose of keeping cattle

This should be asked as an open question – i.e. let the respondent provide the answer unaided. Do not go through the list of alternatives one by one. Tick any answers given in the first box. Then ask the respondent to rank the top three. If only two answers are given then they should be ranked 1, 2. The enumerator should remind the respondent at the time of ranking which items have been ticked. An example is given below. (For this and the following examples read 'Y' to mean 'tick'. The symbol for 'tick' is not recognised by certain printers.)

1. Meat ……	**Y**[a]	**3**
2. Milk ……		
3. Work/draft ……		
4. Stud breeding ……		
5. Manure ……	**Y**	
6. Blood ……		
7. Hide ……		
8. Cash from sales ……	**Y**	**2**
9. Investment ……	**Y**	**1**
10. Dowry ……..	**Y**	
11. Ceremonies ……..		
12. Cultural ……...		

[a] Read 'Y' as 'tick'.

Question 5. Members of household responsible for cattle activities

For this question go through each activity in turn and tick the appropriate boxes. Where an activity is carried out by more than one category of household member (e.g. male and female adults) tick each category. If an activity does not feature within the household leave all boxes for this activity blank. Thus, in the following example a number of activities are shared by more than one member of the household as indicted by the range of ticks. However, manufacture and selling of dairy products is not done by this household and these boxes are left blank.

	Adults		Boys	Girls	Hired
	Males	Females	(<15y)	(<15y)	labour
1. Purchasing cattle ……	**Y**[a]	**Y**			
2. Selling / slaughtering cattle	**Y**				
3. Herding ……..		**Y**	**Y**		
4. Breeding decisions ……	**Y**				
5. Feeding ……..		**Y**	**Y**		**Y**
6. Milking ……..		**Y**		**Y**	
7. Making dairy products …..					
8. Selling dairy products ……					
9. Animal health ……	**Y**				

[a] Read 'Y' as 'tick'.

Question 6. Grazing/feeding

Tick one box only for each season. If more than one method is used within a season tick the most prevalent. Remember to complete the question at the foot of the page – 'Are calves grazed/fed together with adults?'

Question 7. Housing

Tick one box only for each season. If there is more than one type of housing tick the most prevalent. Remember to complete the question at the foot of the page – 'Are calves housed together with adults?'

4.5 Cattle. Production System (continued) (Page 3c)

Question 8. Materials used for housing
Only complete if animals are housed.

Question 9. Form of housing
Just tick one type of floor.

Question 10. Supplementation regime
More than one may be ticked. If no supplementation is fed tick 'None' – do not leave question blank.

Question 12. Source of water
Municipal/piped has been included for those species such as pigs for which water might be piped directly to the location where they are kept.

Question 13. Distance to farthest watering point
The respondent may not know the distance. Ask him or her to point out on the landscape where the watering point is or ask how long it takes for a person to walk to the watering point. The first alternative ('At household') for this question is for a water supply within the immediate area of the household compound. If walking is required outside the compound, but within 1 km of the compound, tick '<1km'.

4.6 Cattle. Health (Page 4c)

Question 1. Access to veterinary services
Tick one or more.

Question 2. Prevalent diseases that occur on farm
Ask the respondent to give the diseases that occur in the animals that belong to the household. He/she is not to give an answer that reflects the general disease situation in the area. Ask first for the most common disease, then for the second most common disease and so on. If the respondent says that there are no diseases, tick the 'None' box. Write down legibly any name that the respondent gives – this could be a local or common name for the disease or a description of the symptoms observed. Neither the enumerator nor the supervisor should enter a code. Leave the code box blank. This will be completed later by the central co-ordinating office with the co-operation of a veterinarian where necessary.

If an animal is treated when sick write down what is done. Each line under treatment should be completed for each disease. Again leave code blank. **Note that vaccinations are not to be included here – these should be written under Question 3.** The following is an example of the answer to this question.

Local name or symptoms of disease *(Rank most common first)*	Code	Are animals treated when sick? Yes	No	Treatment given (if known)	Code
1. **Quarter Evil** _____			**Y**	_____	
2. **Lumpy Skin disease** _____		**Y**		**Antibiotic**_____	
3. _____				_____	
4. _____				_____	
5. _____				_____	
6. _____				_____	

Question 3. Vaccination / preventive treatments given

Complete as for Question 2. Give the common or local name of the disease or symptoms of the disease which is vaccinated against, **not the name of the vaccination given.** Note that some of these diseases may not be among those listed in Question 2. If the vaccination is effective then these diseases will, of course, not occur on the farm. If no vaccinations or preventive treatments are given tick the 'None' box.

This question is primarily aimed at covering those diseases that the household takes measures to prevent. Thus, the respondent may include diseases that the household tries to prevent with treatments other than vaccinations. Include all such diseases for which preventive measures are taken, but exclude tick, tsetse or worm control as questions for these are on page 5c. Again neither the enumerator nor the supervisor should enter a code for the disease. This will be done later by the central co-ordinating office.

Tick whether preventive treatment is 'Done routinely' or 'Done when need arises'. 'Done routinely' will include, for example, vaccinations applied when an animal is young or applied annually. 'Done when need arises' will generally apply when vaccination or treatment is given when symptoms of disease have started to occur in some animals in the herd.

4.7 Cattle. Health (continued) (Page 5c)

Question 4. Ectoparasite control

Ask first if any method of ectoparasite control (primarily for ticks) is practised. If ectoparasite control is not practised tick 'None', otherwise tick the method or methods used. If 'Traditional' is ticked describe also the method. Leave code box for traditional method blank; this will be completed later by the central co-ordinating office.

Tick, for each season, one of the alternatives 'Done when need arises' or 'Done routinely', and, if the latter, specify how often. If done only once a month write 4 weeks, if done once every two months write 8 weeks, etc. Write 24 if done only once during a season. (This is understood as once every 24 weeks or once every 6 months, and will be interpreted as being once a season.) An example for completion of this question is shown below with the letter Y again implying that the box has been ticked.

Method	(Tick)	Done when need arises: dry season	Done when need arises: wet season	Done routinely: dry season	Done routinely: wet season	*If done routinely specify how often*: dry season			*If done routinely specify how often*: wet season		
1. None											
2. Dip	**Y**			**Y**	**Y**	every	**2**	weeks	every	**1**	weeks
3. Spray						every		weeks	every		weeks
4. Pour-on						every		weeks	every		weeks
5. Hand dressing						every		weeks	every		weeks
6. Injectibles						every		weeks	every		weeks
7. Traditional	**Y**	**Y**	**Y**			every		weeks	every		weeks

If traditional method specify ____ **greasing** _____ Code

Question 5. Trypanosomosis control

Trypanosomosis occurs rarely in Zimbabwe; this question may be more applicable in other countries. If not applicable or no control is practised tick 'None (n/a)'. Otherwise tick the appropriate treatment(s) given. If 'Traditional' is ticked write down also the traditional method used. Complete the remaining part of this question as for Question 4.

Question 6. Intestinal parasite control

Complete as for Question 4.

4.8 Cattle. Castration/entries/exits/culling (Page 6c)

Question 1. Castration

Ask, for the last part of this question, an approximate average age for castration. If the respondent does not know, then leave blank.

Question 2. Number of entries within last 12 months

First ask the respondent to state how many calves have entered the herd within the last 12 months, likewise how many older animals. **Write the numbers in 'Calves' and 'Total (W + A)' boxes, respectively.** 'W + A' stands for weaners plus adults. If the respondent does not know, write X in the appropriate boxes in these two columns; if number is known to be zero, write 0.

Having completed the 'Total (W + A)' column ask the respondent, for each category in which a number >0 has been given, how many were weaners, female adults and male adults, respectively. (The respondent should have an understanding of the meaning of 'weaner'; if in doubt, it is a weaned animal prior to becoming a mature, fully performing adult). If the respondent cannot answer this question fill the relevant boxes in these rows with Xs. Values for 'Weaners', 'Males' and 'Females' in rows in which the 'Total (W + A)' box contains 0 or X can be left blank. Two examples are given on the next page.

		Weaners and Adults			
			Adults		Total
	Calves	Weaners	Males	Females	W + A
1. Born ……..	**2**				
2. Bought ……	**0**	**0**	**0**	**1**	**1**
3. Donated/gift …..	**0**				**0**
4. Exchanged/lent ..	**0**				**0**

In this example the respondent has provided the information that two calves were born, that no other calves were acquired and that one older animal was bought. It was a cow (adult female). Note that, since values for 'Donated/gift' and 'Exchanged/lent' in the final column are zero, the 'Weaner' and 'Adult' columns have been left blank.

		Weaners and Adults			
			Adults		Total
	Calves	Weaners	Males	Females	W + A
1. Born ……..	**X**				
2. Bought ……	**0**	**X**	**X**	**X**	**10**
3. Donated/gift …..	**0**				**0**
4. Exchanged/lent ..	**0**				**0**

In this example the respondent could not remember how many calves were born. Ten animals were bought but he/she could not recall within which categories. Thus, the 'Weaners' and 'Adults' boxes for 'Bought' have been filled with Xs. It was not necessary to fill the other boxes since the W + A totals are zero.

If ever in doubt enter X in any blank box. The people responsible for data entry will know how to deal with the information provided. An example is given below.

		Weaners and Adults			
			Adults		Total
	Calves	Weaners	Males	Females	W + A
1. Born ……..	**X**				
2. Bought ……	**0**	**X**	**X**	**X**	**10**
3. Donated/gift …..	**0**	**X**	**X**	**X**	**0**
4. Exchanged/lent ..	**0**	**X**	**X**	**X**	**0**

Question 3. Numbers of exits within last 12 months

Complete as for Question 2. An example is given below.

		Weaners and Adults			
			Adults		
	Calves	Weaners	Males	Females	Total W + A
1. Died …….	**X**	**1**	**0**	**0**	**1**
2. Sold …….	**0**	**1**	**1**	**3**	**5**
3. Slaughtered …..	**0**				**0**
4. Donated/gift ...	**1**				**0**
5. Exchanged/lent.	**0**				**0**
6. Stolen……	**1**				**0**

Question 4. Sale outlet

Note that this question applies only to those animals that have been sold within the last 12 months. Ignore any sales that may have occurred more than one year ago. Thus, for example, if animals are usually sold, but there have been no sales within the last year, the answer should be 'No animal sold'.

Question 5. Reasons for culling

Ask an open question, i.e. do not lead the respondent into giving an answer. First ask about reasons for culling/disposing of males, then repeat for females. Then ask respondent to rank from 1 to 3 the reasons that have been given for males, likewise for females. Remind the respondent, at the time of ranking, the reasons that he/she has given for disposal. If only two reasons have been given just rank 1, 2. If more than three reasons have been given leave boxes blank for those reasons not ranked among the top three. An example is given below.

	Males		Females	
1. Size …….				
2. Conformation / shape ….	Y	**1**		
3. Colour …….				
4. Temperament ……..	Y	**2**		
5. Health …….				
6. Body condition ……...				
7. Performance ……			Y	**2**
8. Old age ……...	Y		Y	**3**
9. Poor fertility ……...	Y	**3**	Y	**1**

4.9 Cattle. Breeding (Page 7c)

Question 2. Reasons for choice of bull(s) for breeding

This question should be presented to the respondent in the same manner as Question 5 above on Page 6c, except, of course, that this question pertains just to males. Note that this question and the remaining questions on this page are not to be completed if males are not used for breeding.

Question 4. Source of breed(s) of bull(s) used in the herd

Tick one or more boxes for source of bull. Note that the answer to this question should refer to what has happened during the last 12 months. 'Bull borrowed' can be from anywhere, including neighbour, but the bull must have been brought for a period of time into the herd. 'Communal area bull' means any other bull within the communal area outside the household to which a cow might be mated. In most cases such bulls are likely to be unknown, probably their breed too. If the breed type of the bull is known for any source of bull write the name of the breed. This can be a crossbreed. Use the two 'breed type' columns (see below) if more than one breed type or crossbreed is used.

Leave code boxes blank for either the supervisor or the central coordinating office to complete later. If the bull is a crossbreed numbers should be written in the two boxes for each of the pure breeds from which the bull is derived. However, if this is a genotype that is recognised and maintained as a breed in its own right (see 4.10) it will have its own breed code. The supervisor or central coordinating office should complete the first 'Code' box only for a bull that is a pure breed. See example on the next page.

Tick one or more boxes		Breed type 1 (pure or cross) Common name	Code		Breed type 2 (pure or cross) Common name	Code	
1. Own bull (bred)		_____			_____		
2. Own bull (bought)	**Y**	**Nkone**	**1**		**Nkone x Afrikaner**	**1**	**4**
3. Bull donated		_____			_____		
4. Bull borrowed	**Y**	**Afrikaner**	**4**		_____		
5. A.I.		_____			_____		
6. Communal area bull		_____			_____		

In this example the farmer used two types of breeds of bulls that were bought - Nkone and Nkone x Afrikaner. The codes can be found in Table 8.4 of Chapter 8. Note how these have been coded in the boxes provided. The farmer also borrowed an Afrikaner bull. Once again 'Y' stands for 'tick'.

4.9.1 Sheep and Goats. Breeding (Page 7s and Page 7g)

Question 4. Prolificacy

Ask the respondent to think of the number of lambs or kids that are currently alive in the flock. He/she should ignore any lambs that have died. (Exit information is collected in Question 3 on Page 6s or Page 6g – see 4.8.) Then ask the respondent to say to how many ewes or does these lambs or kids were born. (Of course, for a large flock the respondent may only be able to provide an approximation.) Finally, ask the respondent to divide the number of ewes or does that have had lambs or kids into those that have produced singletons, those that have produced twins, and those that have produced triplets.

4.9.2 Pigs. Breeding (Page 7p)

Question 5. Farrowing interval

Ask the respondent to given an average interval between births of litters for an average sow.

4.9.3 Donkeys. Breeding / working (Page 7d)

Question 5. Use of donkeys for work/draft

Spanning formation 0-0 means 2 donkeys side by side, 0-0-0-0 means 4 donkeys side by side, 0-0 means 4 donkeys in two rows of 2.

0-0 If another formation is used, e.g. 0-0-0, write the answer under 'Other (specify)' using the same method of presentation.

4.10 Cattle. Breed/ age / sex structure (pure breeds) (Page 8c)

Before embarking on the survey decisions will have been taken on who should ultimately be responsible for reporting on breed type - the enumerator or the respondent. For the Zimbabwe survey each enumerator was trained to recognise the different breed types. He or she, in consultation with the respondent, decided on which breed name to write down. For the survey in Ethiopia mentioned earlier, however, less was known

about the different breed types, and breed fact sheets or field guides (see Appendix 3), such as those used during training of enumerators in Zimbabwe (see section 5.2.2 of Chapter 5), did not exist. Enumerators in this case were asked to write down what the respondent told him or her. There was a greater emphasis in this latter survey for recording indigenous knowledge on breed types. Nevertheless, one of the main aims in both surveys was to develop or to improve the breed field guides.

Use Page 8c only for pure breeds. If, however, crossing of two breeds has resulted in a genotype that is recognised and maintained as a breed, then this breed should be counted as a separate breed and included on this form.

Tick the number of pure breeds in the herd in the box at top of this form. The enumerator may need to see the cattle at the household before completing the answer to this question. If the cattle are mixed but some clearly belong to one breed then record these as one breed and the remainder as mixed crosses (Page 9c – see 4.11). Note that page 8c (and 9c) needs to be completed for each pure breed mentioned at the top of page 8c. **Information on all animals in the herd, both pure and mixed breeds, must be included on these forms, otherwise numbers given in Question 3 will not add up to those provided for Question 9 on Page 1c.**.

Form 8c allows for up to two pure breeds to be entered. Fill in the left hand side for breed 1 and the right hand side for breed 2. A third breed can be entered on form 9c.

Question 1. Common breed name

Write down common breed name and local breed name if this is different and is known. Leave breed code box blank to be completed later by supervisor or the central coordinating office.

Question 2. Trend within herd

Ask respondent whether it is planned to increase or decrease the proportion of animals belonging to this breed in the herd, or whether the proportion is expected to remain unchanged.

Question 3. Numbers by age and sex

Enter numbers for each category in the boxes provided. A weaner is an animal that has been weaned but it is not yet a mature adult. Enter X in a box if not known, 0 if the answer is zero. An example is given below. Do not worry if the entries here, when added together for the different breeds or crosses, do not sum to the totals given in the household form (Page 1c, see 4.3). Any discrepancies will be handled later during data analysis. An example is shown below.

Remember to enter the age of the oldest animal. If not known, enter X.

	Calves	Weaners	Adults
Intact male	**1**	**0**	**1**
Castrate	**0**	**1**	**0**
Female	**2**	**2**	**4**

How old is the oldest animal? **X** years

Question 4. Origin/source of breed

Ask the respondent how the household head became owner of this breed. For example, if he/she inherited it when he/she became head of the household then tick ‘Inherited’, even if the breed was originally brought to the household from elsewhere.

Question 5. Quality of traits perceived by owner

This is not an open question. Each question needs to be asked in turn. Once all 13 questions have been asked, remember to ask if there are any other traits that are perceived to be important in the household. If so, specify under 'Other'.

4.11 Cattle. Breed/age/sex structure (mixed crosses) (Page 9c)

4.11.1 Pure breeds

This page allows for a third pure breed to be recorded. If, by chance, there are four or five breeds in the household this and the previous form can still be used for these extra breeds. Just write the information clearly alongside the entries for one of the other three breeds completed on Page 8c or 9c so that it can easily be distinguished from the entries for the other breed – see illustration on next page.

4.11.2 Mixed crosses

Information for mixed crosses is entered on the right hand side of this form.

Question 1. Breed apparently used to produce crosses in herd

Examine the animals and list the breeds that appear to have been used. Enter first the breed that seems to have had the most influence, second the breed that seems to have the next level of influence, and so on. Discuss this assessment with the household head (respondent) to see whether he/she agrees. Write down the common name, and also the local name, if known. Leave breed code boxes blank to be completed later by the supervisor or the central coordinating office.

Question 2. Numbers by age and sex

This question is to be completed in precisely the same way as for pure breeds (Pages 8c/9c – see 4.10, 4.11.1). Remember to distinguish between not known (X) and zero (0).

Question 3. Quality of traits perceived by owner

Ask each question in turn. The respondent will be required to give an answer for each question. In this case the answer provides **an average assessment for his/her mixed herd of animals as a whole**.

Illustration of how a 4th breed can be entered in the questionnaire. Again for 'Y' read 'tick'.

1. Common breed name **Nkone** **Tuli**

Local breed name _____

2. Trend within herd *(tick one)*

Increasing	**Y**		Decreasing	
Stable		**Y**	Unknown	

3. Numbers by age and sex
(enter X in box if not known)

	Calves		Weaners		Adults	
Intact male	**1**	**0**	**0**	**0**	**1**	**0**
Castrate	**0**	**0**	**1**	**0**	**0**	**0**
Female	**1**	**0**	**0**	**0**	**4**	**2**

How old is the oldest animal? **10** years **8**

The data for the Tuli breed (a 4th breed) are entered alongside the boxes. The data for the Nkone breed (one of the first 3 breeds) are contained within the boxes.

4. Origin/source of breed

1. Inherited	**Y**	
2. Communal area farm		* *specify location if known*
3. Commercial farm *		**Y Jackson Farm**
4. Market *		

4.12 Cattle. Phenotypic description (Page 10c)

These details are to be entered for one pure breed only. If more than one pure breed has been entered in Pages 8c and 9c try to chose the breed that is least common in the area. The questions should be answered as carefully as possible. **This form is particularly important because it provides one of the main foci of the survey – namely to characterise the different breeds and their distribution**. The enumerator will be required to use knowledge gained during the training course. If he/she needs to confirm that he/she is making correct judgements regarding size, etc., he/she should check with his/her supervisor.

Question 1. Breed common name
Write down the breed name. Leave the code box blank to be completed later by the supervisor or the central coordinating office.

Question 2. Coat description
Pattern. 'Uniform (multi-coloured)' refers to an animal that has more than one colour appearing as bands from front to back. If the coat pattern varies among animals within the same breed tick more than one box (e.g. 'Uniform (1-colour)', 'Pied').

Question 3. Colour

A colour chart is provided to assist with the answer to this question (Appendix 2). Match the colour(s) of the animals as closely as possible to the colour chart and record the number(s) in the box as provided. Sometimes there may be variations in colour between animals belonging to the same breed. When this is the case complete the first row for the most frequent colour combination possessed by the animals, the second row for the second most frequent colour combination, and so on.

In some cases (e.g. for body) two columns (three columns for chickens) are provided. If an animal is uniform in colour enter the code in the first column only. When an animal is not uniform in colour enter the two colours in the first and second boxes in the same row, with the predominant colour first. Thus, if an animal is black and white, but mainly white, complete the first row as 2 1 (see Appendix 2). Alternatively, if most animals are black but a few are black and white (mostly black), this question would be answered as in the example shown below.

Rank			
1	**1**		← black animals
2	**1**	**2**	← black and white animals
3			
4			
5			

Complete this question separately for body, head, ear tips, tail switch, hoof and muzzle in turn. **Note that colour combinations for groups of animals of the same colour(s) are entered in the same row, not in the same column**. The ranking downwards from 1 to 5 refers to the frequency of animals, from most common to least common, showing the same colour combination.

Question 4. Body size

For this and some of the following questions describe an average adult female and an average adult male. If one sex is not present leave the column for that sex blank. The enumerator should carry a graduated stick that he/she can use to assess body height and length.

Question 5. Dewlap

The enumerator will have learned to judge different sizes during the training course.

Question 6. Hump

The enumerator will use knowledge gained during the training course. He/she should choose a typical male/female.

Question 7. Profile

Sometimes more than one type of face profile will occur. Tick as appropriate.

Question 8. Horns

The shape and orientation of horns may vary from animal to animal. Tick as many boxes as necessary. Use the graduated stick to measure average length.

Question 9. Naval flap

The enumerator should use knowledge gained during the training course.

Question 11. Tail
The enumerator should use knowledge gained during the training workshop to define 'Thickness at base'.

Question 12. Udder
The enumerator should use knowledge gained during the training workshop.

As stated above, this page is particularly important. **The enumerator should, therefore, periodically check with his/her supervisor that he/she is making a correct judgement.**

4.12.1 Sheep, Goats and Donkeys. Phenotypic description (Page 10s, 10g and 10d)

Similar guidelines apply as for cattle. The enumerator will need a graduated stick to determine body height and length.

4.12.2 Pigs. Phenotypic description (Page 10p)

Again similar guidelines apply as for cattle. Distinctions in size will have been taught at the training workshop. The enumerator should periodically check with his/her supervisor if in doubt.

4.12.3 Chickens. Phenotypic description (Page 10ch)

This may be the most difficult of all the forms to complete. Most questions require information on both males and females. If one sex is not present leave boxes for that sex blank.

Question 2. Colour
Boxes for plumage are divided into three columns. As for cattle, complete the first row for the birds showing the most frequent colour combination for the breed being described. Enter up to three colours, the first colour being the most prominent in the bird, the second being the next most prominent and the third the third most prominent colour. Ignore any further colours in birds that have more than three colours. If there are other birds that belong to the same breed being described but differ somewhat in plumage colour pattern, complete the second row etc. Fill in these boxes for both males and females.

4.13 Duties of the supervisor

Before the survey starts the supervisor should ensure that he/she has been given, together with sufficient blank questionnaires for each primary species, the following lists of codes.

1. Districts, wards and villages
2. Supervisors and enumerators
3. Tribes (possibly)
4. Breeds (possibly)

Each enumerator will also need a colour chart. It will also be useful, if sufficient breed fact sheets area available (see Appendix 3), for each district (or provincial) supervisor to have one for reference purposes during the survey.

It will have been decided at the start of the survey whether coding for tribes and/or breeds should be done by the supervisor or left for the central coordinating office to complete later. Districts and wards will already have been identified and coded. It will be the responsibility of the supervisor to randomly select the villages to be sampled from each ward and give them code numbers. For each ward the villages can be numbered 1,2 or given any other number that the supervisor chooses

Check each questionnaire after completion by the enumerator. **From time to time read through these guidelines to remind himself /herself on how questions should be answered.** He/she should periodically discuss with the enumerator any difficulties he/she might be having in completing the questionnaires. Explain to the enumerator those questions that he feels the enumerator may not be completing satisfactorily. In particular he should pay attention to the following pages.

4.13.1 Title page.

Ensure that the enumerator has lists of codes for enumerator and supervisor, for each administrative layer and for each household. Alternatively, the supervisor may wish to complete this page before giving the questionnaire to the enumerator.

4.13.2 Health (Pages 4 and 5).

Check that the answers to these questions are sensible and that all appropriate boxes have been completed. Do not, however, enter disease or treatment codes. This will be done by the central co-ordinating office.

4.13.3 Castration / entries / exits / culling (Page 6)

Verify that the enumerator is answering Question 2 and 3 correctly and the answers match the guidelines given in 4.8.

4.13.4 Breeding (Page 7)

If required, insert breed codes for any breeds described in Question 5. If a breed has not been defined in the list of breeds provided, leave the code box blank.

4.13.5 Breed / age / sex structure (Pages 8 and 9)

Again, if required, code for breeds, both for pure breeds at top of page and for Question 1 for mixed breeds.

4.13.6 Phenotypic description (Page 10)

Pay particular attention to these forms. Make sure that they are being completed correctly and that, whenever a pure breed has been specified, this page has been filled in for one of the breeds. If required, enter code number for this breed.

In the Zimbabwe survey it was decided to code breeds at the central coordinating office at Matopos Research Station. At the start of a livestock breed survey it is important to establish who is to have the responsibility of breed coding, the district supervisor or the central coordinating office.

CHAPTER 5

Enumerator selection, training and supervision

The success of a FAnGR survey largely depends on the quality of the enumerators and their supervisors. A good survey schedule, well designed questionnaire, subsequent analysis and presentation of results cannot compensate for mistakes made by the enumerators. It is therefore clear that enumerator selection and training has an important influence on the quality of a survey. Most enumerators will be local extension staff. They have the advantage that they are likely to have good local knowledge of the farming systems, the livestock kept and the local culture. Researchers or students, however, can also be recruited. The latter are likely to be enthusiastic and keen but will require more supervision and attention.

5.1 Enumerators

Enumerator selection is important. Good enumerators have special qualities which should be taken into account in their choice. It is advisable to identify more enumerators for training than will be actually needed for the survey in case of drop-outs or sickness. The qualities possessed by a good enumerator are listed here.

5.1.1 Personality

Enumerators need to have a friendly, outgoing personality. They must have a habit of working hard and be prepared to travel under unfavourable weather and transport conditions. They must be patient, tactful, open-minded and sympathetic towards the farmer's problems, and, since no two farmers are the same, they need to be flexible.

5.1.2 Local knowledge

Enumerators need to have knowledge of farming and must know fairly well the locality where they will be working, the farm conditions and farming practices. For this reason, use of grass-roots extension personnel in the locations in which they work, or have previously worked, has a special advantage. They should have some familiarity with the different breeds of livestock in the locality. They should also be familiar with local idioms, units of measurement, etc., and with the local customary laws and culture. Enumerators need also to be fluent in the local language so that respondents feel confident in expressing themselves, especially when they may have a limited formal education.

5.1.3 Education

Enumerators should have an adequate level of education to be able to complete the questionnaire without difficulty, be able to do simple arithmetic calculations in order to

check whether the answers being given to certain questions seem sensible, and be able to take body measurements of animals. For example, an enumerator should be able to see at a glance from the answers given on Page 6 of the questionnaire for numbers of entries for weaners and male and female adults (see section 4.8 of the previous chapter) whether they add up to the total. Likewise, from the definition of the wealth category to which a household has been assigned, an enumerator should know whether the livestock numbers given on Page 1 (see section 4.3) seem reasonable. A good enumerator with a reasonable level of education should be able to extract the key elements relevant to a particular question, especially when the respondent is not specific or to the point.

5.1.4 Motivation and honesty

Being honest and motivated to do the job are prerequisites. Poorly motivated enumerators may either quit the survey halfway through or even attempt to falsify the data. For this reason it is important to involve enumerators as early as possible in the planning stages and to train them well.

5.1.5 Racial and ethnic background

This is relevant in some societies and depends on historical development. Enumerators from the same ethnic group as the householders may find it easier to adopt the 'right language' and to adhere to the local customs and practices in approaching and interacting with the households.

5.2 Enumerator training

Good training of the enumerator and his/her supervisor is a key to the success of the survey. The enumerator must know how to use the questionnaire well so that he/she makes few mistakes. A good team of enumerators who are well trained will administer the questionnaires uniformly.

There are five major objectives in training enumerators:

- To provide them with an orientation.
- To instruct on the business of interviewing.
- To familiarise them with the questionnaire.
- To practise using the questionnaire.
- To give them practical exposure to different breeds of livestock.

5.2.1 Orientation

This is provided by describing in detail the purpose and objective of the survey. The scope of the survey should be described to the enumerators and supervisors in terms of the areas and farming systems being studied, and the social and institutional structures available, including the local authorities in the areas where the enumerators will work. A background to how the survey has been planned, i.e. how villages and households have been selected and numbers of farmers/villages that will partake in the survey, must be explained. The enumerator needs to know beforehand what logistical support can be

expected and also the mode of payment, the time available for organising visits to households, etc.

5.2.2 Questionnaire familiarity

It is important to make sure that the enumerators understand all the questions contained in the questionnaire. Enumerators need to have clear and consistent views on what information is needed, what interpretations of questions are expected, how questions should be asked, and how and where to record the answers on the page.

A good way to start this familiarisation during the training is to involve both enumerator and trainer together in an interview with the trainer doubling up as the respondent. The trainer can start by explaining the intention of a question and the type of answer expected. The enumerator then phrases the question in the local language. The trainer can then provide a hypothetical answer and request the enumerator to record it. As the trainer goes through the questionnaire the enumerator should write notes in a note book. These might be useful for reference during the survey.

During this process the trainer should concentrate on the translation of questions and the use of local idioms and phrases to ensure that all enumerators use the same terminologies. He/she should also ensure that there is consistent handling of questions in the questionnaire and interpretation of the explanations of the instructions alongside them. A breed fact sheet (or field guide), as illustrated in Appendix 3, is of particular value in the training course as it helps the course participants to familiarise themselves with the main breeds in the region. Finally, the trainer should make sure that methods for making measurements on animals, both quantitative and qualitative, are clearly defined so that consistency of recording can be achieved in the survey itself. Adequate time needs to be given to the difficult areas of the questionnaire, e.g. phenotypic descriptors, prolificacy, laying cycle and farm size and crop acreage, for example, to ensure that the participants fully understand the questions. Time also needs to be spent explaining how to approach certain questions in order to ensure that unbiased, objective answers are given. It is important that the enumerator does not force the respondent into providing an answer that may not be the correct one.

Guidelines are provided (Chapter 4) to assist the enumerator in understanding how to complete the questions. Chapter 4 should be available in booklet form at the time of training, and each enumerator should be encouraged to regularly check his copy during the course of the survey, in order to refresh his/her mind in the understanding of the questions and how to answer them correctly.

5.2.3 Practicals

There must be plenty of opportunities for practical work during a training workshop, both in interviewing farmers and filling in the questionnaires and in practising the recording of phenotypic characteristics. A variety of livestock needs to be available on which enumerators can practise. Ideally, a training workshop should last five days to provide ample opportunity for group discussions and practical training. This need was also identified during the FAnGR survey undertaken in Ethiopia. The time-table planned for Phase 2 of the Zimbabwe survey is shown in Table 5.1. Unfortunately, time factors restricted the training to three days and the programme had to be condensed.

It is important to note that the planned programme included time on the first day to discuss the aims and structure of the survey. This is important to ensure that both

supervisors and enumerators have a clear understanding of the structure of the sampling frame. Table 5.1 shows the lengths of time allowed for discussions and practicals.

Table 5.1. *The programme for the training course for enumerators and supervisors planned for Phase 2 of the survey in Zimbabwe.*

Monday	
08.30 - 9.00	Welcome, project background and objectives.
09.00 - 10.00	Zimbabwe Survey Phase 2 implementation.
10.00 - 10.30	Tea.
10.30 - 11.30	Steps in developing a sampling frame – summary guidelines.
11.30 - 12.30	Sampling frame for the Zimbabwe Survey Phase 2. Sampling sites selected for Manicaland, Mashonaland West, Masvingo and Midlands provinces.
12.30 - 14.00	Lunch.
14.00 - 14.30	Reports from Agritex on available baseline information.
14.30 - 15.00	Discussion.
15.00 - 16.00	Working groups to discuss implementation of survey design in individual provinces.
16.00 - 16.30	Tea.
16.30 - 17.30	Report back to plenary session.
Tuesday	
08.00 - 10.00	Questionnaire design and content overview for the Zimbabwe Survey.
10.00 - 10.30	Tea.
10.30 - 12.30	Working groups to discuss the questionnaires.
12.30 - 14.00	Lunch.
14.00 - 15.00	Report back to plenary session.
15.00 - 15.30	Tea.
15.30 - 16.30	Breed fact sheets – guidelines on phenotypic characterisation.
16.30 - 17.30	Group work on breed fact sheets.
17.30 - 18.30	Report back to plenary session.
Wednesday	
08.30 - 10.30	Phenotypic characterisation practicals.
10.30 - 11.00	Tea.
11.00 - 12.30	Phenotypic characterisation practicals.
12.30 - 14.00	Lunch.
14.00 - 15.00	Working groups on phenotypic characterisation practicals.
15.00 - 16.30	Report back to plenary session.
16.30 - 17.30	Interviewing techniques.
Thursday	
08.00	Depart for communal area for mock survey practicals.
13.00 - 14.00	Lunch.
14.00	Return to Matopos Research Station.
15.00 - 15.30	Tea.
15.30 - 17.30	Report back to plenary session.
Friday	
08.30 - 09.30	Guidelines for completing questionnaires.
09.30 - 10.00	Survey administration: supervision and organisation issues.
10.00 - 10.30	Tea.
10.30 - 11.00	Coding for questionnaires: provinces, districts, wards, villages, households, supervisors and enumerators etc.
11.00 - 11.30	Logistics.
11.30 - 12.00	Budgets issues.
12.00 - 13.00	Summary and conclusions.
13.00 - 14.00	Lunch and departure.

5.3 Supervisors

Adequate field supervision is important. Effective supervision allows for collection of good quality information. It is also important that supervisors undertake the same fieldwork at appropriate times so that they are in a position to appreciate any difficulties the enumerators experience in their work. Maintaining contact with enumerators while they are in the field is also important as it allows early clarification of the problems that may be encountered. Available methods of communication need to be discussed before the survey starts. Supervisors therefore need to attend the training workshop along with the enumerators. Trainers can also be involved in supervision.

Since in most provinces in Zimbabwe the survey was conducted by village within ward, and by district within province, a provincial supervisor was appointed for each province and, reporting to him, a district supervisor for each of the three districts sampled. Each district supervisor had two enumerators to cover the three wards to be sampled. In total, this involved the equivalent of eight provincial supervisors, 24 district supervisors and 48 enumerators. Since the survey was conducted in two phases the training was done separately for each phase. This was a manageable number for training. The training was done at Matopos Research Station where there were good facilities for the practical sessions.

5.4 Trainers

A trainer is responsible for creating the learning environment and maintaining the flow of information to the participants attending a training workshop. At the same time he/she must be aware of the participants' needs and be sensitive to their concerns. A trainer preferably needs to have had experience in conducting surveys. He/she also needs to have had practice in teaching during his/her career. Thus a mix of university lecturers and field research scientists could make a useful training team. The second training workshop conducted prior to Phase 2 of the Zimbabwe survey was rated highly by the participants. This was partly because the trainers were more confident, having already conducted Phase 1 of the survey, and their enthusiasm came through. Below, in brief, are a few tips for a successful training workshop.

- Plan ahead and be well prepared. Begin each working day presenting the schedule for the day, the objectives and a summary of what participants are expected to learn.
- Manage time wisely. Time is a motivating factor in training. When sessions drag the participants lose interest. Keep to the planned time-table.
- Keep presentations to a minimum. Encourage participants to speak up and participate actively in discussions and exercises.
- Include as many practical exercises and group discussions as possible. Use different techniques and try to promote active participation. Make sure that group activities are used to encourage participation. In managing group presentations to the class make sure that they are focused, to the point and not repetitive.
- Do not let one's personal interest and willingness to teach diminish. Show care for the participants' learning and be patient. Be an attentive and good listener. The participants expect their ideas to be valued. Such positive attitudes will increase credibility among them.

- Praise trainees for their efforts and good performance. This shows recognition and consequently increases their level of motivation. Ask for their feedback at the end of the course.

5.5 Interviewing techniques

There is a skill in interviewing in order to obtain sound and correct answers. Ample time needs to be made available to practise interviewing techniques during a training workshop.

It is important that the enumerator relates well with the household head or his/her deputy in order both to obtain the desired information and to maintain the dignity of the respondent and that of the enumerator. Some guidelines towards achieving good interviewing techniques are give here. The interviewing process is an important task, and the quality of the information obtained is important for the outcome of the survey.

5.5.1 Local practices

Familiarisation with the customs of the area is important, also an adequate knowledge of the local language and any other peculiarities of the area. Local practices, concerned with such aspects as greeting, sitting arrangements, gender roles or interactions, dress and how to respond to offers of food, should be known. For example, it would be frowned upon in some cultures if a female enumerator were to wear trousers. Words may have different meanings in different dialects of a language. An awareness of these helps to avoid using words which may be offensive. Problems may also arise when discussing units of measure. It may be necessary to use terms that are different from the conventional, and then to do a quick conversion before writing down an answer (e.g. information on distance to watering point on Page 3 of the questionnaire (see section 4.5 of previous chapter) may be better obtained by asking the respondent to relate the distance to some object on the landscape).

Topics apart from those directly relating to the questionnaire may arise during the interview. It is good to know what the topical issues are in the general locality. Some of these may be of concern to the farmer and sensitive at the same time. These issues need to be handled tactfully.

5.5.2 Initial contact

In many cases it is not only helpful but essential to make prior contact with the community in the village before the interviews are carried out in order to create awareness among households that a survey is to be undertaken. This may have already been achieved in the conducting of a pre-survey (see section 2.3.5 of Chapter 2). Proper protocol must be followed in appraising the community about the intentions of the survey.

5.5.3 Timing and place of interview

Interviews must take place at a time which is convenient for the household. It is preferable that the interview is held with a household head himself/herself. Sometimes, however, the household head may need to appoint a deputy. The length of an interview will generally not be much more than one hour but more time may be needed for

recording phenotypic details of the animals. An interview should not interfere with important farm operations; the enumerator needs to have the respondent's full attention. The actual place where the interview takes place may have a bearing on the outcome. Interviews may take place at the house, but at some stage the animals will need to be seen. The enumerator must make a judgement of where the best place is because it is important that the respondent is at ease.

A survey should avoid situations when there is a high demand on the farmer's time. Thus, the best time is during the dry season when all crops have been harvested. The enumerator needs to be particularly tactful, therefore, if the survey continues into the wet season. This happened during Phase 1 of the Zimbabwe survey and as a result, the task was made more difficult for the enumerators. This occurred for reasons beyond the organisers' control but the quality of the results may have been impaired. Special note should be taken of days observed in the community – market days, special rest days or religious days - and interviews should be arranged accordingly.

5.5.4 Arrival

A homestead should be approached courteously and the head of the household and all those present, including children, greeted according to the local custom. Even if the enumerator falters, an honest attempt will be appreciated. A friendly and accommodating manner shows the head of the household that he or she is important and respected. The enumerator should introduce himself/herself and explain where he/she is from and why he/she is there. This initial meeting should be used to establish a rapport with the household members and to reduce any anxieties they might have.

The overall objectives and importance of the survey must be carefully explained. Farmers are usually the subjects of many surveys and so they need to know how the community will benefit from the survey. The enumerator needs to explain how the information to be collected will be used and how this could benefit the farmer and the wider community. The direct benefits to the farmer of a FAnGR survey may not be very tangible and therefore the enumerator must not promise too much. The respondent must be assured that the information he or she gives is valued and will be used correctly for the intended purpose. Farmers are afraid of negative repercussions, particularly when there is an uncertainty in terms of the political situation in the region or when they feel that there may be possible tax implications to the answers they may give. It is therefore important that the respondent is convinced of confidentiality; otherwise he or she may not only hide information and but also underestimate the numbers of livestock in the household. The enumerator should explain how the interview will be conducted and give an overview of the content. The enumerator should encourage the respondent to express him/herself, emphasising that he/she is there to learn from the knowledge and expertise of the household.

5.5.5 Getting reliable answers

Questions should be asked in a manner that is easy for the respondent to understand and, if necessary, in his/her local language. After posing a question, it is essential that the respondent is given enough time to respond. If there is a problem with a question, the enumerator should try to rephrase it. Sometimes a question can be left and dealt with later in conjunction with a related one. The respondent must not be rushed. Indications of being impatient or being in a hurry will make him/her uneasy, and he/she will not be able to respond effectively. It is important for the enumerator to remain alert,

to tactfully keep the respondent on track, and not to suggest answers but to get the respondent's own views. If the respondent has difficulty in answering a question the question should be phrased in an alternative way. Questions should not be asked for which answers have already been given (e.g. as part of, or introduction to, another question).

5.5.6 Duration of interview

The interview should last for approximately one hour and not more than one and a half hours. Extra time may be needed though to collect phenotypic details of the animals. The enumerator should monitor how the interview is going. If the respondent becomes restless or shows signs of tiredness the enumerator should consider terminating the interview at the next suitable opportunity. The goal is to collect information on one primary species and two secondary species but is better to cut the interview short and leave one secondary species out rather than allow the interview to drag on.

5.5.7 Conclusion of the interview

The enumerator should quickly check the questionnaire to make sure that all necessary questions have been covered, and thank the respondent for sparing time for the interview. It is helpful for the enumerator to inform the household where he or she is going to next in case something is left behind. It may also be necessary to return to the household later. For example, the animals may have been let out and the enumerator will need to return to see them. A time for this should be arranged before departing. The household may well wish to offer a gift. The enumerator needs to be aware of acceptable norms for receiving gifts and, where necessary, to be polite in declining a present.

It is important that the enumerator keeps a field book that can be used as a diary to include time, date and place of each interview and how long the interview took. At the end of an interview the enumerator should also note in his field book any problems that may have arisen during the interview for later discussion with the supervisor.

CHAPTER 6

Lessons learned from the Zimbabwe survey

It is of value to review the lessons learned from the Zimbabwe survey. The points made here should not be taken too negatively, because despite various problems encountered during the planning and execution of the survey, valuable results have been obtained as illustrated by tables shown in Chapters 9 and 10. The purpose of this chapter is to illustrate some of the difficulties that arose as they will help coordinators of future surveys in other countries.

6.1 Planning

It is essential that ample time is made available for planning a FAnGR survey including the development of an appropriate sampling frame to meet the needs of the survey. The execution of the survey in Zimbabwe proved to be more difficult than anticipated. This was due to interruptions in planning, partly brought about by the slow disbursement of funds and partly owing to difficulties during the period leading up to parliamentary elections. The time frame for the survey is shown in Table 6.1.

Table 6.1. *Time frame for implementation of Zimbabwe survey.*

2000	
February	Preliminary meeting of stakeholders and partners.
March-May	Development of questionnaires.
July	Pre-testing of questionnaires.
August	Selection of wards from four provinces for Phase 1 of survey; revision of questionnaires.
September	Training of enumerators for Phase 1.
October-November	Execution of Phase 1.
December-January	Data entry for Phase 1.
2001	
February	Workshop for SADC countries. [a]
March-April	Revision of questionnaires.
June	Selection of wards from remaining 4 provinces for Phase 2; training of enumerators.
July-September	Execution of Phase 2.
November	Preliminary analysis of Phase 1.
2002	
January-April	Data entry of Phase 2 and verification of data entry for Phase 1.

[a] The experiences gained by the participants in Phase 1 of the Zimbabwe survey were reported at this workshop to representatives from other SADC countries. This information was used for the planning of similar surveys in these other countries.

It is recommended that six months be set aside, from when funds are available, for planning the survey. This should include the seeking of cooperation of partners, meeting with stakeholders, planning how the survey will be executed, and by whom, making sure that everyone is clear on the financial arrangements, organising a sampling frame, selecting sample units and, finally, planning for training.

Many difficulties were experienced during the execution of the Zimbabwe survey with problems in communication, e.g. telephones and radios sometimes not working and a number of poor roads. Earlier discussions with supervisors could have resulted in some of the problems being anticipated and possible steps being taken to alleviate them. Good communication between enumerator and supervisor is essential so that the supervisor can monitor progress and the enumerator can bring up problems as they arise. Suitable vehicles (e.g. those with 4-wheel drive) need to be available.

As already mentioned, it is important, early in the planning phase, to identify the key institutions/partners to be involved in the execution of the survey. In Zimbabwe these were the University of Zimbabwe (Department of Animal Science), Department of Research and Specialist Services (Matopos Research Station) and Agritex, the national agricultural extension service. Agritex provided supervisors at the provincial and district levels in six of the eight provinces and also many of the enumerators. Other enumerators were technical assistants from Matopos Research Station and post-graduate students from the University of Zimbabwe. Appropriately qualified enumerators are the key to the success of a FAnGR survey and need to be carefully chosen. Agritex did not have sufficient staff for the survey in the provinces of Matebeleland North and Matebeleland South and so Matopos Research Station took charge of the execution of the surveys in these provinces.

The numbers of personnel involved in the execution of the surveys in the other six provinces were: provincial supervisors (6), district supervisors (18) and two enumerators per district (total 36). Thus, each pair of enumerators interviewed approximately 108 households across the six villages sampled in a district. Three senior staff from Matopos Research Station shared the two Matebeleland provinces and each took four enumerators with them. Three teams of enumerators, each led by one of the senior staff, travelled across the two provinces from village to village. The numbers of personnel used for the survey proved to be satisfactory.

6.2 Training

Sound training of enumerators is essential and this must be both practical and field oriented with opportunities for phenotypic description and interview practice. It is recommended that five days be allowed for this. Training for each of the phases of the survey in Zimbabwe lasted three days. The quality of the training was much better in Phase 2 than Phase 1 of the survey, primarily due to the trainers being more experienced by this time, already having been exposed to the problems encountered in Phase 1. Nevertheless, three days was probably too short and, especially in Phase 1, enumerators experienced problems in the field that might have been prevented had more time been allowed for training. Examples of problems encountered during the execution of the survey were: (i) disagreements between farmer and enumerator over breed identification; (ii) lack of appreciation of sensitive issues, e.g. introduction of dipping fees, destocking, promised but not delivered irrigation schemes, grain loan schemes, etc.; (iii) difficulties in handling certain questions, e.g. prolificacy and farrowing interval.

Improvements in the questionnaires used for Phase 2, together with better training, substantially reduced these problems. Both supervisors and enumerators need to attend the training course for the survey and time should be made available for potential problems to be aired during the training. The training period needs to be viewed as the platform on which teamwork is developed. Good teamwork is essential for good field work. Finally, the training needs to be held close to the start of the survey, say within 14 days, to ensure that motivation is maintained and the material remains fresh in the minds of the enumerators.

6.3 Timing of survey

The survey should take place during the dry season. Phase 1 of the Zimbabwe survey did not start until the middle of October (Table 6.1) and coincided with the beginning of planting at the commencement of rains. This had not been intended. The planning had been delayed partly because of political tension in the country earlier in the year and partly due to slow disbursement of funds. The second phase of the survey unfortunately coincided with resettlement exercises in some parts of the country and this meant that Agritex staff were restricted in the amount of time that they could put into the survey. In conducting a FAnGR survey there will be various external factors that will influence the results and be beyond the control of the organisers. One just has to do the best one can under such circumstances.

6.4 Questionnaires

Generally, enumerators found the questionnaire forms easy to complete. Nevertheless, the quality of recording was variable. A few difficulties might have been prevented through more thorough training, especially for Phase 1. Questionnaires were pre-tested in July 2000 (Table 6.1) in two villages prior to Phase 1, each village being in a different province. As a result various modifications were made to the questionnaires. The amount of pre-testing was probably insufficient as further modifications were found to be necessary following Phase 1 of the survey. The questionnaires provided in Appendix 1 are those used for Phase 2 and the ones used by other SADC countries. These were found to be satisfactory.

Enumerators did not always complete details for three species. Sometimes this will have been due to interviews becoming rather long. Nevertheless, feed back on the reasons for this would have been useful. Interviews generally lasted about one to one and a half hours. However, enumerators often found that animals were not in their kraals when they visited the household for the interview and they had to return later.

Sometimes enumerators ran short of questionnaires, particularly for cattle or chickens as the primary species. This type of problem needs to be anticipated at the planning stage.

6.5 Colour chart

The colour chart (see Appendix 2) was found to be useful, although enumerators said that they were not always able to match colours to animals. A few more colours were added to the colour chart for Phase 2 in an attempt to fill some gaps. There was

sometimes confusion in filling in the correct boxes in the questionnaire to describe the colours. Because of variations in colour shades produced on different computer printers all colour charts, both for Zimbabwe and for some of the other SADC countries in which the surveys were conducted, were produced at ILRI. This is an important point to note for other potential users of this survey system. A colour chart must be produced centrally, checked to ensure that the colours printed match reasonably those shown in Appendix 2, and copies distributed to the survey teams throughout the country.

6.6 Coding

At the beginning of the survey in Zimbabwe it was anticipated that provincial and district supervisors would handle all coding. It was later realised that it would be difficult to provide codes for all the diseases, treatments and breeds that enumerators might come across. It was decided, therefore, that all coding for these three items should be done at Matopos Research Station on receipt of the questionnaires. It is recommended that this should be the general approach for such surveys. Supervisors in the field were responsible for ensuring that the coding for themselves and for the enumerators, provinces, districts, villages, households and tribes was done correctly. The relevant codes were provided to them before the survey started.

6.7 Pre-survey information

Prior to the selection of households to be sampled in a village it was decided to do a pre-survey of the village to determine the numbers of households with livestock (at least cattle, sheep or goats) and to characterise them into 'rich', 'medium' and 'poor' households. This is an important requirement of a survey where a census of households is unavailable. It also provided the opportunity to hold pre-survey meetings with the community leadership. This is crucial to ensuring the smooth running of the survey.

The numbers of households in the village are the key to the estimation of populations of livestock numbers and this was not fully appreciated by the institutions involved in the survey in Zimbabwe. Lists of households written down for each village were not always filed in the district or provincial office, and, since Agritex staff were subsequently busy in resettlement activities, there was a delay in obtaining this information. Whilst it was fairly easy to rank a household on the basis of its wealth status, it had not been appreciated that in some villages the numbers of households in each 'wealth' group would differ. It had been decided to select six households from each wealth group. In retrospect it might have been preferable to sample households in proportion to the size of wealth group in order to obtain a more precise population estimate (see section 2.3.5 of Chapter 2). The final analysis of results from the survey in Zimbabwe will give further guidelines on optimal choices of households to achieve the most precise population estimates possible in future studies.

6.8 Supervision

Strict supervision is necessary, both by provincial and district supervisors and by the institutions directing the survey. Thus, staff from the University of Zimbabwe and Matopos Research Station visited once each district being surveyed. More frequent

visits would have been beneficial but were limited by funding. Indeed, various problems were identified at each visit that could have benefited from a follow-up. Frequent meetings between supervisors and enumerators are needed to ensure that questionnaires are completed correctly and problems discussed. The efficiency with which this was done and questionnaires checked varied from district to district. This was to be expected and reflected the relative enthusiasms of different supervisors and their teams.

6.9 Funding, costs and payments

The Zimbabwe survey succeeded in being undertaken cheaply, principally because the various partners were resourceful in their use of the available funds. The shortage of funding will have had some impact on the general quality of the information obtained. For instance, the few numbers of wards sampled per survey may have limited the scope of the survey. In addition, enumerators need to be adequately paid and their supervisors given incentives to participate well. There was no budget for pre-surveys and this increased the strain on available resources.

The costs involved in undertaking a livestock breed survey will vary from country to country. Thus the costs involved in each activity in Zimbabwe may be different from those that might be anticipated in another country. Rather than provide a breakdown by cost, therefore, we give in Table 6.2 a list of the various items that need to be catered for in anticipating the costs of a survey. Daily allowances to enumerators and supervisors accumulate rapidly and these need to be carefully calculated. Daily allowances may also need to be paid to data entry people if they have to be hired. Issues of transport need to be carefully considered. Depending on the types of terrain, ease of access to villages and the conditions of roads, a sum may need to be set aside for vehicle maintenance and repair. Finally it should be noted that the costs of printing of questionnaires will not be insignificant. A thorough review of the expenses likely to be encountered, and appropriate allocation of the budget to cover each activity, needs to be determined at the preliminary meetings (see Table 6.2).

Farmers also expected some material compensation. In the Zimbabwe survey some enumerators ended up making false promises. It is important that farmers are told what findings are expected from a survey. In a survey such as this where the direct benefits to an individual farmer are difficult to quantify, it is necessary for enumerators to be told at the beginning what the expected outcomes might be and how these might benefit farmers in general. This may improve cooperation by farmers and eliminate the need for material promises that may never be fulfilled.

6.10 Data analysis

A final lesson learned by the partners was that it was easy to neglect the importance of data analysis as a component of a FAnGR survey. Indeed, the time needed for computer data entry and data analysis was underestimated. One member of staff from the University of Zimbabwe and one from Matopos Research Station spent three weeks at ILRI in November 2001 (see Table 6.1) to learn the approaches to data analysis. During this period the various outputs described in Chapter 10 were prepared. Certainly, neither the data skills that are needed for entering, managing and analysing the data, nor the time involved, should be underestimated.

Table 6.2. *Survey requirements, tasks, costs and expenses.*

1. Preliminary meetings.
   Definition of objectives, selection of species to be covered, identification of collaborators, documentation of sources of ancillary population statistics, review of questionnaire, allocation of budget, arranging programme and list of participants for preparatory workshop.
2. Preparatory workshop.
   Creation of awareness among stakeholders, discussion of implementation issues with provincial/district officials, such as needs for transport, accommodation, meals, daily allowance etc.
3. Planning - survey design.
   Development and documentation of sampling frame, organisation of survey teams, planning of timing for survey execution, making arrangements for computer data entry, database administration and analysis, redesigning of questionnaires (if necessary), documentation of revisions to Breedsurv computer system (if necessary), preparation of codes for use in data recording, preparation of breed fact sheets for main breeds.
4. Pre-surveys (if necessary)
   Creation of awareness and promises of cooperation in villages to be included in the survey, preparation of lists of households with livestock, evaluation of resources needed, accommodation, meals, daily allowances, transport for enumerators and district supervisors.
5. Pilot surveys - pre-testing of questionnaires (if necessary).
   Accommodation, meals, daily allowances, transport for enumerators and national supervisors from central coordinating office, short training session (see point 6.)
6. Survey materials.
   Finalising questionnaires and printing of questionnaires, colour charts, coding sheets for supervisors/enumerators, materials for enumerators (measuring tape/sticks, writing materials, bags for questionnaires), breed fact sheets.
7. Training.
   Preparation and printing of training materials, accommodation for participants and trainers, meals, daily allowances, transport.
8. Main survey.
   Accommodation, meals, daily allowances, transport for enumerators, district and national supervisors, as appropriate, costs of vehicle maintenance and repair, fuel.
9. Database management, data coding, data entry and verification.
   Computer system modifications (if necessary), installation and testing of computer system, data entry allowances, computer expenses, ensuring adequate number of computers.
10. Data analysis
    Data analysis expenses, preparation and printing of report.
11. Report-back workshop.
    Meeting materials, accommodation, meals, daily allowances, transport for delegates.

6.11 Major things to watch

To summarise some of the points outlined in this chapter:

- Allow plenty of time for planning, both for the execution of the survey and the design of a sampling frame. Decide early the roles to be played by the different partners and build collaborative teams.
- Allow five days for training. The training should include a significant amount of time for practical work (e.g. mock interviews, livestock characterisation).
- Plan for the undertaking of pre-surveys to count numbers of households with livestock, and document the information obtained.
- Emphasise the need for regular supervision at all levels throughout the survey.
- Do not ignore the needs and time required for data entry and analysis. Build this into the time-frame for the survey during the planning phase.

6.12 Summary of steps in a FAnGR survey

Finally it may be helpful to summarise once again the steps involved in the execution of a FAnGR survey and to give an appropriate time-scale for the planning, execution and data analysis phases (Table 6.3). Some of these have already been described in Table 6.2 to assist in determining the expenses associated with each activity. A six-month period is suggested for planning the survey (which itself could last about three months depending on the size of the field team and the extent of the survey) and up to 18 months for data entry, analysis and reporting. It is possible that the final report can be achieved in less than 18 months but the size of this task should not be underestimated. To keep stakeholders informed it may be helpful to provide progress reports at specified intervals.

Table 6.3. *Steps required for the execution of a FAnGR survey.*

Planning (6 months)	1. Develop institutional collaborations and define respective roles. 2. Determine how survey is to be conducted, areas to be surveyed and the survey teams that need to be put in place. 3. Define sampling frame. 4. Determine which species are to be studied. 5. Produce suitable questionnaires from those used in Zimbabwe. 6. Make sufficient copies of the questionnaire and colour charts for supervisors and enumerators. 7. Select sampling units (at province, district and ward level). The assistance of a statistician could be invaluable here. 8. Identify supervisors for execution of survey. 9. Select (through supervisors) enumerators. 10. Make sure that budget can meet necessary expenses and that procedures are in place for payment of supervisors and enumerators. 11. Organise availability of data entry personnel and a database supervisor ; plan how the data analysis is to be done. 12. Ensure that adequate computing facilities are available.
Field survey (3 months)	1. Conduct training course. 2. Make sure that each member of survey team understands his/her role. 3. Conduct village pre-surveys, if necessary, to collect data on numbers of households (with cattle, sheep and/or goats) and assign them to different wealth groups. 4. Select households to be interviewed. 5. Conduct interviews. 6. Hold meetings at regular intervals between enumerators, supervisors and central coordinators. 7. Supervisors to check questionnaires and to ensure that appropriate coding is done. 8. At end of field work return completed questionnaires to central coordinating office.
Computer data entry/analysis (12 - 18 months)[a]	1. Code data for breeds, diseases and treatment. 2. Load data base system into computers. 3. Enter data into computers. 4. Data entry supervisor to check queries. 5. Update data files with answers to queries. 6. Verify data. 7. Undertake data analysis. 8. Write reports.

[a] The process of data entry (steps 1-6) is described in detail in Chapter 8.

CHAPTER 7

Breedsurv - computer data capture and storage system

7.1 Construction of Breedsurv

A computer data capture and storage system, Breedsurv, is provided to hold the data collected in the questionnaires. It has been designed so that the data entry screens match as closely as possible the formats of the questionnaires. It also contains a number of data validation checks (based on 'acceptable' versus 'unacceptable' values) to prevent some erroneous data from being entered. The system has been designed with user friendliness in mind and to simplify data entry. It has also been organised in such a way that the system can be easily modified to suit different situations. For example, a country may be interested in surveying only a subset of those species studied in Zimbabwe, either as primary or secondary species, or in designing a survey with just some of the questionnaire pages. Breedsurv should be able to accommodate this. Furthermore, a competent Access user, who can alter the contents of Access tables and the corresponding data entry screens described in this chapter, may delete or add variables without needing to understand the general structure and linkages within the Breedsurv system itself.

The data are stored in a number of files (or 'tables' as defined in Access) as illustrated in Fig. 7.1. It is important for the user to appreciate how the data are stored as this influences the way that data are retrieved (see Chapter 9) and the statistical analysis done (see Chapter 10). Thus, the data on Production system (Pages 2c and 3c for the cattle questionnaire), on Health (Pages 4c, 5c), on Castration/entries/exits/culling and breeding (Pages 6c, 7c) and on Breed/age/sex/structure (Pages 8c, 9c) (see Appendix 1) are each stored in a separate file for each species. Whether the source of data for a particular species is as a primary or secondary species, data for both primary and secondary species (Pages 8, 9) are stored together in the same files. Phenotypic description data (Page 10c) are also contained within the breed/age/sex/structure files (PHENCAT, PHENSHP etc. – see Fig 7.1). Note, however, that phenotypic data are not always collected. When this is so, the fields in these files that contain the phenotypic data are left blank.

Each of the above files are linked to the HOUSEHOLD file which contains data recorded on the title page of the questionnaire and the general information recorded on the Household page (Page 1c). Ward, village and household numbers are defined as index variables which provide the links between the household file and the other files. Thus, the combination of household within village, village number within ward and ward number needs to be unique (see section 8.3 of the next chapter).

A number of other files (tables) which merge some of the data stored in each of the files shown in Fig. 7.1 across species have been added to the system. These are described later in section 7.5.5. There are, in addition, a number of files (tables) that store lists of codes defined for various variables. These are shown in Table 7.1.

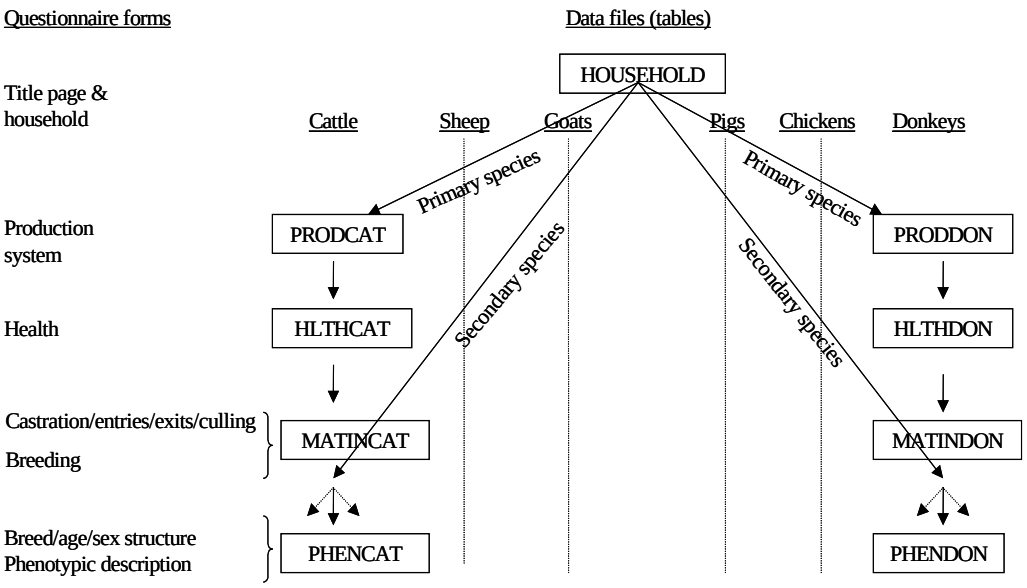


Fig. 7.1. *Description of the file structure within Breedsurv, the file names (referred to as tables in Access) and their relationships to primary or secondary species.*

Table 7.1. *Access files (tables) used to store codes.*

File name	Description
Enumerator	Codes for enumerators
Supervisor	Codes for supervisors
Province	Codes for provinces
District	Codes for districts
Ward	Codes for wards
Village	Codes for villages
Tribes	Codes for tribes
Breedcat	Codes for breeds of cattle
Breedshp	Codes for breeds of sheep
Breedgt	Codes for breeds of goats
Breedpig	Codes for breeds of pigs
Breedchk	Codes for breeds of chickens
Breeddon	Codes for breeds of donkeys
Prevdisease	Codes for prevalent diseases
Treatment	Codes for treatments (Question 2 of Health form)
Tradectopar	Codes for traditional methods for ectoparasites
Tradtryps	Codes for traditional methods for trypanosomosis
Tradinpar	Codes for traditional methods for internal parasites

This chapter is written in the form of a 'users' guide' to assist in data entry. Additional guidance in the data entry process is given in the next chapter. The handling of answers for certain questions in the questionnaire is also discussed there (section 8.2) and details provided for the codes used for breeds, diseases and treatments in the

Zimbabwe survey. It is suggested that these two chapters are printed and bound together and given to the data entry people to assist them in their work.

A copy of Breedsurv is stored in a CD attached to this report. The CD also contains, in a series of Excel files, the contents of all the files described in Fig. 7.1, showing the variable names, their types and descriptions so that the user can see how the answers to each question are stored. The CD also contains a copy of this report, a set of blank questionnaires and a colour chart.

Breedsurv is written in Access 97 software. The system can also be used in Access 2000. In order to use the system in Access 2000 the database supervisor first needs to convert the database into Access 2000. This is described later in section 7.5.1.

7.2 Getting started

The Breedsurv system must first be installed in a computer (or different computers – see section 7.5.6). To do so, copy the program file **Breedsurv** from the CD into the folder **Survey** in the computer (i.e. **c:\Survey\Breedsurv**). Then click the **Breedsurv** icon (see section 7.5.3), or if this has not been provided, open the survey program itself. The following screen should appear (Fig. 7.2).

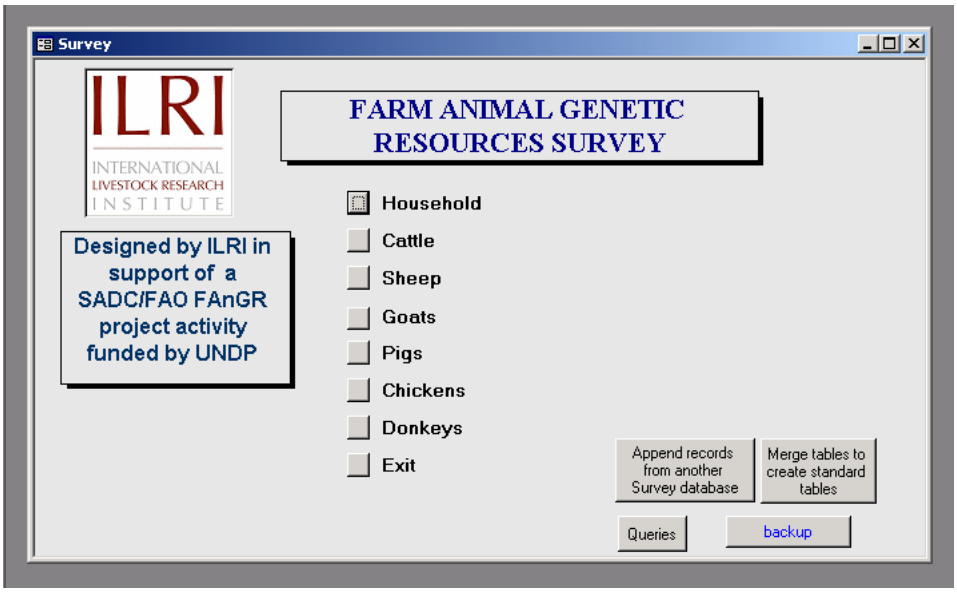


Fig. 7.2. *Main menu for the Breedsurv program.*

Click the **Household** button to enter new household data. The other buttons can be used when editing data that have already been stored. They enable the appropriate sections of the questionnaires to be reached more rapidly (see section 7.4.1).

The purposes of the '**Append'** and '**Merge'** buttons at the bottom right corner of the main screen (Fig. 7.2) are described in sections 7.5.6 and 7.5.5, respectively. Chapter 9 illustrates the use of the **Queries** button. The **backup** button is described in section 7.5.7.

The screen that appears next (not shown here) gives options for adding, editing, printing or previewing household data. Click the **Add/Edit** button on this screen.

7.3 Data entry

After selecting the **Household** and **Add/Edit** buttons the **Household** screen shown in Fig. 7.3 will appear. This is the first of three pages for the household data. The **Household** screen has been prepared to capture and store data from both the questionnaire title page and the two household information pages (see Fig. 7.1). On each page of a screen there is a **Page no.** button. This is used to move to the next of the screen pages, both for this and thee other sections of the questionnaire that are described later. Use the Page Up arrow from the keyboard to move up the screen. Use the Tab key, Enter key or Mouse to move from one data entry window (box) to the next. The thick arrows at the bottom right of the screen can be used to move to the next or previous household. The use of the **Locate Ward No.**, **Locate Village No.** and **Locate Household No.** buttons on the right side of the screen is described in section 7.4.1.

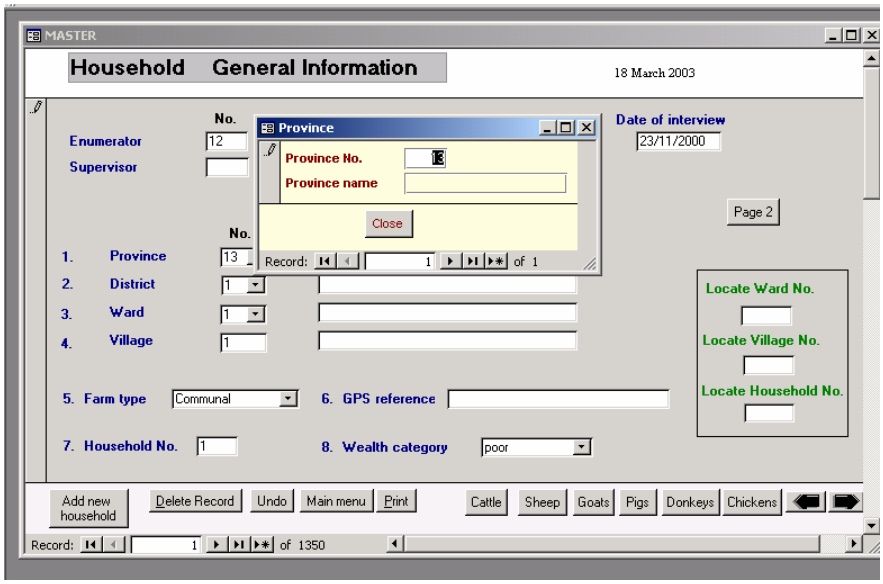


Fig. 7.3. *First screen page for household information.*

There are separate screens for each section of the questionnaire. To guard against accidental errors in failing to enter data, Breedsurv demands answers for certain questions; otherwise it will not permit movement to the screen for the next section. The individual questions for which data are mandatory are listed in the following sections.

At the bottom of the final household screen (not shown here), and for each other section of the questionnaire, there is a small window showing the **Status of data entry** with a drop-down list (entered, verified, query). The **Status of data entry** can be changed to **verified** when the data have been verified or to **query** if there is a query on a questionnaire page that the data entry person wishes to check with the supervisor.

7.3.1 Household data

If data have already been stored in the database then the **Household** screen, when the system is first opened, will show the details for the first ever household stored in the

database. In order to enter details for a new household click the **Add new household** button at the bottom of the screen.

The title and household pages for each questionnaire need to be entered first. The HOUSEHOLD file is linked to the files containing data from other sections of the questionnaire (Fig. 7.1). The **Ward, Village** and **Household** code numbers must be entered in order to proceed. They are the numbers that uniquely identify the village in which a household is located and also the household itself. If one of these numbers is omitted an error message will appear. It will not be possible to save the household information, nor to move to the next section of the questionnaire, without these values being specified.

As well as ward, village and household, unique code numbers will also have been assigned to the enumerator, field supervisor, province, district and tribe (see section 8.3 of the next chapter). Except for household numbers, the lists of codes will have been stored in separate files in the computer system (Table 7.1). If, when entering data in one of the above fields, the particular code number is not contained in the stored list, a message will appear asking for a new code to be entered. A small screen will appear superimposed on the main screen as shown in Fig. 7.4 for province. The new province code just entered will be displayed. Enter the province name and then click the **Close** button. The province name will be automatically updated in the **Household** screen. At the same time the province code number and name are appended to the table of province codes (Table 7.1) stored in Breedsurv.

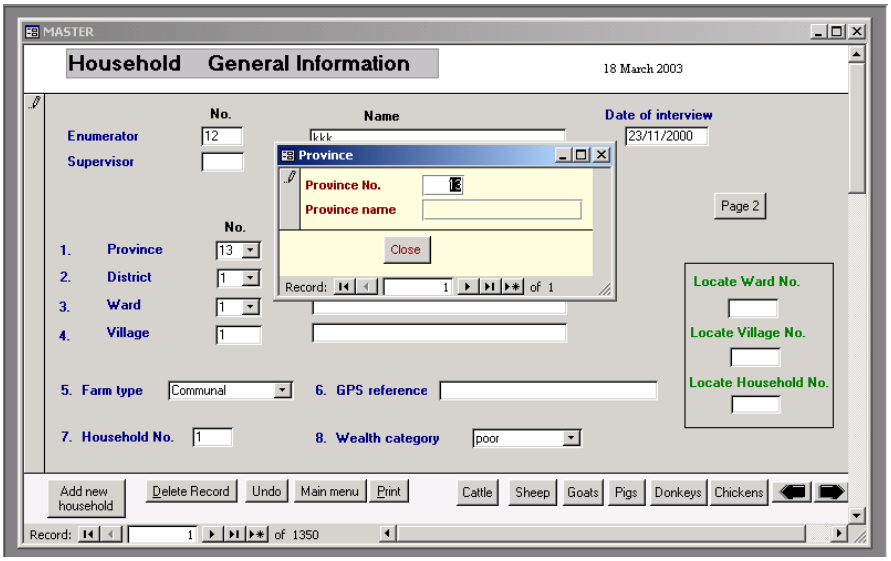


Fig. 7.4. *Illustration of small screen requesting a new province name to be stored in Breedsurv.*

Press the **Page** button to move through the screens to enter the data for the Household questionnaire form. Whenever there is a drop-down list for a field on a screen, click and select the appropriate entry.

An answer for the **Units** for **Land holding/farm size** (Question 5) of the Household page (Page 1c) must be entered from the drop-down list; otherwise the system will not allow the program to proceed to the screen for the next section of the questionnaire.

The drop-down list in this case is simply:

Acres
Hectares

One of the two answers must be chosen. Without either of these units of measurement the information on land holding/farm size is, of course, meaningless. As already mentioned, there are a number of data validation checks similar to this throughout the various screen pages for the different sections. These are to prevent erroneous data being entered and to ensure that data entry is not rushed with the possibilities of some entries being omitted.

All fields for **Livestock kept** (Question 9) must also be entered. Thus, if a field has been left blank on the questionnaire, enter **0**, otherwise the system will not allow the data entry to proceed to the next set of screens. This condition, as for Question 5, has been imposed to ensure that the data are carefully entered from the questionnaires.

Once the household information has been entered any species can be selected. Thus, for a CATTLE questionnaire, click the **Cattle** button at the bottom of the screen.

7.3.2 Production data

The first of five screen pages for **Production system** is shown in Fig. 7.5. The **Ward, Village** and **Household** numbers are carried forward from the **Household** screen.

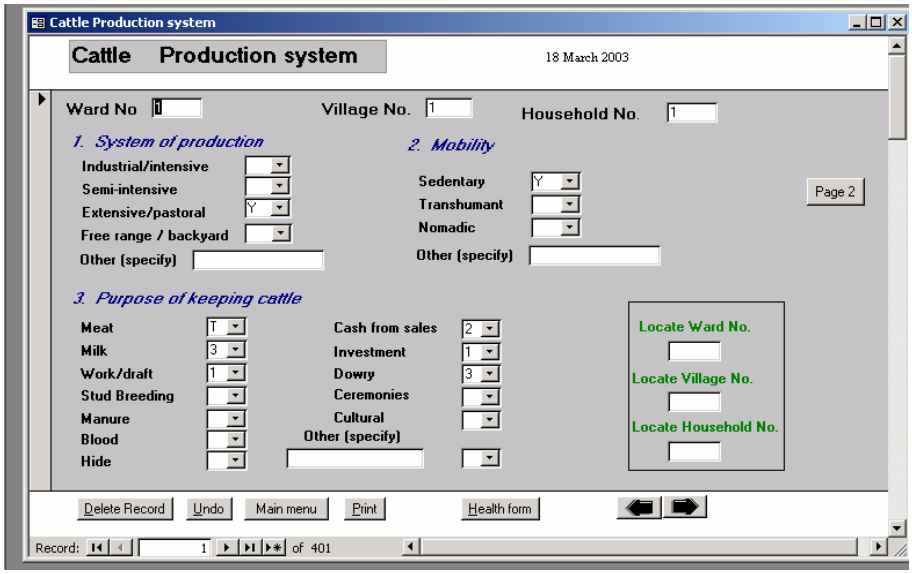


Fig. 7.5. *First screen page for production system data.*

Whenever a box is ticked in the questionnaire enter **Y** from the drop-down list. When a column is ticked and an adjacent column is used for ranking (e.g. Question 3, **Purpose of keeping cattle**), enter just the rank (**1**, **2** or **3**). If a question is ticked but there is no rank beside it, enter **T** (for 'tick') from the drop-down list.

For Question 6 on **Grazing/feeding**, Question 7 on **Housing** and Question 13 on **Distance to farthest watering point** the fields on the screen must be completed in order to proceed to the next section of the questionnaire. If a field has been left blank in the questionnaire for one of these questions, click **Not entered** from the drop-down list.

After the production data have been entered click the **Health form** button at the bottom of the screen.

7.3.3 Health data

The first of four screen pages for health information appears as illustrated in Fig. 7.6. **Ward, Village** and **Household** numbers are carried forward from the **Production System** screen.

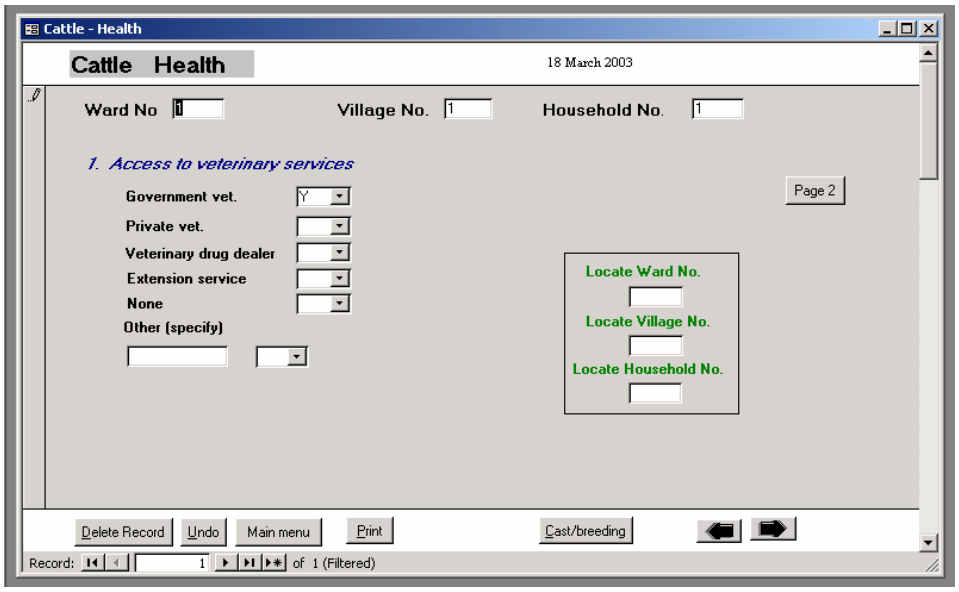


Fig. 7.6. *First screen page for health data.*

Prevalent diseases that occur on the farm (Question 2), **Vaccinations/preventive treatments given** (Question 3) and **Traditional** methods for **Ectoparasite control, Trypanosomosis control** and **Intestinal parasite control** (Question 4-6) (see Appendix 1) will have been coded. Tables 8.1 and 8.2 in the next chapter describe, respectively, the codes used for treatments and diseases in Zimbabwe.

If a code has been entered in the questionnaire for one of the above fields and the code has not been stored in Breedsurv, a small screen appears (similar to that described in section 7.3.1). Enter the new code and name as requested. The new code is appended to the list of codes stored in the appropriate file shown in Table 7.1.

The methods for **Ectoparasite**, **Trypanosomosis** and **Intestinal parasite control** are entered from drop-down lists. If no entry has been made (including 'None') the system will not allow the data entry to proceed to the next set of screens. Enter **Not entered** when this column has been left blank in the questionnaire. Note that the traditional methods are entered separately from the other methods. This is to allow entry of a traditional method in addition to one of the non-traditional methods.

Further notes on entry of health data are given in section 8.2.1 of Chapter 8. This section explains, for instance, what to do if more than one non-traditional method has been ticked by mistake.

After the health data have been entered click the **Cast/breeding** button to enter the castration/entries/exits/culling and breeding data.

7.3.4 Castration/entries/exits/culling and breeding data

The **Castration/breeding** screen shown in Fig. 7.7 is the first screen for entering castration/entries/exits/culling data. This is followed by five screen pages which also include pages for breeding data. The castration/entries/exits/culling and breeding data are stored together in MATCAT, MATSHP etc. files (Fig. 7.1). **Ward, Village** and **Household** numbers are carried forward from the **Health** screen.

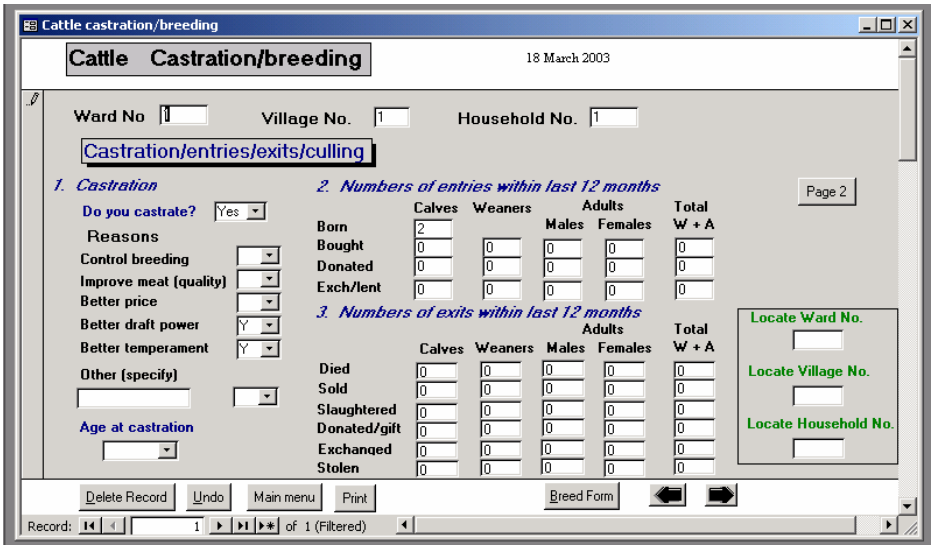


Fig. 7.7. *First screen page for castration/entries/exits/culling and breeding data.*

Where an X has been entered in a box for the questionnaire to signify 'unknown' for the numbers of entries or exits (see section 4.8 of Chapter 4) do not enter anything into the corresponding box – leave the box on the screen blank. A blank and a zero are distinguished differently in the computer. A zero means 'none', whereas a blank means 'not known'.

The Breeding page (Page 7c) in the questionnaire contains a question on **Source and breed(s) of bull(s) used in the herd** (Question 4). Enter the breed code if given. The breed codes are saved in separate files for each species in the computer system (Table 7.1). As for previous sections of the questionnaire a small screen will appear, superimposed on the main screen, if the code has not been used before. Enter the breed name into the box provided.

An answer to Question 1 on **Primary reasons for keeping bull(s)** (e.g. for breeding) must be entered from the drop-down list, otherwise Breedsurv will not allow the data entry to proceed to the next set of screens. Enter **Not entered** from the drop-down list if the field is blank in the questionnaire.

After the castration/entries/exits/culling and breeding data have been entered click the **Breed Form** button to enter the Breed/age/sex structure page of the questionnaire.

7.3.5 Breed/age/sex structure data

A question first appears asking if data are to be entered for a pure breed. Click **Yes** or **No**. If the answer is **Yes** the first of two screen pages is shown as illustrated in Fig. 7.8. **Ward, Village** and **Household** numbers are carried forward from the **Castration/breeding** screen.

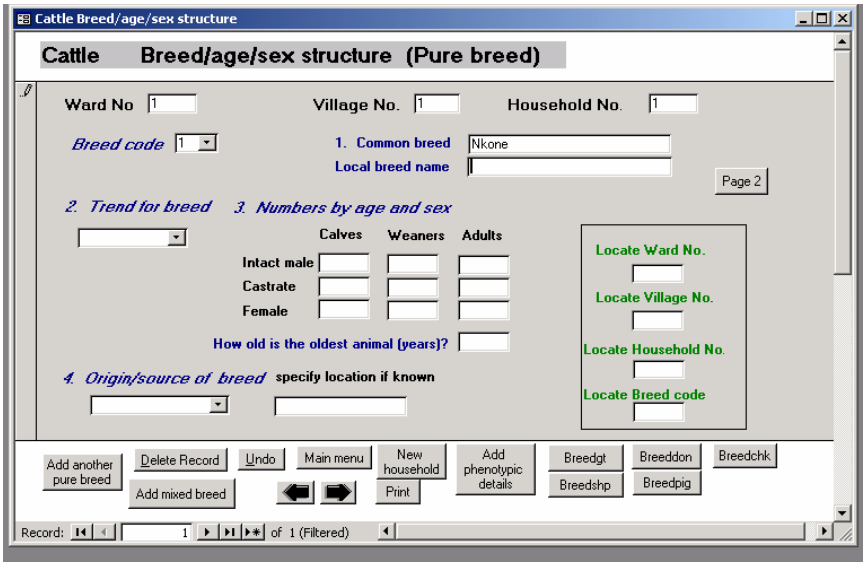


Fig. 7.8. *First screen page for breed/age/sex structure data for a pure breed.*

The breed code is entered in the same way as codes for province, disease etc. The common name of the breed will automatically appear in the box alongside. However, if a local name has been written in the box on the questionnaire, this needs to be entered separately. There is no code for a local breed name.

An answer to **Size** in Question 5 on **Quality of traits perceived by owner** must be given, otherwise the system will not allow the data entry to proceed to the next set of screens. As described earlier, this condition is imposed to ensure that data are entered carefully and not too rapidly. An answer to the question on **Size** would be expected. In the unlikely event that this question has been left blank enter **Not entered** from the drop-down list.

If there are data for more than one pure breed, or mixed breeds as well, then, click the button **Add another pure breed** or **Add mixed breed** as appropriate. Once the breed/age/sex structure data have been entered for all breeds, click the **Add phenotypic details** button to enter phenotypic information for one of the breeds. If there are no phenotypic data to be entered, click one of the appropriate **Breed** buttons to enter data for a secondary species or, if all data have been entered for the household, click the **New household** button. When the button for **Add phenotypic details** is clicked, the system will ask for the breed code. This code should be for one of the breeds for which the breed/age/sex structure details have been entered for the household.

7.3.6 Phenotypic descriptors

The first of three screen pages for phenotypic descriptors for cattle is shown in Fig. 7.9. **Ward, village** and **Household** numbers are carried forward from the **Breed/age/sex structure** screen.

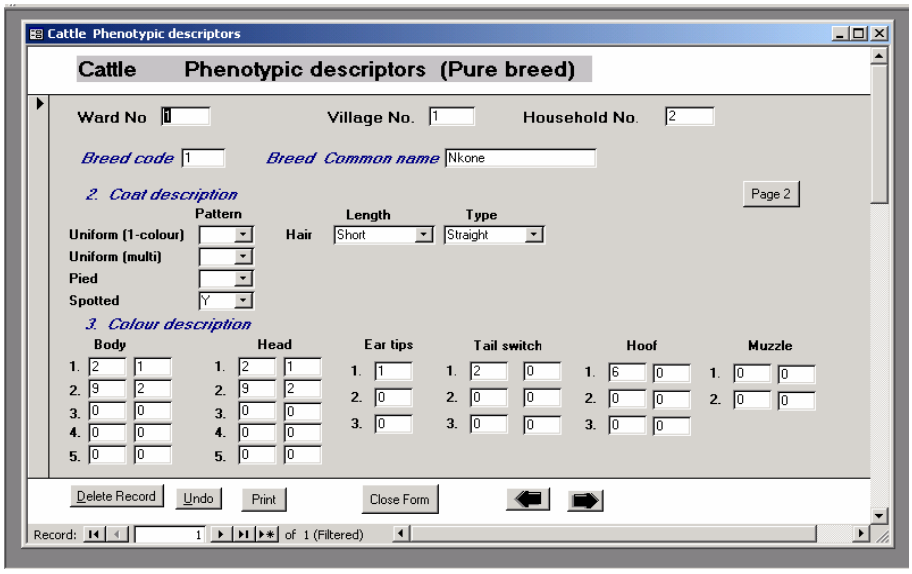


Fig. 7.9. *First screen page for phenotypic descriptors for a pure breed of cattle.*

The questions on colour description (Question 3) for body, head, tail switch, hoof and muzzle have two sets of boxes. The first is for the primary colour and the second, in the same row, for the secondary colour. The primary colour has to be entered first and then the secondary colour. Also the primary and secondary colours, if entered, should be different. If there is only one colour leave the second box blank.

Once the phenotypic details have been entered click the **Close Form** button. Unlike the other screens described earlier there is no compulsory entry requirement for any of the phenotypic descriptor questions. The system goes back to the **Breed/age/sex structure** screen (Fig. 7.8). Continue as described under section 7.3.5.

For all the screens described in sections 7.3.1 to 7.3.5 there is an option for returning to the **Main menu** screen. The details stored on any screen can be printed by clicking the **Print** button.

7.4 Editing and printing data

7.4.1 Editing

Data may be edited at any time. To edit household data click the **Household** button in the **Main menu** (Fig. 7.2) and then click the **Add/Edit Household data** button. Enter details in the **Locate Ward No., Locate Village No., Locate Household No.** box of the household for which data are to be edited. The first screen page for this household will appear. The user can then either edit the household data or edit data from other sections

of the questionnaire for that household by pressing the appropriate species button at the bottom of the screen and moving to the required screen for that species.

There is, however, an alternative method for editing individual sections of the questionnaire. In addition to a button for **Household** on the **Main menu** there are buttons for **Cattle, Sheep, Goats, Pigs, Chickens** or **Donkeys** (see Fig. 7.2). To edit data for a particular species directly, first click the appropriate species button (Fig. 7.2). The following screen (Fig. 7.10) will appear when the **Cattle** button is clicked.

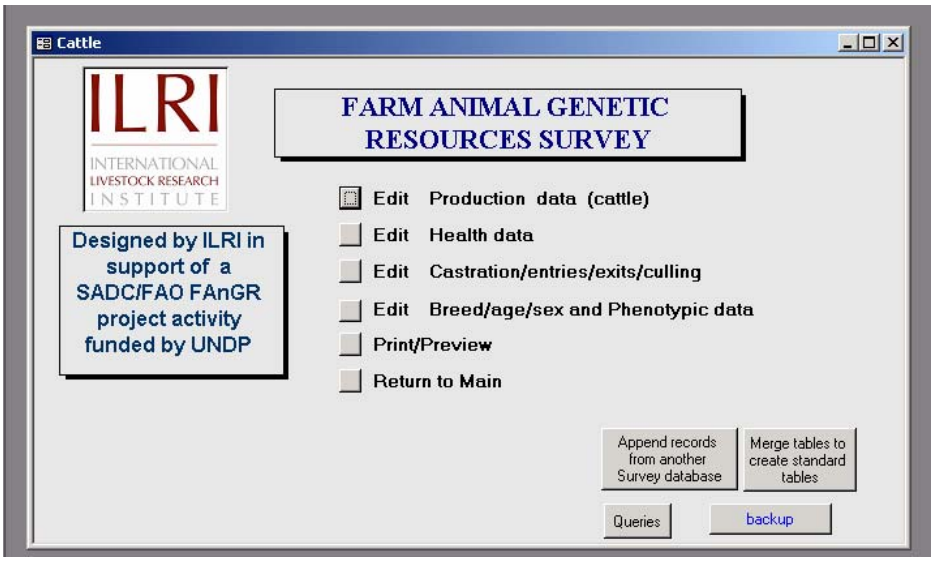


Fig. 7.10. *Menu for selecting a section of the questionnaire for editing.*

Click the button for the appropriate section of the questionnaire to be edited. Thus, if data pertaining to the production system are to be edited, click the **Edit Production data** button and a screen such as shown in Fig. 7.11 will appear.

The screen is the first screen page for the production system data belonging to the first ever household entered with cattle as the main species. This is the same screen as shown in Fig. 7.5 but it now contains data. Enter the details of the household to be edited in the **Locate Ward No.**, **Locate Village No.** and **Locate Household No.** boxes. The production system data for the specified household will then appear on the screen. Move down the different sections of the screen to find the appropriate value(s) in windows (boxes) to be changed. Then either click the **Health form** button to proceed to the next screen for the same household, click the **Main menu** button to return to main menu, or enter details in **Locate Ward No.**, **Locate Village No.** and **Locate Household No.** boxes to edit production system data for another household.

7.4.2 Printing

Click the button on the **Main menu** (Fig. 7.2) for the species required. Then click the **Print/Preview** button on the screen that next appears (Fig. 7.10). If cattle are selected on the main menu screen then the screen shown in Fig. 7.12 will appear.

Click the appropriate button for the particular page to be printed or previewed. For example, when the **Print/Preview Production** button is clicked the screen shown in Fig. 7.13 will appear for the first household. The user can scroll down to see the rest of the page or press the arrows at the bottom left of the screen to move from one household

to the next. A page, or group of pages, can be printed by clicking the **File** button at the top left of the tool bar and then selecting the appropriate print option.

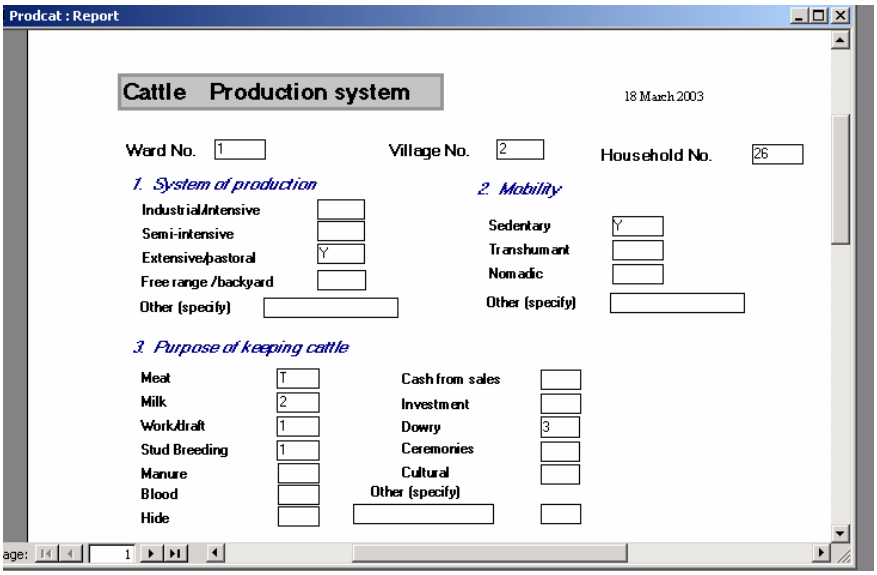


Fig. 7.11. *First screen page for production system data for the first household entered in the database.*

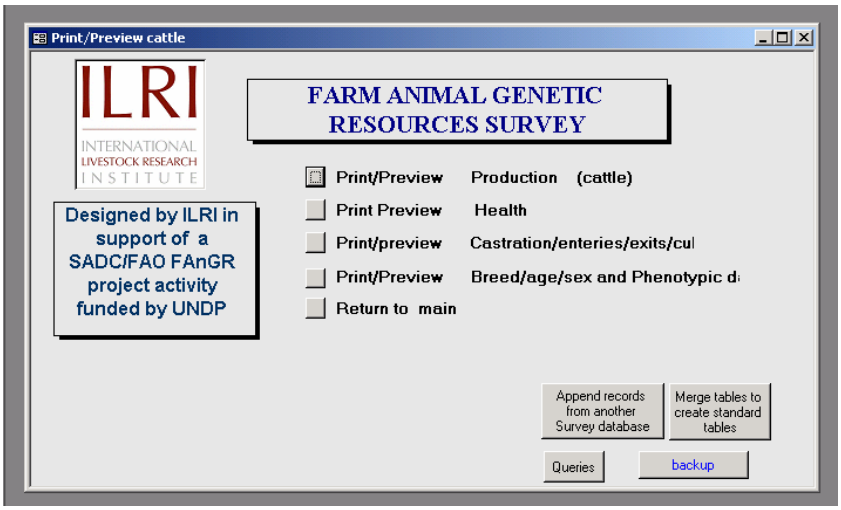


Fig. 7.12. *Menu for selecting sections of the questionnaire for printing or previewing.*

In order to print a particular page from a particular household an alternative approach should be used. Go through the process for editing data under section 7.4.1. Enter details in the **Locate Ward No.**, **Locate Village No.** and **Locate Household No.** boxes to locate the required household and then click the **Print** button at the bottom of the screen.

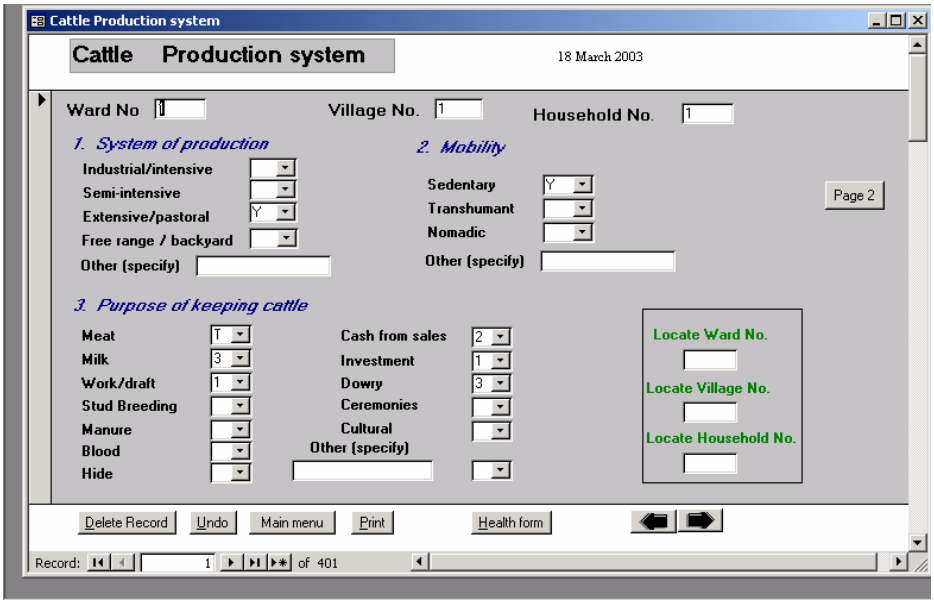


Fig. 7.13. *Preview of production system data for the first household entered in database.*

7.4.3 Deleting data

There are options on each of the screens for deleting data. Caution, however, is required when using the **Delete Record** button. If this button is clicked on the **Household** screen, then all data belonging to the household (i.e. all the data from all pages of the whole questionnaire) are deleted. The user must be sure, therefore, that this is what is intended. When the **Delete Record** is used for other screens (e.g. **Production system**, **Health**) only the data contained in the particular screen will be deleted. Whenever the **Delete Record** button is pressed the user is prompted to verify that the records in the screen(s) are indeed to be deleted.

7.4.4 Undo button

There is an option on each of the screens for 'undoing' data entry. If the user finds that a mistake has been made in entering data for a particular questionnaire and he/she wishes to undo all that has been done, then clicking the **Undo** button will transfer the program back to the **Household** screen. Any data entered in any of the screens for the household will be deleted. On the other hand, if mistakes arise while editing data that have been stored previously, then the clicking of the **Undo** button will revert to the data that existed before editing started. In this case the system does not move back to the **Household** screen.

7.5 Database administration

7.5.1 Installing Breedsurv

Breedsurv should be first copied from the CD into a folder **c:\Survey**. Although the Breedsurv system has been written in Access 97, it can be translated into Access 2000.

When using Access 2000 to load Breedsurv, a **Convert/open database** dialog box will appear. Click the **Convert database** toggle box and then the **OK** button. Another dialog box **Convert database into** will appear. Type in a new name for the database and click the **Save** button. The database will now be compiled and converted to Access 2000. Rename the new database **Breedsurv.** Different computers on which the database is installed (see section 7.5.6) must have the same version of Access (i.e. one computer should not be using Access 97 and another using Access 2000) since there are incompatibilities in the two versions.

7.5.2 Security

It is preferable to define a password to allow access to Breedsurv. This will ensure that no one will have access to the database who does not know the password.

To set a password, move to the **Survey** folder and choose **Open** from the **File** menu. An **Open** dialog box will appear. Type in the filename (**Breedsurv**) or highlight the database and then click the arrow to the right of **Open** button. Choose **Open Exclusively** and then type in the filename (**Breedsurv**). From the **Tools** menu at the top choose **Security** and then **Set database password**. Type the password. This is the password to be used for future access to the **Breedsurv** database.

There are other options provided by the **Security** facility. If the database administrator is familiar with Access then he/she can define different rights for different users.

7.5.3 Shortcut icon

A shortcut icon can be created for Breedsurv so that users can click the icon from the desktop window and open the database without needing to know where the database is located. Click the right button on the mouse and choose **New**. Then choose **Shortcut.** Type in the path and filename, together with its extension (i.e. **c:\Survey\Breedsurv.mdb**). Click the **Next** button and type in the name **(Breedsurv)** for the shortcut icon and then click **Finish** button. A shortcut icon called **Breedsurv** will be created on the screen.

7.5.4 Data storage

As already described in section 7.1 there are 25 main files (referred to as tables in Access) that make up the database. In addition, there are other files (tables), 18 in number, with lists, of codes for enumerator, field supervisor, province, district, ward, tribe, breed for each species, disease, treatment and traditional methods for ectoparasite, trypanosomosis and intestinal parasite control, as shown in Table 7.1. For illustration purposes the contents of the file Breedcat containing the breeds of cattle defined for the Zimbabwe survey are shown in Table 7.2. There are also a number of tables that result from merging across species some of the answers to questions contained within the 25 main files in Fig. 7.1. These are described in the next section (7.5.5).

Data are usually stored in the main files (tables) listed in Fig. 7.1 as numeric values. Thus, entries in a drop-down list are coded according to the numerical position (1, 2, ….) that they occupy. The main exception is when text is entered under an ‘other’ option. This is stored in the computer as text, exactly as entered. The structure of the first part of the HOUSEHOLD file is illustrated in Table 7.3. Thus, for Question 1 in the Household questionnaire form (see Page 1c in Appendix 1), a spouse of the head will be stored as number 2, being the second item in the list (see variable hhpos in Table

7.3). When **Y** is ticked for a question, it is stored as 1**,** when **T** is entered as part of a ranked list (see Fig. 7.5) it is stored as 8. A code of 88 is reserved in the computer for entering data for mixed breeds. The breed code for any mixed breed is thus stored automatically as 88. Thus, a pure breed code must not be set to 88.

Table 7.2. *Breed codes for cattle as stored in the Breedcat table for the Zimbabwe survey.*

brd_no	brd_name	species
1	Nkone	CATTLE
2	Tuli	CATTLE
3	Mashona	CATTLE
4	Afrikaner	CATTLE
5	Brahman	CATTLE
6	Hereford	CATTLE
7	Aberdeen Angus	CATTLE
8	Simmental	CATTLE
9	Limousin	CATTLE
10	Charolais	CATTLE
11	Jersey	CATTLE
12	Friesland	CATTLE
13	Holstein	CATTLE
14	Ayrshire	CATTLE
15	Red Dane	CATTLE
16	Red Poll	CATTLE
17	Guernsey	CATTLE
18	Norwegian Red	CATTLE
19	Santa Gertrudis	CATTLE
20	Brown Swiss	CATTLE
21	Bonsmara	CATTLE
22	Sussex	CATTLE
23	Tonga	CATTLE
24	Matebele	CATTLE
25	Unknown cross	CATTLE
26	Mashona (multicoloured)	CATTLE
27	Beefmaster	CATTLE
28	Salers	CATTLE

Drop-down lists are used for storage when only one answer to a question can be ticked as in Question 1 above. In questions such as Question 4 on Page 2c, however, (see Appendix 1) when more than one answer may be ticked, separate variables taking on values 0 or 1 are defined in the database for each possible answer. It is essential that the user is aware of these two different methods of storage and takes this account when analysing the data. This is discussed further in Chapters 9 and 10.

7.5.5 Merging data by species

To aid the production of tables classified by species and province, Access programs have been written to create new data files (or tables) that combine the information for different species. These files are shown in Tables 7.4a and b. This is done using the

macro **'table merger'** which can be found among the macros stored in the Breedsurv database. Also, on the right hand corner of the main menu (Fig. 7.2) there is a button **Merge tables to create standard tables.** By clicking this button the **'table merger'** macro is executed automatically.

Table 7.3. *Design of the file structure for the first part of the HOUSEHOLD file (or table) in Breedserv.*

Name	Type	Size	Description
Enumname	Text	50	Enumerator name
Enumcode	Number (Long)	4	Enumerator Code no
Date	Date/Time	8	Date of interview
Supvname	Text	50	Supervisor name
supvcode	Number (Long)	4	Supervisor code no.
provname	Text	50	Province name
Provno	Number (Long)	4	Province Code no
Distname	Text	50	District name
Distno	Number (Long)	4	District Code no
wardname	Text	50	Ward name
Ward	Number (Long)	4	Ward Code no
Villname	Text	50	Village (VIDCO)
village	Number (Long)	4	Village (VIDCO) Code no.
hhold	Number (Long)	4	Household no.
farm_type	Number (Long)	4	Farm type
gpsref	Text	50	GPS reading
wlth_cat	Number (Long)	4	Wealth category
interview	Text	50	Interviewee
hhpos	Number (Long)	4	Position in household
hh_oth	Text	50	Position in household (Other)
sex	Text	2	Household head - Sex
age	Number (Long)	4	Household head - Age
tribe_name	Text	50	Tribe Name
tribe_code	Number (Long)	4	Tribe Code no.
hh_male	Number (Long)	4	Number of people residing in household - Males
hh_fem	Number (Long)	4	Number of people residing in household - Females
hh_child	Number (Long)	4	Number of people residing in household - <15 yrs
crop_ha	Number (Double)	8	Land holding / farm size - Crop Area
graz_ha	Number (Double)	8	Land holding / farm size - Grazing area
forst_ha	Number (Double)	8	Land holding / farm size - Forest area
tot_area	Number (Double)	8	Land holding / farm size - Total area
units	Number (Long)	4	Land holding / farm size - Units
land_own	Number (Long)	4	Land ownership - Own
land_lease	Number (Long)	4	Land ownership - Lease
land_other	Number (Long)	4	Land ownership - Other
oth_land	Text	50	Land ownership - Other (Specify)
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

Thus, the PROD_SYS_OWN file shown in Table 7.4a contains, for all six species, data on system of production and members of the household who own livestock (Questions 1 and 4, respectively, of Page 2 of the questionnaire – see Appendix 1).

Note that the convention of capitals throughout applies to all the main Access database table or files (Fig. 7.1, Tables 7.4a and b); lower case letters are used to define queries (see Chapter 9) in order to distinguish them from the main database tables or files. Lower case letters are also used for naming the tables that contain codes (Table 7.1). In a similar way PROD_GRZ_SUPP contains data for cattle, sheep, goats, pigs and donkeys on grazing and supplementation (Questions 6 and 10, respectively, on Pages 2 and 3 of the questionnaire). Answers for chickens are not included in this data file because the formats of the questions are somewhat different (see Appendix 1).

Answers to questions on housing, the materials used and the form of housing (Questions 7-9 on Pages 2c, 2s, 2g, 2d and Questions 6-8 on Page 2p) are contained in PROD_HOUSE for all species except chickens. In a similar way the answers to Questions 11-15 on Pages 2c, 2s, 2g and 2d and Questions 10-14 on Page 2p in relation to watering are stored in PROD_WATER for the same five species (see Table 7.4a).

The formats of Questions 1, 2 and 3 in relation to health on Page 4 of the questionnaires (see Appendix 1) are the same for all species. The format of Question 4 on Page 5, but for a slight difference for chickens, is also the same (Table 7.4.a). The formats for Questions 5 and 6 on Page 5 are the same for five of the six species, but not for chickens. Two data files have been created: HLTH_ONE and HLTH_TWO for Questions 1- 4 for all species and for Questions 5 and 6, omitting chickens, respectively (Table 7.4a).

The data recorded on the Castration/entries/exits/culling and Breeding pages of the questionnaire (Page 6c and 7c for cattle, for example) are stored for each species together in one file, namely MATINCAT, MATINSHP, etc. (see Fig. 7.1). As for the other files described earlier certain questions on these pages have been combined across species. Thus, MAT_CAST contains the answers to Question 1 on Page 6 of the questionnaires for all species except chickens, and MAT_BREEDING combines the answers to Questions 3 and 4 on Page 7c and the corresponding question numbers on the pages for the other species (see Table 7.4b and Appendix 1). Occasionally, when combined, the contents of questions differ slightly across species; this applies particularly to the merging of files to produce MAT_CAST. Such differences are noted in Tables 7.4a and b. A data field that does not apply to a particular species is set to zero in MAT_CAST or MAT_BREEDING. Care is needed in interpreting such data.

Data from PHENCAT, PHENSHP etc. files (Fig. 7.1) are also extracted and stored in merged files. Thus, the answers to Questions 1 and 2 on Pages 8 and 9 for pure breeds of five of the species, excluding donkeys, are stored in PHEN_PURE. The answer to the question on 'origin/source of breed' is also included (see Table 7.4b). PHEN_CROSSES combines the answers to Question 1 for the mixed crosses (excluding donkeys) and PHEN_AGE_SEX the questions on numbers by age and sex for both pure breeds and mixed crosses combined, but excluding chickens (see Table 7.4b). Files PHENCAT_PHEN, PHENSHP_PHEN etc. have also been created (Table 7.4b). These files are not merged across species; instead they contain, for each species, data from only those households for which phenotypic details have been recorded for that species.

In the generation of each of the above files the province number contained in the HOUSEHOLD file is also inserted to simplify the creation of output tables classified by province. Many of the retrievals in a preliminary data analysis are likely to require classification by province (see Chapter 9).

It is important to note that the **Merge tables to create standard tables** button on the **Main menu** must be clicked whenever the database has been edited, If not, the data contained in these tables will be those that were stored when the tables were previously updated.

Table 7.4a. *A summary of some of the files (tables) that have been created to combine records for the different species, describing the source files (tables) (see Fig. 7.1), the questions from the questionnaires (see Appendix 1) and the species involved.*

File name	Source files	Contents	Species	Comments
PROD_SYS_OWN	PRODCAT etc.	P.2 (Q.1, 4)[a] P.2ch (Q.1,3)	All	
PROD_GRZ_SUPP	PRODCAT etc.	P. 2/3 (Q.6,10) P.2/3p (Q.5,9)	Not chickens	Q.5 'Herded' not in question for pigs. Q.9 'Kitchen waste included in question for pigs instead of 'roughage / crop residue'.
PROD_HOUSE	PRODCAT etc.	P.2/3 (Q.7-9) P.2/3p (Q. 6-8)	Not chickens	
PROD_WATER	PRODCAT etc.	P.3 (Q.11-15) P.3p (Q10-14)	Not chickens	Q.12 '>10 km' not included in question for pigs.
HLTH_ONE	HLTHCAT etc.	P.4/5 (Q.1-4)	All	Q.4 'Dip, pour-on, hand dressing, injectables' not included in question for chickens.
HLTH_TWO	HLTHCAT etc.	P.5 (Q.5,6)	Not chickens	
MAT_CAST	MATINCAT etc.	P.6 (Q.1)	Not chickens	Q.1 'Better price' only included for cattle; 'better draft power' not included in question for sheep, goats and pigs, improved meat quality not included for donkeys.
MAT_BREEDING	MATINCAT etc.	P.7c,d,ch (Q.3,4) P.7s,g (Q.3,5) P.7p (Q.3,6)	All	Q.4 Breeds of males not included in question for donkeys.
MAT_ENTRIES_EXITS	MATINCAT etc.	P.6 (Q.2,3)	Not chickens	

[a] As described in Appendix 1. When no letter follows a page number, the page number refers to all species not otherwise specified

Table 7.4b. *A summary of some of the files (tables) that have been created to combine records for the different species, describing the source files (tables) (see Fig. 7.1), the questions from the questionnaires (see Appendix 1) and the species involved.*

File name	Source files	Contents	Species	Comments
PHEN_PURE	PHENCAT etc.	P.8/9 (Q.1 2,4)[a] P.8/9ch (Q.1,2,5) P.8/9d (Q.3)	All	Pure breed section of questionnaire page.
PHEN_CROSSES	PHENCAT etc.	P.9 (Q.1)	Not donkeys	Mixed crosses section of questionnaire page.
PHEN_AGE_SEX	PHENCAT etc.	P.8/9 (Q.3 pure) P.9 (Q.2 mixed)	Not chickens	
PHENCAT_PHEN	PHENCAT	P.10 (all questions)	Cattle	Contains just the households for which phenotypic data were recorded.
PHENSHP_PHEN	PHENSHP	P.10 (all questions)	Sheep	
PHENGT_PHEN	PHENGT	P.10 (all questions)	Goats	
PHENPIG_PHEN	PHENPIG	P.10 (all questions)	Pigs	
PHENCK_PHEN	PHENCK	P.10 (all questions)	Chickens	
PHENDON_PHEN	PHENDON	P.10 (all questions)	Donkeys	

[a] As described in Appendix 1. When no letter follows a page number, the page number refers to all species not otherwise specified.

7.5.6 Appending databases

The Breedsurv database can be installed in several computers for data entry purposes (each with the name B**reedsurv.mdb**). This was done at Matopos Research Station for the Zimbabwe survey so that several people could work simultaneously on data entry.

To append the databases together, once data entry has been completed, first rename each database by computer number (e.g. B**reedsurv1**, **Breedsurv2**, etc.) and copy onto a CD. Copy into a computer one database (say B**reedsurv1**) with which all databases are to be merged. This will be used as the source database and the other databases will be appended to it.

Open the **Breedsurv1** database. On the right hand corner of the **Main menu** there is a button for **Append records from another Survey database** (see Fig. 7.2)**.** Click the button and a dialog box for **Source file to which the file is to be copied** will appear. Type in the source file with the path and filename with extension (e.g. **c:\Survey\Breedsurv1.mdb**) and click the **OK** button. A dialog box for **File to be appended from** will appear. Type the path and filename with extension for the file to be appended from the CD (e.g. **d:\Breedsurv2.mdb**). Start from the **Main menu** again, replace the CD and repeat the process to append the next file. The B**reedsurv1.mdb** database, which is the source file, will then contain all the data and can be renamed **Breedsurv.mdb**.

7.5.7 Backing up

The database should be backed up frequently. In order to use the **backup** button in the main screen (Fig. 7.2), the working version must be filed in the folder **Survey** as described in section 7.5.1. A **Survey_backup** folder is also needed for storing the backups. Pressing the **Backup** button on the **Main menu** automatically copies the current version of the database to the **Survey_backup** folder and names the copy **Breedsurv'date'** (e.g. **Breedsurv14_3_2003**). If a CD writer is available then it is advisable to occasionally copy the database also to a CD. There is no automatic facility in Breedsurv for this.

CHAPTER 8

Computer data entry and data coding

The importance of good quality control in computer data entry cannot be over-emphasised. All the efforts in ensuring good quality of recording by enumerators can be wasted if mistakes are made when the data are entered into the computer.

Various data range checks are included in Breedsurv, as described in Chapter 7, to prevent faulty data entry, but not all data can be checked in this way. It is essential that careful supervision and clear rules for data entry and for coding the data are made. The following comments are given here to assist those who may have little experience in computer handling of data.

8.1 General guidelines for data entry

From experiences with computer entry of data in the Zimbabwe survey the following observations can be made.

1. The time involved should not be underestimated. Sufficient numbers of data entry staff and computers need to be available. Three people at Matopos Research Station were appointed to undertake the task of entering data from the questionnaires and each was assigned his/her own computer. About 30-45 minutes should be allowed to enter the data from one questionnaire. This depends on the skill of the data entry person.

2. Data entry people should be used who preferably have had previous experience in data entry. Those at Matopos Research Station had not. They were animal technicians. This had the advantage that they understood the data but the disadvantage that they were inexperienced in data entry.

3. The data entry people need to work under close supervision. The supervisor should be a database administrator who has experience in database management and data analysis.

4. All questionnaires should be checked by the database supervisor and coded for diseases and treatments (as discussed in section 6.6 of Chapter 6) before they are given to data entry staff.

5. **Data entry staff should not fill in any codes themselves**. This is the task of the supervisor. If a code has not been entered then action should be taken as described in item 6 below and the questionnaire returned to the database supervisor.

6. Data entry staff should not be expected to make their own inferences when entries in the questionnaire are ambiguous. A note should be attached to the questionnaire by the data entry person and the questionnaire returned to the supervisor after the remaining data have been entered. An entry 'query' should also be made in the window (box) at the bottom right of the computer screen associated with the particular questionnaire page (see section 7.3 of Chapter 7). The supervisor will advise later what to do.

7. If more than one box has been filled in the questionnaire in response to a particular question, yet the computer only allows one value to be entered, the data entry person should enter 'query' in the box at the bottom right of the screen and, as for item 6, seek the advice of the database supervisor.

8. Once all the questionnaires have been entered and the supervisor has attended to all the queries that have been written down by the data entry staff, each batch of questionnaires should be given to another person to verify that the data have been entered correctly. Thus, each data entry person verifies the data that another person has entered. To do this the person should go through each questionnaire, comparing what is written down with what has been entered, correct on each screen any mistake that has been made, and then enter 'verified' into the box at the bottom of the screen. If there is still a problem, enter 'query' into the box and attach a note to the questionnaire for the supervisor to review.

9. A worksheet should be prepared by the supervisor before data entry starts, so that data entry staff can record the dates when questionnaires are entered into the computer and the dates when they are verified. The database supervisor also needs to sign the work sheets/questionnaires when he/she is happy that data entry, verification and editing have been completed satisfactorily.

10. Once all data have been verified and additional edits made to the database, the supervisor can run a number of output tables that have been programmed in Breedsurv (see Chapter 9). The contents of these tables may sometimes identify strange values that may be the results of mistakes in recording.

11. Any alterations made to what the enumerator may have written should be noted clearly on the questionnaire. This should be done by the supervisor **in red** in order to distinguish from the original information given by the enumerator.

12. The supervisor must make sure that the data entry persons are making regular backups of their databases as described in section 7.5.7 of Chapter 7.

13. Finally, when the supervisor is satisfied that the data have been fully checked and validated, he needs to merge the individual databases stored in each computer into one master database. This is so that all data can be stored in one computer for the purposes of analysis (see section 7.5.6). Protection rights can be provided (section 7.5.2) to allow only certain people to alter the contents or structure of the database. Other users will not be given 'write access'.

8.2 Items for special attention in data entry.

A few experiences in handling the data entry of questionnaires in the Zimbabwe survey have highlighted the following points to note in terms of the Health (see section 7.3.3 of previous chapter), Castration/entries/exits/culling (section 7.3.4) and Breed/age/sex structure (section 7.3.5) pages of the questionnaire.

8.2.1 Health (Page 4c/5c)

Question 2. Prevalent diseases that occur on farm (section 7.3.3)
Sometimes the enumerator may have crossed something out and written the correct answer on the next line. Do not leave any lines blank between entries in the window (box) on the computer screen. Always enter the first disease written down on the questionnaire as line 1 in the window, the second as line 2, etc. This will facilitate subsequent data analysis and ensure that there are no blank lines between individual disease entries.

Question 3. Vaccination/preventive treatments given
Same as question 2.

Question 4. Ectoparasite, Trypanasomosis and Intestinal parasite control
At least one of the boxes under 'Method' should have been ticked for each of these questions. If more than two items, excluding 'Traditional', have been ticked the supervisor's advice should be sought. He/she may recommend one of the items to be entered under 'Other'. Note that a tick for 'Traditional' is entered in a different box on the computer screen. Thus, simultaneous ticks for 'Traditional' and another non-traditional method are allowed.

Question 5. Trypanosomosis control.
Similar difficulties may arise as for Question 4.

8.2.2 Castration/entries/exits/culling (Page 6c)

Question 2. Number of entries within last 12 months
Some of the boxes may contain 'X'. Leave these boxes blank when entering the data into the computer. (This is also mentioned in section 7.3.4 of Chapter 7.)

Question 3. Number of exits within last 12 months
'X's should be treated as for Question 2.

8.2.3 Breed/age/sex structure (Page 8c/9c)

Question 1 for mixed crosses. Breeds apparently used to produce mixed crosses in herd
As for Question 2 (section 8.2.1) always enter the first breed written on the questionnaire in the first line of the box on the screen. Do not leave any lines blank when the enumerator may have crossed something out.

Question 3. Numbers by age and sex
As for section 8.2.2 leave blank any box that contains 'X'

8.3 Coding of data

As discussed in Chapter 4, numerical codes need to be assigned to enumerator, field supervisor, province, district, ward, village, household, tribe, disease, treatment, traditional methods and breed. The combined code for household within village within ward must be unique. Villages can be numbered 1, 2 …… or be assigned any other unique code within a ward. Likewise, a household can be assigned a number from 1 upwards within a village (or again be assigned any other unique code). Wards must receive a unique code. The responsibilities for writing the codes on a questionnaire in the Zimbabwe survey were as follows:

- **Field supervisor/enumerator**: enumerator, supervisor, province, district, ward, village and household.

- **Central co-ordinating office**: tribe, breed, disease, treatment and traditional methods.

It is possible that a code for a disease or treatment may need to be defined during the data entry phase which had not been anticipated at the start of the survey. For this reason it was decided that all coding for diseases should be done at Matopos Research Station for the Zimbabwe survey. The coding of breeds was also done at Matopos Research Station, but in other surveys it may be possible for this to be done in the field. If so, any code for a breed that had not been anticipated at the start of the survey can be left blank for the central co-ordinating office to define later.

The treatment, disease and breed codes used in the Zimbabwe survey are shown in Tables 8.1- 8.4. Note that one set of codes is used for treatments across all species (Table 8.1), whereas each species has its own set of breed codes (Table 8.4). The list of breed codes for cattle is shown in Table 7.2 of Chapter 7 in the way that they are stored in the Breedcat file (Table 7.1). Some disease codes are defined across all species (Table 8.2), some are specific to each species (Table 8.3). However, all disease codes are stored in the same file (table) in the computer system, namely Prevdisease (see Table 7.1 of Chapter 7).

Table 8.1. *Treatment codes used for all species in the Zimbabwe survey.*

Code	Treatment
1	Anthelmintics (drenches or injectibles)
2	Antibiotics, sulphur and other drugs
3	Bleeding (e.g. of ears etc.)
4	Cauterisation
5	Cleaning and disinfection (e.g. wounds, mange)
6	Dipping / tick-grease / DDT
7	Hot / cold compress
8	Indigenous treatment (e.g. herbs, aloes, salt)
9	Oil, paraffin
10	Vitamin injection
n/a	Vaccination[a]

[a] This needs to be coded under Question 3 on the same page of the questionnaire: 'Vaccinations / preventive treatments given'.

Vaccinations are not included among the treatments (Table 8.1). If a vaccination is entered under 'Treatments given' in Question 2 of the Health form (see section 4.6 of Chapter 4) this should be transferred by the database supervisor to Question 3 and coded there.

Codes for enumerator, supervisor, province, district, ward, etc. should be entered into the appropriate table in the computer system (Table 7.1) prior to the start of data entry. This needs to be coordinated by the database supervisor.

Table 8.2. *Disease codes used in the Zimbabwe survey that are general to all species.*

Code	Disease	Symptoms
1	Anaplasmosis / gall sickness / 'inyongo' [a]	Pale mucus membranes, difficulty in defecation
2	Anthrax	Sudden death, black tar-like blood from orifices
3	Babesiosis (Red Water)	Bloody urine
4	Diarrhoeal disease / *E. coli*, salmonella, etc.	Blood-stained diarrhoea, whitish-yellow diarrhoea
5	Foot & mouth	
6	Foot rot / foot problems / lameness	
7	Heart water	Nervous signs, high-stepping gait, blinking & twitching of eyes
8	Liver fluke	
9	Mastitis	Swollen udder
10	Pasteurellosis	Weak laboured breathing, depression, pus-like nasal discharge, nose crusting
11	Pneumonia / respiratory disease	Abnormal breathing, weakness, high fever
12	Quarter evil / blackleg / 'umkono' / 'igazi'	Swollen limbs, limping
13	Rift Valley fever	High fever, lack of co-ordination, collapse, sudden death
14	Tick-borne disease (unspecified)	
15	Trypanosomosis	Pale mucus membranes, emaciation
16	Worms (general) / helminthiasis	
17	Abscess / wounds (e.g. caused by ticks)	
18	Arthritis	
19	Bloat	
20	Dystocia	
21	Eye problems	
22	Lumpy skin disease ('amaqubuqubu')	
23	Mange / ectoparasites	Hair loss, flakes
24	Poisoning (plant, insects, etc.)	
25	Rabies	Nervous signs, sexual excitement, salivation
26	Retained after-birth	
27	Ring worm	
28	Sweating sickness	Sweating
29	Tetanus	
30	Three - day sickness	
31	Vibriosis	
32	Warts	

[a] Words in inverted commas are from a local language.

Table 8.3. *Disease codes used in the Zimbabwe survey defined specifically for different species.*

Code	Disease	Symptoms
Cattle		
41	Botulism	
42	Brucellosis (*Brucella* abortion)	Late pregnancy abortion
43	Theileriosis / East Coast fever	Enlargement of lymph nodes, difficulty in breathing
Sheep & Goats		
51	Blue tongue	Tongue blue
52	Contagious abortion	
53	Gid / 'chimeme' [a]	
54	Orf	
55	Pulpy kidney /enterotoxaemia	Rye neck (isimeme), nervous signs
Pigs		
61	Atrophic rhinitis	Laboured breathing, weakness
62	Aujesky's disease	
63	Clostridium perfingens	
64	Oedema disease	Unthrifty appearance
65	E. rhusiopathie	
66	Eryspelas	Raised diamond patches on skin
67	Greasy pig disease	Oily skin
68	Infectious arthritis	Swollen joins
69	Measles (cysts, endoparasites) / 'kondema'	
70	Meningoencephalitis	Nervous signs
71	Porcine parvo	
72	PRRSV	
73	Sarcoptes scabei guis	Scruffy dry skin
74	Swine dysentery	Diarrhoea
Chickens		
81	External parasites	
82	Fowl pox	Lumps on the head
83	Gumboro disease	Sleeping appearance
84	Infectious bronchitis	Gasping, eyes watering, facial swelling
85	Infectious bursal disease	Diarrhoea, soiling of vent, vent pecking
86	Infectious corrhiza	
87	Marek's disease	Paralysis of wings and legs
88	Mycoplasmosis	Swelling of head, watery nasal discharge
89	Newcastle disease	Sudden death, nervous signs (isipupupu)
90	Coughing - general	
Donkeys		
101	African horse sickness,	Laboured breathing, severe coughing
102	Biliary (tick-borne diseases)	Anaemic, laying down, blood in urine
103	Equine flu	Persistent coughing, nasal discharge
104	Otitis	

[a] Words in inverted commas are from a local language.

Table 8.4. *Breed codes used in the Zimbabwe survey.*

Species	Code	Breed	Species	Code	Breed
Cattle			Goats		
	1	Nkole (Nguni) / 'Umswati' [a]		1	Mashona / East African
	2	Tuli		2	Matebele / Saiboko
	3	Mashona / 'Umnjanja'		3	Boer
	4	Afrikaner		4	Alpine
	5	Brahman		5	Saanen
	6	Hereford		6	Angora
	7	Aberdeen Angus		7	Blue goat – Matebele
	8	Simmental		8	Iminwe – Matebele
	9	Limousin		9	Chitowa
	10	Charolais		10	Mamvanda (woolly)
	11	Jersey		11	Unknown cross
	12	Friesland			
	13	Holstein	Pigs		
	14	Ayrshire		1	Mukota
	15	Red Dane		2	Large white
	16	Red Poll		3	Landrace
	17	Guernsey		4	Loughborough
	18	Norwegian Red		5	Duroc
	19	Santa Gertrudis		6	Hampshire
	20	Brown Swiss		7	Mukota (white)
	21	Bonsmara		8	Unknown cross
	22	Sussex			
	23	Tonga	Chickens		
	24	Matebele		1	Perma
	25	Unknown cross		2	Chizizi / Hanga / Isikhova
	26	Mashona (multi-colour)		3	Naked neck
	27	Beefmaster		4	India
	28	Salers		5	Indigenous (all colours)
				6	White (with single comb)?
Sheep				7	Leghorn
	1	Sabi		8	Bantam
	2	Blackhead Persian		9	New Hampshire
	3	Dorper		10	White (with rose comb)?
	4	Merino		11	Mpunyu / Chimbira (tailess)
	5	Suffolk		12	Harco (black layer)
	6	Blackhead sheep (indigenous)		13	Tererine
	7	Wiltiper		14	Rukodzi / Chidota
	8	Wiltshire		15	Bhibho
	9	Chitowa		16	Matsatsa
	10	Unknown cross		17	Chideya / Chinheya
				18	Mbangwe
Donkeys				19	Chidhadha
	1	Indigenous		20	Unknown cross
	2	White (Egyptian?)		21	Rogo
				22	Black crest

[a] Words in inverted commas are from a local language.

CHAPTER 9

Standard output summary tables

9.1 Introduction

The Access software contains a facility, known as 'Queries', which allows simple summary tables to be produced. Before proceeding to Chapter 10, which gives a more detailed and rigorous approach to data analysis, it will be helpful to describe some of the standard queries included within the database system itself that have been designed to provide simple summary tables that the user can immediately produce by the press of a button. A summary of those currently available is included in the Appendix to this chapter (section 9.8) with a subset of them, as listed in Table 9.1, described here. These can be examined in more detail by opening Breedsurv.

The main purpose for providing such standard tables within the system itself is to allow a user who is not familiar with the Access software to have easy access to the data. The aim of this chapter is to illustrate, for each of the queries in Table 9.1, which database files (tables) need to be used and how they are accessed in order to extract the required information. Simple interpretations of some of the results contained in each table are also given. These must not be taken as final results, since, as described in Chapter 10, the data used in this report from Phase 1 of the Zimbabwe survey are data that had not been fully verified at the time the analysis was done. Hopefully the development of these simple summary tables will also assist experienced Access users to generate other output tables.

9.2 Standard tables derived from the HOUSEHOLD file

9.2.1 Numbers of animals reported for different species

These are obtained by summing the answers to Question 9 on Page 1 of the questionnaire (see Appendix 1) which are contained in the HOUSEHOLD file (see Fig. 7.1 of Chapter 7). The output table (Table 9.2) contains the total numbers of livestock recorded, classified by province. Provinces are coded as 1: Mashonaland Central; 2: Mashonaland East; 3: Matebeleland North; and 4: Matebeleland South. Adding up the numbers in each column gives totals, throughout the four provinces, of 18,726 cattle, 2,971 sheep, 14,198 goats, 22,424 chickens, 1,285 pigs and 2,813 donkeys recorded in the sample of 1,350 households. The variations in numbers of species kept per household across the provinces can be seen from this table.

9.2.2 Numbers of households keeping different species

These are slightly trickier to obtain and need to be done in two stages. Figure 9.1 illustrates, for example, the step that retrieves the number of households that keep cattle. The restriction > 0 (see the cat_no column in Fig. 9.1) needs to be applied for each

species in turn in order to count only those households that possess that species. Intermediary tables (Household_cattle, Household_chickens etc. – see Table 9.1) are, therefore, first obtained to give the number of households keeping each species.

Table 9.1. *List of a number of the Access queries stored in Breedsurv illustrated in this chapter. To view the contents of these queries in more detail the reader should open the queries in Breedsurv. Additional queries are shown in section 9.8.*

Name[a]	Description[b]
Hlth_one_ecto_control_crosstab	!Methods for ectoparasite control – used for Hlth_all_ecto_control_methods
Hlth_one_ecto_control_methods	Methods of ectoparasite control – reformatted.
Household_cattle	!Households with cattle – used for Households_species
Household_chickens	!Households with chickens – used for Households_species
Household_donkeys	!Households with donkeys – used for Households_species
Household_goats	!Households with goats – used for Households_species
Household_heads_age	Ages of household heads
Household_heads_gender	No. female/male household heads
Household_livestock_numbers	Numbers of livestock recorded
Household_pigs	!Households with pigs – used for Households_species
Household_sheep	!Households with sheep – used for Households_species
Household_species	No. households with cattle, sheep, goats, pigs, chickens, donkeys
Household_tribe	Cross-tabulation of tribe by province
Mat_breed_source_males	Sources of males used for breeding
Mat_cast_reasons	Reasons for castration
Phen_pure_crosstab	!Lists breeds recorded within households – used for Phen_pure_no_breeds
Phen_pure_no_breeds	Numbers of households with 1,2 or 3 pure breeds
Phencat_phen_breed_crosstab	!Cross-tabulation by breed of phenotypic details – used for Phencat_phen_no_breeds
Phencat_phen_no_breeds	Numbers of households with phenotypic details for different breeds
Prod_sys_own_livestock_ownership	Members of household who own livestock by gender of head
Prod_sys_own_primary	Numbers of households sampled for a primary species
Prod_sys_own_system	Systems of production by species
Prod_water_frequency_dry	Watering frequency - dry season
Prod_water_frequency_wet	Watering frequency – wet season

[a] Each name begins with the name of the source file (table) providing the data (see Fig. 7.1and Tables 7.4a and b in Chapter 7). Lower case letters are used to distinguish queries from the main Access database tables of Breedsurv which are written in upper case.

[b] A ! preceding the description means that the table produced is not the end result but an intermediary one used in the derivation of the final table.

Table 9.2. *Results contained in the query table 'Household_livestock_numbers' (see Table 9.1) giving the numbers reported for each of the six species.*

Household_livestock_numbers : Select Query

Province	Households	Cattle	Sheep	Goats	Pigs	Chickens	Donkeys
1	322	3092	299	1087	94	4228	6
2	322	6355	454	1677	697	8210	126
3	371	4650	726	4431	200	5699	1093
4	335	4629	1492	7003	294	4287	1588

Record: 1 of 4

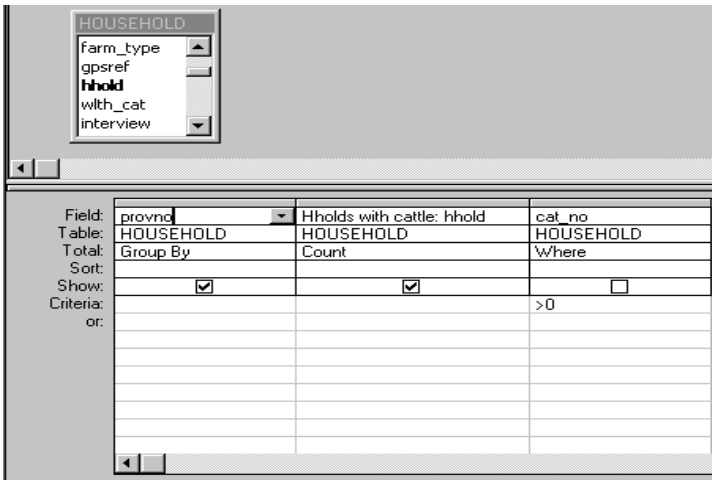


Fig. 9.1. *Construction of the Household_cattle table using the Access query system; this is one of the tables contributing to the Household_species output table shown in Table 9.3.*

These tables are then linked together and columns taken from them and put together, as can be seen by opening the query Household_species in Breedsurv. This produces the tabular output in Table 9.3. Note that when generating this output table only the Household_species query needs to be clicked, not first the intermediary ones. In this chapter we are demonstrating how the Access queries are constructed and are, therefore, describing the intermediary ones too. The numbers of households and those with cattle are also shown in Table 10.1 of the next chapter.

Table 9.3. *Results contained in the query table 'Household_species' (see Table 9.1) which show how many of the 1,350 households sampled kept the different species.*

Province	Households	with cattle	with sheep	with goats	with pigs	with chickens	with donkeys
1	322	280	42	176	19	291	3
2	322	300	59	229	47	300	41
3	371	327	85	342	51	351	217
4	335	288	104	319	63	309	256

Table 9.3 shows that cattle and chickens are each found in approximately 90% of all households. Pigs are kept in over 10% of all households. The numbers of households with goats and donkeys appear to vary across provinces.

9.2.3 Gender and age of household heads

Gender and age attributes of household heads are shown separately. Table 9.4 shows the output table Households_heads_age which classifies household heads by age. This results from the use of the 'cross-tab' function shown in Fig. 9.2.

Table 9.4 shows that there is an even distribution of household heads by age. Approximately 20% of all household heads are less than 40 years of age and about 10% over 70 years of age. By opening in Breedsurv the Household_heads_gender query (see Table 9.1), created in a similar way but not shown here, the reader can see that on average a quarter of the household heads are female. The proportion is higher (about a third of households) in the two Matebeleland provinces than in the two Mashonaland provinces (about a fifth). This difference may be due to husbands in the Matebeleland provinces being attracted to work in nearby South Africa.

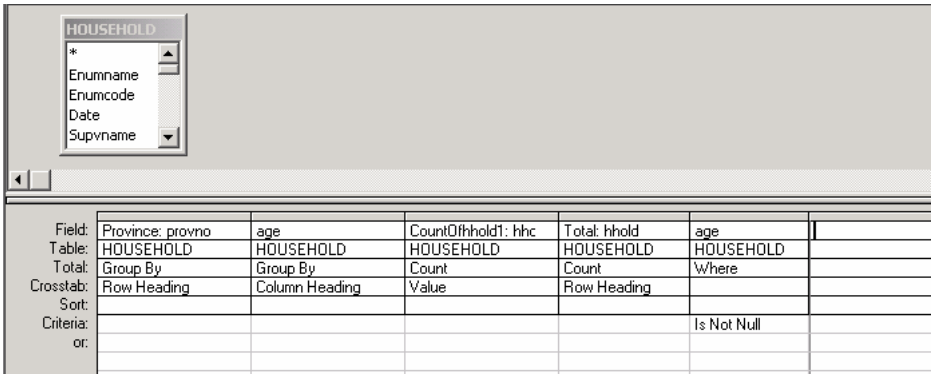
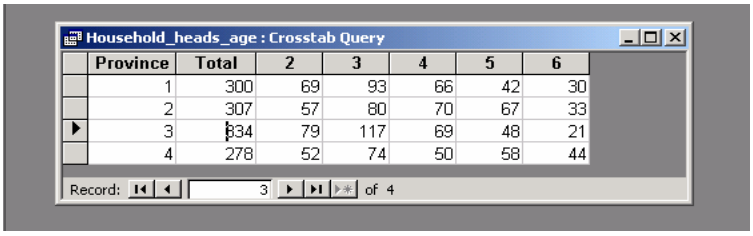


Fig. 9.2. *Use of the Access query cross-tab function for the construction of the 'Household_heads_age' table shown in Table 9.4.*

Table 9.4. *Distribution of numbers of household heads by age as stored in the query table 'Household_heads_age'.*


Household_heads_age : Crosstab Query

Province	Total	2	3	4	5	6
1	300	69	93	66	42	30
2	307	57	80	70	67	33
3	334	79	117	69	48	21
4	278	52	74	50	58	44

Record: 3 of 4

9.3 Standard tables derived from the production system files

As described in section 7.5.5 of Chapter 7, Access programs have been written to create new data files (or tables) that combine the information from different species (see Tables 7.4a and b of Chapter 7). Thus, for example, PROD_SYS_OWN contains, for all six species, data on system of production and members of the household who own livestock (Questions 1 and 4, respectively, on Page 2 of the questionnaire – see Appendix 1). In the generation of each of the above files the province number, retrieved from the HOUSEHOLD file, has also been inserted to simplify the creation of output tables classified by province. Many of the retrievals in a preliminary analysis are likely to be classified by an administrative category such as province.

9.3.1 Numbers of households with primary species

By using the PROD_SYS_OWN file, that combines information for all six species, a count of the number of households with records in the PRODCAT, PRODSHP etc. files can easily be obtained (Table 9.5). These are the numbers of questionnaires completed for each species as the primary species (see also Table 10.1 of the next chapter for cattle). Table 9.5 shows that cattle were most commonly recorded as the primary species in each province. The total numbers of questionnaires completed for each species as a primary species were 401 for cattle, 162 for sheep, 311 for goats, 96 for pigs, 282 for chickens and 167 for donkeys.

Table 9.5. *The 'Prod_sys_own_primary' table (see Table 9.1) which shows the numbers of questionnaires completed for each species as a primary species.*

PROVNO	CATTLE	CHICKEN	DONKEY	GOAT	PIG	SHEEP
1	120	79	3	81	15	29
2	94	72	29	75	26	31
3	96	72	63	84	28	56
4	91	59	72	71	27	46

9.3.2 Ownership of livestock species within the household

The PROD_SYS_OWN file can also be used to describe ownership of livestock species by province. Fig. 9.3 shows how, by linking the PROD_SYS_OWN file to the HOUSEHOLD file, the gender of the household head is retrieved to produce the output shown in Table 9.6. This table illustrates how cattle ownership rests primarily with the head of the household regardless of his or her gender (coded 1: male, 2: female). Ownership of chickens and pigs is distributed more evenly between the head of the household and his/her spouse regardless of the head's gender. Daughters account for approximately 20% of the household members who own chickens. When the head of the household is male he tends to be the primary owner of sheep and goats, but, when the household head is female, ownership is distributed more evenly between male and female members of the household. Sons account for about one sixth of owners of sheep and goats. Cattle ownership is analysed in more detail in section 10.4.1 of Chapter 10.

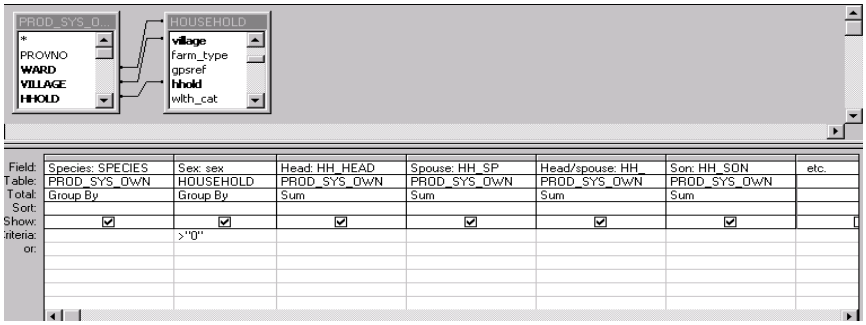


Fig. 9.3. *Construction of the 'Prod_sys_own_livestock_ownership' table shown in Table 9.6 illustrating how gender was retrieved by linking the PROD_SYS_OWN file to the HOUSEHOLD file.*

Table 9.6. *Ownership of livestock by member of household in the 'Prod_sys_livestock_ownership' query table categorised according to the gender of the household head (1: male; 2: female).*

Species	Sex	Head	Spouse	Head/spous	Son	Daughter	Other
CATTLE	1	250	26	30	25	7	12
CATTLE	2	55	11	15	14	2	2
CHICKEN	1	90	82	36	36	33	13
CHICKEN	2	21	37	9	16	14	3
DONKEY	1	78	6	11	9	1	1
DONKEY	2	25	14	2	6	2	0
GOAT	1	152	44	24	47	15	5
GOAT	2	34	25	17	9	6	4
PIG	1	40	22	8	2	3	2
PIG	2	9	8	1	2	2	1
SHEEP	1	86	7	13	14	4	4
SHEEP	2	14	7	4	10	2	0

9.3.3 System of production

By using the PROD_SYS_OWN table (see Table 7.4a in Chapter 7) the query Prod_sys_own_system (see Table 9.1) produces the results shown in Table 9.7. This table summarises the numbers of households raising their livestock under different systems of management. It can be seen that the majority of cattle were raised under extensive (or pastoral) systems except in Province 2 (Mashonaland East) where the majority were raised under semi-intensive systems. Similar patterns were evident for sheep, goats and donkeys. The majority of chickens were raised under free range/backyard systems, but again with some under semi-intensive systems, especially in Mashonaland East. Pigs were raised under intensive or semi-intensive systems or under free range/backyard systems.

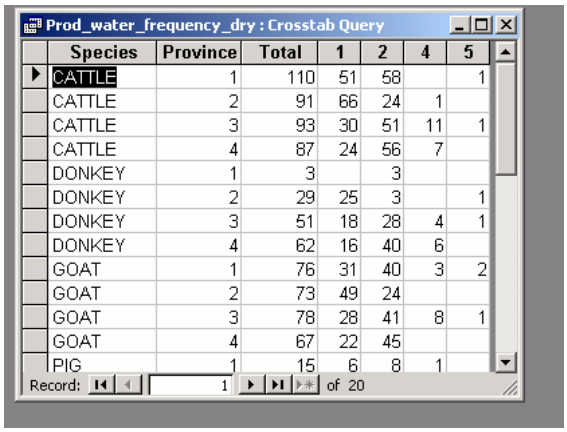
Table 9.7. *Production systems under which the different species were raised as stored in the query table 'Prod_sys_own_system'.*

Species	Province	Intensive	Semi_intensive	Extensive	Free /backyard	Other
CATTLE	1	0	2	117	0	0
CATTLE	2	9	58	24	0	0
CATTLE	3	3	8	82	0	1
CATTLE	4	1	6	79	1	0
CHICKEN	1	1	2		74	
CHICKEN	2	2	22		47	1
CHICKEN	3		8		59	1
CHICKEN	4	1	6		47	
DONKEY	1	0	0	3	0	0
DONKEY	2	6	16	6	2	0
DONKEY	3	0	4	48	0	0
DONKEY	4	1	7	54	0	0
GOAT	1	0	1	79	0	2
GOAT	2	10	44	15	5	0
GOAT	3	2	6	72	0	0
GOAT	4	2	4	61	0	0
PIG	1	3	7	0	3	1
PIG	2	6	5	0	15	0
PIG	3	3	15	0	10	0
PIG	4	2	14	0	4	5
SHEEP	1	0	0	29	0	0
SHEEP	2	3	20	5	3	0
SHEEP	3	1	3	47	0	0
SHEEP	4	1	5	34	0	0

9.3.4 Watering frequency

Data on watering frequency are contained in PROD_WATER (see Table 7.4a) for all species except chickens. Two tables have been generated separately for the dry and wet seasons using the 'cross-tab' function in Access (see queries Prod_water_frequency_dry and Prod_water_frequency_wet in Table 9.1). Table 9.8 demonstrates that water is mostly freely available or provided once a day to all species during the dry season. In a very few cases is water available only once in 3 days. During the wet season (Table 9.9) there is a slight shift to more frequent watering. Similar tables can be derived for the other questions associated with watering in order to provide a broader picture of water availability and distance walked (see section 9.8).

Table 9.8. *Frequency of watering in the dry season as contained in the query table 'Prod_water_frequency_dry' (Table 9.1).*


Prod_water_frequency_dry : Crosstab Query

Species	Province	Total	1	2	4	5
CATTLE	1	110	51	58		1
CATTLE	2	91	66	24	1	
CATTLE	3	93	30	51	11	1
CATTLE	4	87	24	56	7	
DONKEY	1	3		3		
DONKEY	2	29	25	3		1
DONKEY	3	51	18	28	4	1
DONKEY	4	62	16	40	6	
GOAT	1	76	31	40	3	2
GOAT	2	73	49	24		
GOAT	3	78	28	41	8	1
GOAT	4	67	22	45		
PIG	1	15	6	8	1	

Record: 1 of 20

Table 9.9. *Frequency of watering in the wet season as contained in the query table 'Prod_water_frequency_wet' (Table 9.1).*

Prod_water_frequency_wet : Crosstab Query

Species	Province	Total	1	2	4	5
CATTLE	1	113	71	42		
CATTLE	2	87	80	7		
CATTLE	3	93	66	25	1	1
CATTLE	4	87	40	47		
DONKEY	1	3	3			
DONKEY	2	29	25	4		
DONKEY	3	51	34	16	1	
DONKEY	4	62	24	32	5	1
GOAT	1	78	46	30	2	
GOAT	2	72	51	21		
GOAT	3	76	56	18	2	
GOAT	4	67	33	34		
PIG	1	15	6	8	1	
PIG	2	26	10	16		

Record: 20 of 20

9.4 Standard tables derived from the health files

HLTH_ONE and HLTH_TWO summary files have been defined to merge Questions 1-4, for all species, and Questions 5 and 6, omitting chickens, respectively (Table 7.4a of Chapter 7).

9.4.1 Ectoparasite control

The HLTH_ONE file can be used, for example, to determine the frequency of use of different methods of ectoparasite control for different species (Table 9.10). In practically all cases when cattle were treated for ectoparasites the method of control was through dipping. Rarely were cattle not treated. Sheep and goats, on the other hand, were not treated for ectoparasites in approximately 70-80% of households. Methods described in the households where these ruminants were treated were a mixture of dips, sprays and pour-ons. Traditional methods of treatment were also recorded in about 10% of the households where these species were kept (data not shown). Donkeys and pigs were generally not treated for ectoparasites, but chickens were often sprayed.

Table 9.10. *Methods used by different households for controlling ectoparasites contained in'Hlth_one_ecto_control_methods'.*

CATTLE	1	1	118		
CATTLE	2	2	80	9	
CATTLE	3	8	84		
CATTLE	4	4	80	1	1
CHICKEN	1	41		35	
CHICKEN	2	39		31	
CHICKEN	3	53		9	
CHICKEN	4	38		5	
DONKEY	1	3			
DONKEY	2	25		4	
DONKEY	3	40	1	5	2
DONKEY	4	60			
GOAT	1	70	1	3	4
GOAT	2	54	5	10	1
GOAT	3	56	7	2	1
GOAT	4	46	3	2	3
PIG	1	12		2	1
PIG	2	19		7	
PIG	3	24		2	
PIG	4	24			
SHEEP	1	13	11	3	1
SHEEP	2	20	6	3	1
SHEEP	3	33	5	2	4
SHEEP	4	24	4	2	

9.5 Standard tables derived from the castration/entries/exits/culling and breeding files

The data recorded on these two pages of the questionnaire (Page 6c and 7c for cattle, for example) are stored for each species together in one file, namely MATINCAT, MATINSHP etc. (see Fig. 7.1 of Chapter 7). As described in Chapter 7 (section 7.5.5) some questions on these pages have been merged across species. Thus, MAT_CAST contains the answers to Question 1 on Page 6 of the questionnaires for all species except chickens, and MAT_BREEDING contains the answers to Questions 3 and 4 on Page 7c for cattle, together with the answers to the corresponding questions on the pages for the other species (see Table 7.4a of Chapter 7, and Appendix 1).

9.5.1 Reasons for castration

The MAT_CAST file can be used to compare reasons for castration across species and provinces. Table 9.11 shows that the main reason for castration of cattle in the first three provinces was for better draft power (ticked one third of the time) followed by control of breeding, better temperament, improved meat quality and a better price for the animal. (Note that the question allows multiple answers.) In Matebeleland South answers were distributed fairly evenly across the categories. Reasons given for castration of sheep, goats and pigs tended to be for control of breeding and improved meat quality. Note that the answers 'Better price' and 'Better draft power' do not apply for these three species (see Table 7.4a of Chapter 7). They are not included in the list

for this question (see Appendix 1) and so zeros occur in Table 9.11. Columns of zeros, which occur in tables such as this, need to be treated with caution.

Table 9.11. *Reasons for castration contained in the query table 'Mat_cast_reasons' (Table 9.1).*

Species	Province	Breeding	Meat	Price	Draft	Temperament	Other	Total
CATTLE	1	86	58	20	111	65	6	346
CATTLE	2	49	19	31	76	27	5	207
CATTLE	3	52	39	38	71	50	3	253
CATTLE	4	57	43	52	53	37	5	247
DONKEY	1	0	0	0	0	1	0	1
DONKEY	2	11	0	0	0	13	9	33
DONKEY	3	12	0	0	0	26	10	48
DONKEY	4	25	0	0	0	40	5	70
GOAT	1	37	49	0	0	22	8	116
GOAT	2	27	34	0	0	5	7	73
GOAT	3	44	48	0	0	26	2	120
GOAT	4	45	48	0	0	32	9	134
PIG	1	7	7	0	0	0	2	16
PIG	2	2	7	0	0	1	3	13
PIG	3	13	14	0	0	5	1	33
PIG	4	11	12	0	0	5	2	30
SHEEP	1	7	9	0	0	4	2	22
SHEEP	2	11	6	0	0	1	1	19
SHEEP	3	28	29	0	0	15	1	73
SHEEP	4	28	25	0	0	12	5	70

9.5.2 Sources of males for breeding

The MAT_BREEDING file is used in this example to tabulate the sources of males used for breeding (Table 9.12). The majority of bulls used for breeding were to be found in the communal areas. About a third of matings were by the households' own bull(s) and the majority of these bulls were bred within the herds, not purchased. In the case of sheep and goats over half (approaching three quarters for sheep) of the matings were by the household's own rams and bucks, again usually bred, not bought. Eighty five percent of matings of sows were by the household's own boar. The majority of cockerels were bred within the flocks, not purchased.

Table 9.12. *Sources of males used for breeding contained in the query table 'Mat_breed_source_males' (see Table 9.1).*

Species	Province	Bred	Bought	Donated	Borrowed	AI	Communal
CATTLE	1	24	4	0	0	0	92
CATTLE	2	28	6	0	0	0	58
CATTLE	3	27	5	2	2	0	50
CATTLE	4	21	2	1	0	0	50
CHICKEN	1	47	5		15		
CHICKEN	2	59	7		5		
CHICKEN	3	43	8	1	6		
CHICKEN	4	36	4		5		
DONKEY	1						1
DONKEY	2	13	5				4
DONKEY	3	19	9				21
DONKEY	4	27	5				20
GOAT	1	40	4	0	0	0	33
GOAT	2	35	11	1	0	0	22
GOAT	3	30	2	0	0	0	34
GOAT	4	26	4	0	1	0	37
PIG	1	7	5	0	1		
PIG	2	11	6	0	5		
PIG	3	14	3	0	5		
PIG	4	9	1	0	3		
SHEEP	1	21	3	0	0	0	5
SHEEP	2	21	3	0	0	0	6
SHEEP	3	26	7	0	2	0	15
SHEEP	4	14	3	1	0	0	14

9.6 Standard tables derived from answers to the Breed/age/sex structure questionnaire form

These are stored in the data base as part of the PHENCAT, PHENSHP etc. files (Fig. 7.1 of Chapter 7). The answers to Questions 1, 2 and 4 for pure breeds of five of the species, excluding donkeys, are stored in PHEN_PURE, which also contains province number from the HOUSEHOLD file. PHEN_CROSSES combines the answers to Question 1 for the mixed crosses (excluding donkeys) and PHEN_AGE_SEX the questions on numbers by age and sex for both pure breeds and mixed crosses combined, but excluding chickens (see Table 7.4b of Chapter 7).

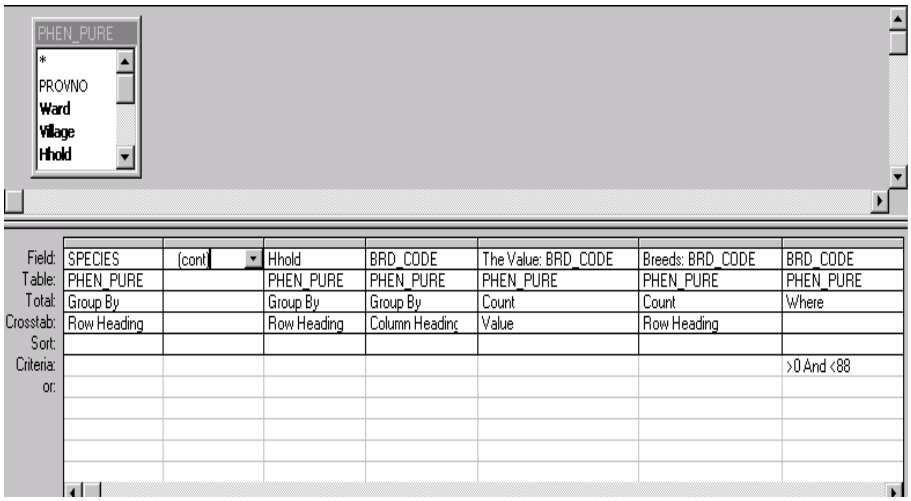
9.6.1 Numbers of pure breeds per household

These need to be calculated in two steps. To follow these steps the reader should open the appropriate queries in Breedsurv. Firstly the 'cross-tab' function is used to generate a 'Phen_pure_crosstab' query table in Breedsurv (Table 9.1), with species, province, ward, village and household as 'row headings' and breed code as a 'column heading' (Fig. 9.4).

Note that two additional columns (namely the last two columns shown in Fig. 9.4) are included in the design of this query. The first column counts the number of breeds in each household and includes it as an additional row heading; the second excludes crossbreeds (breed code 88 – see 7.5.4 of Chapter 7) from the table. This query table is then used to generate counts of numbers of pure breeds per household by using the

number of breeds counted in each household in the first table as a 'column heading' for grouping purposes for the second table (see Fig. 9.5). By opening and studying the Phen_pure_crosstab and Phen_pure_no_breeds queries in Breedsurv the reader will follow these steps more easily.

Fig. 9.4. *Illustration of the construction of the cross-tab table phen_pure_crosstab' in Breedsurv (see Table 9.1) with a count of the number of breeds per household included as a column heading. (Note that columns for province, ward and village have been manually deleted from this figure to allow other columns to be shown.) The output table is used as the source table for the query illustrated in Fig. 9.5.*



The output table (Table 9.13) shows that the majority of households with pure breeds only have one breed. The largest proportion of households with a second breed is for chickens. This is probably associated with the limited knowledge of breeds of chickens in Zimbabwe by the survey teams and the desire to collect as much information as possible on them. Further analyses of the data collected on chickens will provide a better understanding of the likely breed distribution in the country. It should be noted that the results in Table 9.13 include households that possess both pure breeds only and pure breeds with crossbreeds. A further analysis of these data which separates these two categories of households is given in Chapter 10 (Table 10.18).

Fig. 9.5. *Construction of the 'Phen_pure_no_breeds' table shown in Table 9.13 using the 'Phen_pure_crosstab' output table generated using the query illustrated in Fig. 9.4.*

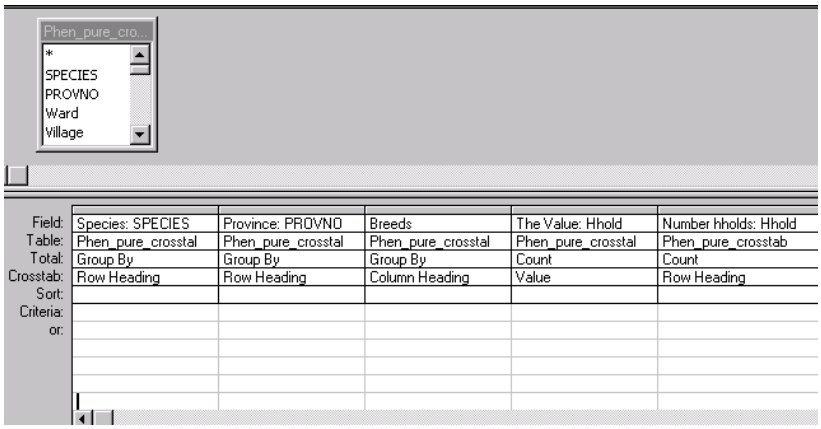


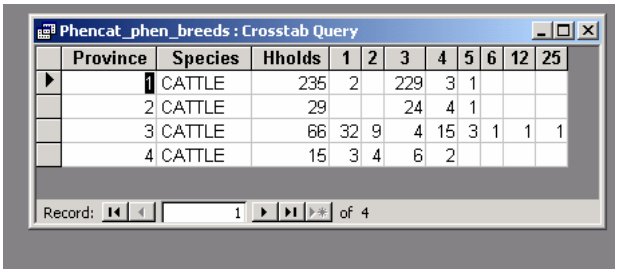
Table 9.13. *Table stored as 'Phen_pure_no_breeds' which demonstrates the numbers of pure breeds (1, 2 or 3) kept per household.*

Species	Province	Number hholds	1	2	3
CATTLE	1	256	250	5	1
CATTLE	2	50	43	7	
CATTLE	3	100	88	12	
CATTLE	4	28	28		
CHICKEN	1	156	119	35	2
CHICKEN	2	87	77	10	
CHICKEN	3	115	85	29	1
CHICKEN	4	85	68	16	1
GOAT	1	153	149	4	
GOAT	2	50	50		
GOAT	3	208	192	16	
GOAT	4	129	125	3	1
PIG	1	11	10	1	
PIG	2	24	24		
PIG	3	24	22	2	
PIG	4	4	4		
SHEEP	1	37	37		
SHEEP	2	32	30	2	

9.7 Standard tables for phenotypic description data

The questionnaire pages with phenotypic details are individually designed for each species. Statistical analysis of the data originating from these pages therefore needs to be done for each species separately. To count the numbers of questionnaires containing phenotypic data for the different breeds, however, the 'cross-tab' function 'Phen_cat_phen_no_breeds' (Table 9.1) can be used. This is applied to the PHENCAT_PHEN file for cattle (Table 7.4b) classified by province and breed to produce the results shown in Table 9.14. The table shows how many household records for cattle contain phenotypic details. Thus, there are 263 households with phenotypic data for Mashona (see Tables 10.23 and 10.25 in the next chapter), 37 for Nkole, 26 for Afrikaner, 13 for Tuli (see Tables 10.24 and 10.27 in the next chapter) and 5 for Brahman breeds. Tables for the other species can be obtained in a similar way.

Table 9.14. *Table stored in 'Phencat_phen_breeds' showing the numbers of phenotypic data obtained for the different breeds of cattle (1: Nkole, 2: Tuli, 3: Mashona, 4: Afrikaner, 5: Brahman, 6: Hereford, 12: Friesland, 25: Unknown cross (see Table 8.4 of Chapter 8).*



Phencat_phen_breeds : Crosstab Query

	Province	Species	Hholds	1	2	3	4	5	6	12	25
▶	1	CATTLE	235	2		229	3	1			
	2	CATTLE	29			24	4	1			
	3	CATTLE	66	32	9	4	15	3	1	1	1
	4	CATTLE	15	3	4	6	2				

Record: 1 of 4

9.8 Appendix: Library of query tables

Tables 9.15a and b list the retrieval queries stored in Breedsurv. These have been designed with the Zimbabwe survey in mind. The design of livestock breed surveys in other countries may differ. For example, different species may be included or only selected pages of the questionnaire. A person skilled in the use of Acess, however, should be able to modify the tables to meet the particular requirements.

Table 9.15a. *List of query standard summary tables stored in Breedsurv and based on data collected through Household, Production system or Health questionnaire pages (Appendix 1).*

Name[a]	Description
Hlth_one_disease	Frequency of different diseases classified by order reported
Hlth_one_treatment	Frequency of different treatments classified by order reported
Hlth_one_vaccination	Frequency of different vaccinations classified by order reported
Hlth_one_ecto_control_methods	Methods of ectoparasite control – reformatted.
Hlth_one_vet_access	Access to veterinary services
Household_heads_age	Numbers of household heads by age
Household_livestock_numbers	Numbers of livestock recorded
Household_livestock_rank	Importance of species kept
Household_size_no_livestock	Average number of livestock per household by size of households with livestock as major activity.
Household_source_income	Source of income by rank
Household_species	No. households with cattle, sheep, goats, pigs, chickens, donkeys
Household_tribe	Cross-tabulation of tribe by province
Household_tribe_species_pure_breed	Numbers of households owning different pure breeds by tribe.
Prod_grz_supp_graze/feed_dry	Frequency of different grazing/feeding systems in dry season
Prod_grz_supp_graze/feed_wet	Frequency of different grazing/feeding systems in wet season
Prod_grz_supp_supp_dry&wet	Frequency of different supplementation regimes by season
Prod_house_type_dry	Frequency of different types of housing in dry season
Prod_house_type_wet	Frequency of different types of housing in wet season
Prod_sys_own_livestock_ownership	Members of household who own livestock by gender of head
Prod_sys_own_primary	Numbers of households sampled for a species
Prod_sys_own_system	Systems of production by species
Prod_water_distance_dry	Distance to water in dry season
Prod_water_distance_wet	Distance to water in wet season
Prod_water_frequency_dry	Watering frequency – dry season
Prod_water_frequency_wet	Watering frequency – wet season
Prod_water_source_dry&wet	Source of water for each species in both seasons
Prodcat_purpose	Primary purpose for keeping cattle
Prodchk_purpose	Primary purpose for keeping chickens
Proddon_purpose	Primary purpose for keeping donkeys
Prodgt_purpose	Primary purpose for keeping goats
Prodpig_purpose	Primary purpose for keeping pigs
Prodshp_purpose	Primary purpose for keeping sheep
Prodcat_activity	Members of household responsible for cattle activities
Prodchk_activity	Members of household responsible for chicken activities
Proddon_activity	Members of household responsible for donkey activities
Prodgt_activity	Members of household responsible for goat activities
Prodpig_activity	Members of household responsible for pig activities
Prodshp_activity	Members of household responsible for sheep activities
Prodsys_own_ownership	Ownership of species by different members of household

[a] Each name begins with the name of the source table providing the data (see Fig. 7.1 and Tables 7.4a and b of Chapter 7). Lower case letters are used to distinguish queries from the main Access database tables of Breedsurv which are written in upper case.

Table 9.15b. *List of query standard summary tables stored in Breedsurv and based on data collected through Castration/entries/exits/culling, Breeding, Breed/age/sex or Phenotypic description questionnaire pages (Appendix 1).*

Name[a]	Description
Mat_breed_source_males	Sources of males used for breeding
Mat_cast_reasons	Reasons for castration
Mat_breeding_kept	Primary reasons for keeping males
Mat_breeding_mating	Reasons for mating
Mat_entries_exits_births	Numbers of births by species
Mat_entries_exits_deaths	Numbers of deaths in youngest category by species
Mat_entries_exits_entries	Types of entry for weaners and adults (W+A) by species
Mat_entries_exits_exits	Types of exit for weaners and adults (W+A) by species
Matingcat_breeding	Primary reason for choice of bulls for breeding
Matingcat_culling_females	Primary reason for culling/disposing of female cattle
Matingcat_culling_males	Primary reason for culling/disposing of male cattle
Matingchk_breeding	Primary reason for choice of cockerels for breeding
Matingchk_culling_females	Primary reason for culling/disposing of female chickens
Matingchk_culling_males	Primary reason for culling/disposing of male chickens
Matingdon_breeding	Primary reason for choice of male donkeys for breeding
Matingdon_culling_females	Primary reason for culling/disposing of female donkeys
Matingdon_culling_males	Primary reason for culling/disposing of male donkeys
Matinggt_breeding	Primary reason for choice of bucks for breeding
Matinggt_culling_females	Primary reason for culling/disposing of female goats
Matinggt_culling_males	Primary reason for culling/disposing of male goats
Matingpig_breeding	Primary reason for choice of boars for breeding
Matingpig_culling_females	Primary reason for culling/disposing of female pigs
Matingpig_culling_males	Primary reason for culling/disposing of male pigs
Matingshp_breeding	Primary reason for choice of rams for breeding
Matingshp_culling_females	Primary reason for culling/disposing of female sheep
Matingshp_culling_males	Primary reason for culling/disposing of male sheep
Phen_pure_no_breeds	Numbers of households with 1,2 or 3 pure breeds
Phen_crosses_no_breeds	Different breeds used for crosses
Phen_age_sex_structure_breed	Total age/sex structure for each species by breed except chickens
Phenchk_age_sex_structure_breed	Total sex structure for chickens by breed
Phencat_phen_breeds	Numbers of households with phenotypic details for cattle
Phenchk_phen_breeds	Numbers of households with phenotypic details for chicken
Phengt_phen_breeds	Numbers of households with phenotypic details for goats
Phenpig_phen_breeds	Numbers of households with phenotypic details for pigs
Phenshp_phen_breeds	Numbers of households with phenotypic details for sheep
Phencat_trait_quality	Quality of traits perceived by breed for cattle
Phenchk_trait_quality	Quality of traits perceived by breed for chickens
Phendon_trait_quality	Quality of traits perceived by breed for donkeys
Phengt_trait_quality	Quality of traits perceived by breed for goats
Phenpig_trait_quality	Quality of traits perceived by breed for pigs
Phenshp_trait_quality	Quality of traits perceived by breed for sheep

[a] Each name begins with the name of the source table providing the data (see Fig. 7.1 of Chapter 7 and Tables 7.4a and b). Lower case letters are used to distinguish queries from the main Access database tables of Breedsurv which are written in upper case.

CHAPTER 10

Data analysis

10.1 Introduction

Automatic methods for extracting data from the database through the Access system itself have been demonstrated in the previous chapter. This chapter builds on these preliminary methods to develop an approach to a comprehensive analysis that meets the goals of FAnGR surveys. These goals are summarised in Chapter 2, namely to document and characterise FAnGR in order to determine breed status, numbers and breed performance, and to contribute to their improved use and conservation. The primary focus of the analysis of livestock breed survey data must, therefore, be with these goals in mind. Using cattle for illustrative purposes the statistical analysis is approached in the following stages:

1. The importance and purpose of keeping cattle, their ownership and management within the household *(Tables10.1-9, 10.22 ; Figure 10.1).*

2. Estimates of cattle population numbers, herd structures and productivity in terms of cow fertility *(Tables 10.12-15, 10.20-21 ; Figures 10.2-3).*

3. Description of the environment in which the cattle live (in this analysis just disease is considered) *(Table*s *10.10-11).*

4. Estimates of breed composition, breed phenotypic description and perceptions of breed traits by farmers and their importance *(Tables 10.16-19, 10.23-30; Figures 10.4-6).*

The data analysis described here can only give a flavour of the types of analyses that can be done and, therefore, only goes some way to answering each of the goals set out above. As indicated in Chapter 9 data analysis will mostly begin with simple tabulations of data by province, or, as also considered in this chapter, by breed. In some cases the data are also classified here by district or ward to indicate possible approaches to more detailed statistical analysis. As in Chapter 9 data from four of the eight provinces sampled in Phase 1 of the survey in Zimbabwe will be used for purposes of illustration, namely, Mashonaland Central, Mashonaland East, Matebeleland North and Matebeleland South. When undertaking this analysis the 'table merger' macro (see section 7.5.5 of Chapter 7) had not been developed. The data analysis described in this chapter has, therefore, been performed using the data stored in the basic Breedsurv files HOUSEHOLD, PRODCAT etc. (see Fig. 7.1 of Chapter 7). Also, at the time of undertaking this analysis, data entry from the second phase of the survey had not been completed, neither had computer data entry from the first phase been verified. The results provided here must, therefore, not be taken as final ones. They are used simply to

illustrate the types of analysis that can be achieved. The results are presented mostly in tabular form in order to provide numerical values of means etc. In a few instances, however, graphs are also used to illustrate other forms of data presentation.

It also needs to be emphasised here that the checking and verifying of data does not, as described in Chapter 9, end at the data entry phase. One of the aims of preliminary analysis of data is to identify inconsistencies and possible errors in the data and to decide on steps to be taken to overcome these problems. Some examples will also be given during the course of this chapter showing how it is necessary to go back to the raw data to investigate data inconsistencies. As already mentioned, cattle will be used to illustrate the methods of analysis. However, the methods are in the main generic to all species.

10.2 Numbers of households

Table 10.1 provides details of the numbers of households sampled in the four provinces, the numbers of these households that possessed cattle, the numbers selected for interview for cattle as the primary species and the numbers that provided information on cattle as a secondary species. As indicated in the footnote of Table 10.1 some of these results have already been shown in Chapter 9. It is important to appreciate at the outset that the design of the survey (see section 3.1 of Chapter 3) resulted in certain data being collected for cattle, both as a primary and a secondary species (e.g. herd structure – see Appendix 1) and some only as a primary species (e.g. disease). Phenotypic data were sometimes, but not always, collected for the pure breeds when they were recorded as a primary or a secondary species. Table 10.1 includes the numbers of households that provided information on pure breeds (Page 8c of the questionnaire) and, of these, those for which phenotypic data (Page 10c) were collected too.

Table 10.1. *Summary of numbers of households and information recorded on cattle.*

	Province				
	Mash. C	Mash. E	Mat. N	Mat. S	Total
No. of households sampled [a]	322	322	371	335	1350
No. keeping cattle [a]	280	300	327	288	1195
No. recorded with cattle as primary species [b]	120	94	96	91	401
No. recorded with cattle as secondary species [b]	146	193	160	100	599
No. providing information on pure breeds [c] of cattle [d]	256	50	100	28	434
No. providing phenotypic details for pure breeds	236	29	65	15	345

[a] Shown also in Table 9.3 of previous chapter.
[b] These are the primary species, shown also in Table 9.5, and secondary species as defined for the purposes of the questionnaires.
[c] Shown also in Table 9.13 of Chapter 9.
[d] Some of these households also had crossbred cattle.

This first table summarises the basic data that have been collected and is an important platform for developing the approach to statistical analysis. For example, averaging over all provinces, 89% of households possessed cattle – the other 11% kept sheep or

goats, but not cattle. Eighty four percent of households sampled provided data on cattle but less than half of these were as a primary species. Data on pure breeds varied in quantity across the provinces, and few households, for instance, kept purebred cattle in Matebeleland South. This reflects the extent of crossbreeding in this province.

10.3 Importance of livestock and their ownership

10.3.1 Importance of livestock

So what importance do livestock play in the households and how important are cattle? Using the data provided in Question 8 on Page 1c of the questionnaire, Table 10.2 shows the relative importance of livestock and their products, crops and home industries to the income of the households in the four provinces in Zimbabwe. In order to summarise the ranks given as 1, 2 and 3 in the questionnaire an index has been calculated for each source of income as follows:

> Index = sum of [3 for rank 1 + 2 for rank 2 + 1 for rank 3] for a given source of cash Income for households in a province divided by sum of [3 for rank 1 + 2 for rank 2 + 1 for rank 3] over all four sources of income in the same households.

The index adds up to 1 in each column (see Table 10.2) and the higher the value of the index the greater the importance of the income it represents. Thus, as the table shows, crop-livestock systems feature throughout the four provinces. However, there is a greater emphasis on livestock in the two Matebeleland provinces. Home industries also feature more in the Matebeleland provinces and Mashonaland East than Mashonaland Central. Sources of income given under 'other' in Table 10.2 were not specified in Phase 1 of the survey, but they are in Phase 2.

Table 10.2. *Ranking of cash income by province.*

	Province			
Cash income	Mash. C.	Mash. E.	Mat. N.	Mat. S.
Livestock	.35[a]	.36	.44	.45
Crops	.53	.46	.39	.32
Home industries	.04	.09	.10	.09
Others	.09	.09	.07	.14

[a] Index = sum of [3 for rank 1 + 2 for rank 2 +1 for rank 3] for a given source of cash income divided by sum [3 for rank 1 + 2 for rank 2 +1 for rank 3] for all sources of cash income for a province.

The method of calculating an index provides a useful summary of the data. This method is also applied to the ranking of the most important species of livestock – Question 9, Page 1c (see Table 10.3) – and to other ranked data later. Table 10.3 demonstrates the importance of cattle and goats to the households across all four provinces. Chickens also assume importance in the two Mashonaland provinces and donkeys in the two Matebeleland provinces. Sheep were ranked low throughout.

An alternative way for presenting the data analysed in Table 10.3 would be to calculate the percentage of times when cattle were owned that they were ranked 1,

ranked 2, ranked 3, and not ranked – likewise for sheep, goats etc. – and present the results in the form of a 3-way table by rank (1,2,3), species and province.

Both methods, this and the 'index' method, should give the same indication of the importance of the different species to the farmer. For the remainder of this chapter, however, the 'index' method will be used.

Table 10.3. *Household ranking of the importance of livestock by province.*

	Province			
Species	Mash. C.	Mash. E.	Mat. N.	Mat. S.
Cattle	.49	.49	.44	.39
Goats	.20	.22	.25	.27
Chickens	.25	.21	.10	.08
Donkeys	.00	.02	.16	.21
Sheep	.04	.04	.03	.03
Pigs	.01	.03	.02	.02

[a] See footnote to Table 10.2 for method of calculation of index.

10.3.2 Purpose of keeping animals

Cattle ranked highest in importance (Table 10.3). So to what purpose are they put? The same method for calculating the index used in Table 10.3 is used for these data. A similar index was calculated to summarise the data given on perceived importance (see Question 3, Page 2c of questionnaire), but since additional ticks were provided for this question that were not included among the ranks 1, 2, and 3, the weights used in this index were slightly different, namely, 4 for rank 1, 3 for rank 2, 2 for rank 1 and 1 for a tick.

Table 10.4 shows that cattle are used for a variety of purposes. Work was ranked highest (average index 0.22) followed by breeding (0.17), cash (0.16), milk (0.15) and meat and manure (0.09).

The question on the purpose of keeping cattle was asked separately for male and female cattle in Phase 1 of the survey in Zimbabwe, but the question is combined for both genders in Phase 2 (see Question 3, Page 2c of questionnaire). In order to allow the data to be combined later for the analysis of all eight provinces together, the answers given to this question in Phase 1 were pooled across males and females. Any tick or rank given for either sex was included in the pooled rank. If the same purpose was ranked 1,2 or 3 for both sexes then the higher of the two ranks was taken.

In interpreting the results in Table 10.4 it should also be noted that a slight misalignment of the boxes in the questionnaire used for Phase 1 may have caused some confusion in the answers given, especially for meat and milk. The data base supervisor arranged to check the answers given to ensure that the correct information is entered into the database for subsequent analysis.

In order to obtain an indication of the possible statistical significance of the differences among the provinces, average indices for three purposes of keeping cattle, namely work, breeding and culture were calculated at the ward level. The variation in mean responses among provinces was compared by analysis of variance with that among districts within provinces. When this was done, significant differences among provinces were found in relation to culture ($P<0.001$), work ($P<0.01$) and breeding

(P<0.05). Thus, the greater importance, for instance, attached to culture by households in Mashonaland Central (Table 10.4) was of statistical significance. Likewise, the lower importance attached to work in Matebeleland South relative to other provinces (see Fig. 10.1) and the difference in importance attached to breeding between the two provinces of Mashonaland East and Matebeleland North and the two provinces of Matebeleland Central and Matebeleland South (see Table 10.4) were statistically significant.

Table 10.4. *Purpose of keeping cattle by province.*

	Province				
Purpose	Mash. C.	Mash. E.	Mat. N.	Mat. S.	Mean
Work	.24 [a]	.22	.24	.19	.22
Breeding	.14	.19	.19	.16	.17
Cash	.14	.15	.15	.19	.16
Milk	.13	.15	.15	.16	.15
Meat	.09	.10	.09	.09	.09
Manure	.10	.09	.07	.11	.09
Investment	.05	.03	.03	.03	.04
Dowry	.03	.02	.03	.03	.03
Culture	.06	.02	.01	.01	.02
Hide	.01	.01	.03	.02	.02
Ceremonies	.01	.00	.01	.01	.01
Blood	.00	.01	.00	.00	.00

[a] Index = sum of [4 for rank 1 + 3 for rank 2 + 2 for rank 3 + 1 for tick] for a given purpose divided by sum [4 for rank 1 + 3 for rank 2 + 2 for rank 3 + 1 for tick] for all purposes for a province.

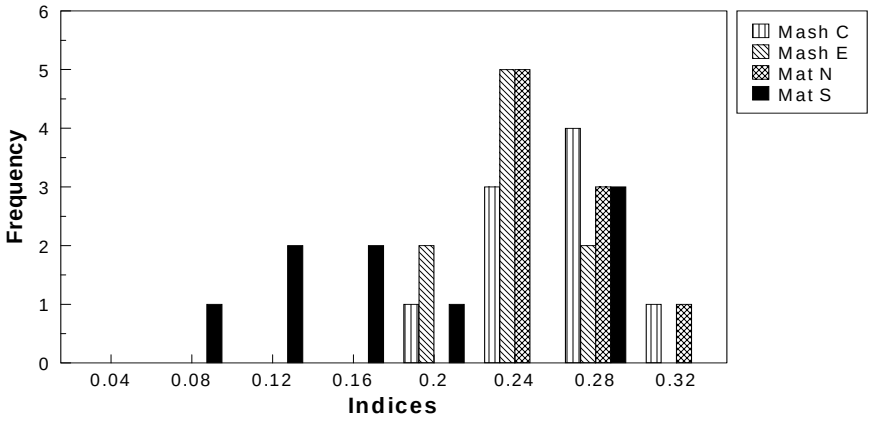


Fig. 10.1. *Distribution of indices for the purpose of keeping cattle for work by district within province. For definition of indices see footnote to Table 10.4.*

10.4 Ownership and responsibilities for animals

10.4.1 Ownership

Table 10.5 shows the distribution (derived from the data collected for Question 4, Page 2c of the questionnaire) of the ownership of cattle within the household in each province. A table of frequency counts is available among the Access queries described in Chapter 9 (see Table 9.6). The analysis a developed here a little further and classifies the households into those which have single or mixed ownership of cattle.

Ownership was shared within the household in an average of about an eighth of households [(451-401)/401]. This appeared to be more so when the household head was female rather than male (Table 10.6). When the head of the household was male he himself owned all the cattle in 71% (218/309) of households. This compares with 56% (50/90) when the head of the household was female (Table 10.6). This difference is statistically different by a χ^2 test ($P<0.001$). Ownership of cattle was shared between the household head and his/her spouse in 11% of households (Table 10.5). Sharing of ownership appeared to be most common in Matebeleland North.

Table 10.5. *Distribution of cattle ownership within households.*

	Province				
	Mash. C	Mash. E.	Mat. N.	Mat. S.	Total
Number of households	120	94	96	91	401
Number of categories of ownership [a]	133	109	111	98	451
Percentage of households with ownership by:					
Head (%)	*82*[b]	*74*	*72*	*76*	*76*
Spouse (%)	*6*	*18*	*10*	*4*	*9*
Head/spouse together (%)	*11*	*6*	*17*	*11*	*11*
Sons (%)	*6*	*11*	*11*	*12*	*10*
Daughters (%)	*2*	*2*	*2*	*3*	*2*
Others (%)	*5*	*4*	*3*	*1*	*3*

[a] The ownership categories are listed in the table. More than one category was involved in some households
[b] Percentages are given in italics to distinguish them from frequencies. These are the percentages of households in which a particular category of ownership occurred. Thus the percentages in a column do not add up to 100%.

Table 10.6. *Cattle ownership in relation to gender of head of household.*

	Gender of household head		
	Male	Female	Total
No. of households	309	90	399[a]
Ownership:			
Head only	218	50	268
Shared with spouse only	24	12	36
Spouse only	6	6	12
Sons or daughters only	10	7	17
Mixed [b]	92	24	116
Total	350	99	449

[a] Gender not specified in two of the 401 households.
[b] Cattle owned by different combinations of household members.

10.4.2 Responsibilities

Male and female responsibilities for different cattle activities (see Question 5, Page 2c of questionnaire) are shown in Table 10.7. In over 80% of households adult males were involved in purchasing and selling of cattle. Adult females were involved in these activities in over 30% of households. A proportion of respondents did not answer the questions on breeding, presumably reflecting a reliance on random mating of their cows with bulls in the community. Similarly, only a proportion of respondents answered the question on feeding, indicating that some households did not feed additional supplements. The manufacturing and selling of dairy products was primarily in the hands of adult female members of the household. This, however, was done in only half of the households. Boys were involved in milking in about one third of all households (Table 10.7).

Table 10.7. *Cattle activity by gender in 401 households across the four provinces that completed Question 5 on Page 2c of the questionnaire (see Appendix 1).*

Activity	Households involved in activity (n)	Percentage of households			
		Adult males	Adult females	Boys	Girls
Purchasing	384	*88* [b]	*31*	*1*	*<1*
Selling	365	*88*	*36*	*2*	*<1*
Herding	371	*54*	*20*	*50*	*5*
Breeding	307	*86*	*18*	*7*	*<1*
Feeding	284	*74*	*24*	*23*	*2*
Milking	357	*59*	*28*	*38*	*4*
Making dairy products	192	*11*	*88*	*5*	*2*
Selling dairy products	148	*16*	*82*	*6*	*4*

[a] Sometimes more than one category of adult males, adult females, boys and girls within a household are involved in the same activity. Thus, percentages do not add up to 100%.
[b] Percentages are given in italics to distinguish them from frequencies.

In order to examine any variation among provinces, the number of households in which adult females were involved in herding of cattle and in making and selling of dairy products is tabulated by province in Table 10.8. Assuming the selection of wards was random and their variation within provinces homogeneous, the numbers shown in Table 10.8 can be used in χ^2 tests applied to 4 x 2 tables, classified by involvement versus non-involvement of females, to compare differences across provinces. Level of herding activity was significant ($P<0.001$) reflecting a greater involvement of adult females in herding cattle in Mashonaland East than in the other provinces. There were no significant variations in the making or selling of dairy products, indicating the prominent role played by females in this activity throughout all four provinces. The highest proportion of households involved in the manufacturing of dairy products was in Matebeleland North, namely 67% (64/96 x 100 – see Table 10.8).

Table 10.8. *Percentage adult female involvement in herding and making and selling of dairy products.*

	Province			
	Mash. C.	Mash. E.	Mat. N.	Mat. S.
Number of households	120	94	96	91
Percentage with adult females undertaking activity:				
Herding	*18* [a] (116) [b]	*34* (85)	*10* (89)	*19* (81)
Making dairy products	*90* (50)	*88* (32)	*84* (64)	*89* (46)
Selling dairy products	*79* (56)	*91* (34)	*76* (34)	*83* (24)

[a] Percentages given in italics.
[b] Numbers of households for which activity was ranked by household in parentheses.

10.5 Feeding and disease management

10.5.1 Supplement feeding

Table 10.9 uses data collected for Question 10, Page 3c of the questionnaire (see Appendix 1) to provide details by province of the percentages of households feeding supplements to cattle in dry and wet seasons. An average of 83% of households in the two Mashonaland provinces fed supplements during the dry season. This compares with an average of 58% of households in the two Matebeleland provinces. The average of about 70% is less than the 84% of households (345/401 – see Table 10.7) that reported some form of participation of household members in feeding the cattle. This difference may be associated with the cutting and carrying of grass as feed. The majority of supplementation was in the form of roughage (average 82%), followed by minerals (average 21%). Forty three per cent of households in Matebeleland South fed bought-in-feed (Table 10.9). A very much smaller percentage of households fed supplementary feed during the wet season (on average 11%).

10.5.2 Disease and vaccination against disease

So far we have gained an understanding of how cattle are managed and fed. But under what environmental conditions do the cattle live? This will be illustrated here by summarising from Questions 2 and 3 on Page 4c of the questionnaire (see Appendix 1) the important prevalent diseases reported by farmers in the four provinces sampled in Phase 1 of the survey in Zimbabwe and the diseases which were vaccinated against.

Table 10.10 demonstrates that the prevalence of Quarter Evil, the disease most commonly reported across the four provinces, ranged from 34% of households reporting diseases by name in Mashonaland Central to 95% in Matebeleland South. This was followed by Lumpy Skin disease (average 23%) and, in Mashonaland Central and Mashonaland East, Babesiosis / Red Water (average 36%). Vaccinations against Quarter Evil were given in an average of 58% of households in the Matebeleland provinces and 18% in the Mashonaland provinces, in both cases about half the number of households that reported the disease. No information on disease was offered by 18% of households,

but it is not clear whether this meant that no disease occurred on the farm or whether the question was simply not answered. In Phase 2 of the survey it will be easier to describe this category since the question has been rephrased to distinguish between those households where no disease is present and those providing no information.

Vaccinations were also given against Anthrax, Foot and Mouth and Lumpy Skin disease in a few households (Table 10.10).

Table 10.9. *Percentages of households feeding supplements during dry and wet seasons.*

	Province			
	Mash. C.	Mash. E.	Mat. N.	Mat. S.
Number of households	120	94	96	91
Percentage feeding supplements (dry season)	*81*	*85*	*58*	*59*
(wet season)	*13*	*12*	*5*	*13*
Number feeding supplements (dry season)	97	80	56	54
Percentage feeding roughage	*87*[a]	*85*	*84*	*72*
Percentage feeding minerals	*14*	*34*	*29*	*9*
Percentage feeding bought-in-feed	*1*	*8*	*12*	*43*
Percentage feeding other rations	*19*	*4*	*0*	*2*
Number feeding supplements (wet season)	16	11	5	12
Percentage feeding roughage	*31*	*45*	*40*	*25*
Percentage feeding minerals	*19*	*45*	*40*	*8*
Percentage feeding bought-in-feed	*6*	*18*	*20*	*67*
Percentage feeding other rations	*50*	*9*	*20*	*8*

[a] Percentages appear in italics to distinguish from frequencies. The denominator used for the calculation of a percentage is the number of households feeding supplements within the particular season.

Table 10.10 suggests that over half of the households (215 versus 184) did not vaccinate their animals. However, a few included vaccinations in the question that followed under 'treatments' for diseases; these are included in Table 10.11. These two sets of data for vaccination in the database will be reconciled for the final analysis. The question on vaccination was also phrased better in Phase 2 of the survey, and it will be possible, as for disease, to distinguish clearly between respondents that said that their household did not vaccinate and those that provided no answer to the question.

10.5.3 Treatment of disease

A similar analysis was undertaken for treatments (Table 10.11). As already mentioned, some vaccinations listed in this table are not included in Table 10.10. Treatment with antibiotics was by far the most common form of treatment given, followed by, excluding vaccinations, traditional methods. A large proportion of households, however, apparently did not treat their animals. Hot or cold compress treatment was reported in about a third of households applying treatments in the Matebeleland provinces. The purposes for using this treatment have not been investigated in this analysis.

Table 10.10. *Prevalent diseases reported by households and diseases vaccinated against.*

	Prevalent diseases (percentage of households) [a]					Vaccinations (percentage of households)[a]				
Disease	Mash. C.	Mash. E.	Mat. N.	Mat. S.	Mean/ total	Mash. C.	Mash. E.	Mat. N.	Mat. S.	Mean/ total
Quarter Evil (%)	*34* [b]	*42*	*89*	*95*	*65*	*10*	*26*	*54*	*62*	*38*
Lumpy Skin disease (%)	*19*	*14*	*29*	*29*	*23*	*5*	*10*	*13*	*9*	*9*
Babesiosis / Red Water (%)	*48*	*25*	*0*	*0*	*18*	*9*	*3*	*0*	*0*	*3*
Foot Rot (lameness) (%)	*19*	*10*	*5*	*9*	*11*	*1*	*0*	*0*	*0*	*<1*
Diarrhoea (%)	*10*	*21*	*5*	*3*	*10*	*3*	*0*	*0*	*0*	*1*
Eye problems (%)	*13*	*14*	*5*	*1*	*8*	*0*	*0*	*1*	*0*	*<1*
Anaplasmosis (%)	*1*	*10*	*13*	*6*	*7*	*0*	*0*	*1*	*0*	*<1*
Anthrax (%)	*6*	*5*	*9*	*7*	*7*	*9*	*40*	*20*	*8*	*19*
Foot and Mouth (%)	*1*	*7*	*5*	*7*	*5*	*6*	*12*	*9*	*8*	*9*
Heartwater (%)	*0*	*5*	*1*	*10*	*4*	*0*	*1*	*0*	*0*	*<1*
Three–day sickness (%)	*3*	*5*	*0*	*8*	*4*	*0*	*0*	*0*	*0*	*0*
Others (%)	*44*	*41*	*25*	*13*	*31*	*9*	*10*	*7*	*1*	*7*
Households reporting diseases/vaccinations (n)	100	75	83	80	338	25	49	59	51	184
Disease(s) named (n)	79	73	75	76	303	22	49	58	51	180
Disease(s) unknown (n)	21	2	8	4	35	3	0	1	0	4
Households not reporting diseases/vaccinations (n) [c]	20	19	13	11	63	95	45	37	40	215
Total no. of households (n)	120	94	96	91	401	120	94	96	91	401

[a] The denominators used for calculation of percentages, both for prevalent diseases and vaccinations, are the numbers of households naming prevalent diseases. These can be found in the first 5 columns alongside 'Disease(s) named (n)'. For examples, 27 households in Mashonaland Central reported Quarter Evil to be a prevalent disease – this represents 27/79 = 34% of households. At the same time 8 households reported that they vaccinated against Quarter Evil – this represents 8/79 = 10%.

[b] Percentages are given in italics to distinguish them more easily from frequencies.

[c] Percentages given here for vaccinations are underestimates as some were reported under treatments given (see Table 10.11).

Table 10.11. *A summary of treatments reported by farmers.*

Form of treatment	Mash. C.	Mash. E.	Mat. N.	Mat. S.	Mean/ total
Antibiotics (%)	*53* [a]	*61*	*48*	*79*	*60*
Vaccinations (%)	*16*	*40*	*35*	*8*	*24*
Traditional (%)	*17*	*21*	*25*	*15*	*19*
Hot/cold compress (%)	*0*	*0*	*35*	*30*	*15*
Anthelmintics (%)	*11*	*14*	*4*	*2*	*8*
Dipping (%)	*15*	*4*	*0*	*7*	*7*
Households reporting diseases	100	75	83	80	338
Households reporting that treatments are given (n)	75	57	52	61	245
Households reporting that treatments are not given (n)	10	11	26	17	64
Households not reporting any treatments given (n)	15	7	5	2	29

[a] Percentages are given in italics to distinguish them more easily from frequencies. These are expressed as the number of households where the particular form of treatment is given over the number of households reporting that treatments were given. Thus, antibiotics were used in 40 households in Mashonaland Central. This represents 53% (= 40/75) of households where treatments were applied.

10.6 Cattle numbers and productivity levels

10.6.1 Animal numbers

An important goal of a FAnGR survey is to estimate livestock numbers within a given area. This is not an easy task as the following analysis shows. Cattle numbers were collected on Page 1c of the survey questionnaire alongside numbers for other species and also on Page 8c under herd structure (see Appendix 1). The former were provided for all households and the latter only for cattle as a primary or secondary species. An important first step in the data analysis is to see how closely the pairs of entries tally. The ratio of the standard deviation of the two entries (s.d.) to their means was calculated to determine the similarity of the two numbers of cattle provided. It was decided to highlight as 'different' those entries with both a ratio >0.4 and a difference in the two numbers more than 2. Examples of entries showing such 'differences' are shown for five households below.

Cattle numbers Page 1c (column 1)	Cattle numbers Page 8c (column 2)	Ratio of s.d. over mean of two columns	Difference between numbers in columns 1 and 2
20	6	0.76	14
35	16	0.53	19
11	6	0.42	5
9	18	0.47	-9
48	98	0.48	-50

Of the 1,000 households in which cattle were recorded as a primary or secondary species, information on herd structure was not recorded in 1,000 – 984 = 16 of them

(Table 10.12). Of the remaining 984 households discrepancies between pairs of entries were apparent, according to the above rule, in 69 of them. A majority of these (55) were cases where the numbers under herd structure on Page 8c were less than those entered on Page 1c. The tendency for respondents to have underestimated, at the start of the interview, the numbers of cattle owned would appear, therefore, not to be of major concern. Most of the under-recording appears to be in completing herd structure information. It may be that only some of the animals were seen by the enumerator or, in the cases of households with mixed breeds, only pure breeds were recorded. The reason needs to be investigated further – the majority of these 55 cases were in Matebeleland North. A scatter plot of the data with the 69 households removed and with herd size ≤ 100 is shown in Fig. 10.2. The correlation coefficient is 0.99.

Since only 14 of the 1,000 (1.4%) respondents appear to have provided significant underestimates of cattle numbers (Table 10.12), it seems reasonable to ignore the influence of such errors in the estimation of population numbers. Thus, all households, whether or not providing data on cattle as a primary or secondary species, were included.

Table 10.13 provides details on herd size by wealth group for Matebeleland North and Matebeleland South. 'Rich' households possessed an average of 29.5, 'medium wealth' households 10.8 and 'poor' households 4.2 heads of cattle when averaged over the two provinces. Wealth categories for the two Mashonaland provinces had not been entered in the database in time for this analysis. Table 10.13 also shows that the standard deviations are approximately equal to the mean values for the 'rich' and 'poor' households indicating a skewness in the distributions of numbers of cattle held by these households. Nevertheless, the standard deviations within the 'medium' and 'poor' wealth groups are much smaller than the standard deviations derived ignoring wealth group (see mean/total line in Table 10.13) showing the benefit of stratification. Histograms of the overall distributions of cattle numbers for the four provinces in cattle numbers are shown in Fig. 10.3. Distributions were similar across provinces except that none of the households sampled in Mashonaland Central had more than 50 head of cattle.

Table 10.12. *Numbers of households providing data suitable for calculation of cattle* p*opulation estimates, herd structures and fertility levels.*

Number of households with data on livestock kept [a]	1348
Number of these with cattle as primary or secondary species	1000
Number of these with data on herd structures	984
Number of these with 'valid' cattle numbers	915
Discrepancies [b] (i) no. page 1c < no. page 8c	14
(ii) no. page 1c > no. page 8c	55
Number with 'valid' cattle numbers with cattle as main species	369
Number of these with data on births	205
Number of these used for calculation of 'fertility index' [c]	198

[a] Two households had no information on livestock kept.

[b] Discrepancy if $\sqrt{[(n_1 - n_2)^2/2]} / (n_1 + n_2)/2 > 0.4$, and $|n_1 + n_2| > 2$, where n_1 = number recorded on Page 1c and n_2 = number recorded on Page 8c of questionnaire (see Appendix 1).

[c] Seven households with unlikely data values omitted.

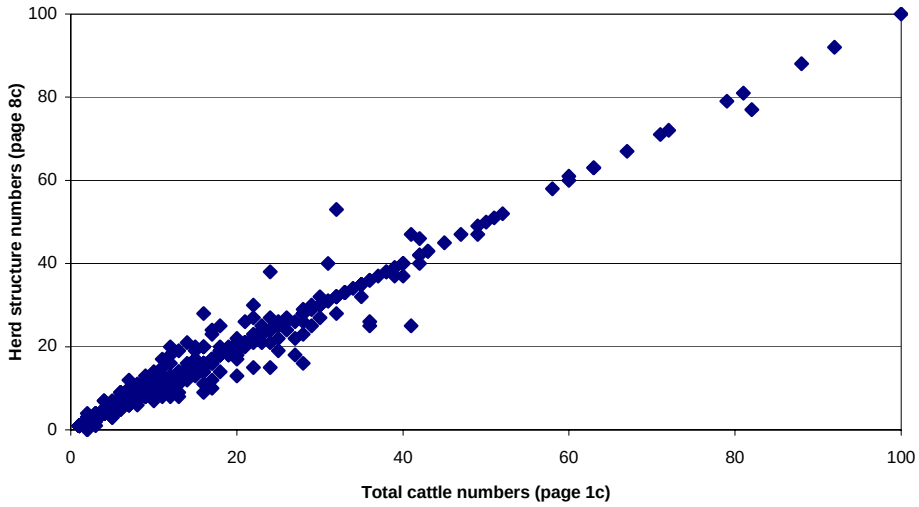


Fig 10.2. *Scatter plot of numbers of cattle provided on Page 1c of questionnaire plotted against numbers given on Page 8c (see Appendix1) excluding for readability those herds with more than 100 head of cattle, and also 69 herds with discrepancies in values as defined in Table 10.12.*

Table 10.13. *Mean numbers (± standard deviation) of cattle owned by households by wealth category in Matebeleland North and Matebeleland South.*

	Mat. N.		Mat. S.	
Wealth category	No. households	Mean ± s.d.	No. households	Mean ± s.d.
'Rich'	75	28.6 ± 21.1	110	30.3 ± 30.6
'Medium'	140	12.3 ± 7.6	95	9.2 ± 5.8
'Poor'	155	5.1 ± 5.1	129	3.2 ± 6.8
Total/mean	371	12.5 ±14.1	334	13.8 ± 21.7

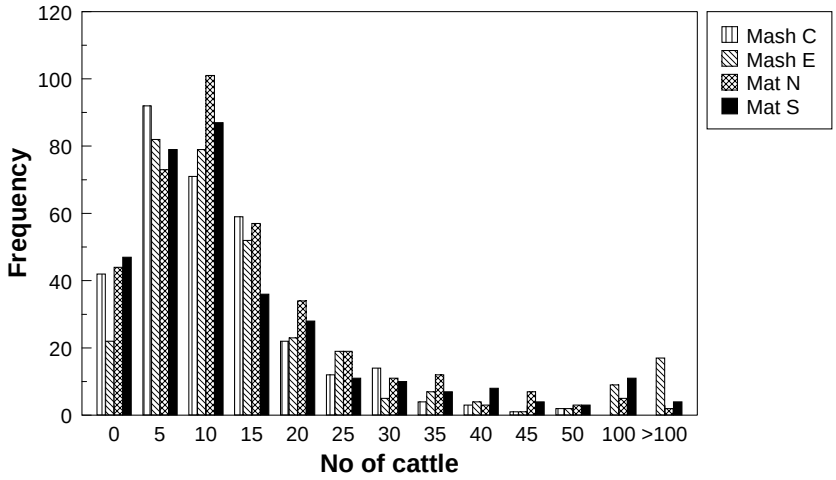


Fig.10.3. *Distribution of numbers of cattle per household in the four provinces.*

In order to estimate population cattle numbers information is also needed on the total number of households with livestock in the villages that were sampled, and preferably also from those villages not sampled (see section 2.4 of Chapter 2). At the time of the analysis not all these data were available. Thus, the method is illustrated with data from just two wards from which numbers of households were known in the villages sampled but not in those not sampled.

The formulae for estimating the population total in a ward together with its variance are given in the appendix to this chapter (see section 10.10). The formulae look complicated but essentially involve calculating means and variances at each layer – household/village and village/ward – weighting them according to the number of households sampled relative to the numbers in the respective populations, and then merging them together.

Table 10.14 provides the data required for this calculation for one ward in Matebeleland South and one ward in Matebeleland North, and also shows the population estimates derived and their standard errors. It can be seen from this table that the estimated number of cattle in ward A is more precisely estimated than that in ward B for which the estimate is imprecise. The data for ward B need to be checked to verify that numbers have been entered correctly into the computer and the correct wealth group recorded.

A major contributing factor to the large standard error for the population total in ward B is the relatively large range in cattle numbers in the medium household group. The households that were sampled in the medium category represent a small percentage (4.4% = 13/297 – see Table 10.14) of the numbers of households in this category in the two villages. Table 10.14 thus illustrates a slight limitation in the methodology used in the choice of the households to be sampled. Rather than attempt to select equal numbers of households from each wealth group it would in hindsight have been preferable to have selected more households in the medium wealth group than in the other two groups. Also more care may be needed in defining wealth groups to ensure that the spread in numbers of livestock within a group is not so wide, and that group sizes are more similar.

This methodology can be extended upwards to the district level and ultimately to that of province but care is needed in ensuring that methods of stratification, e.g. ecological zone, that have been applied, are taken properly into account. The extent to which wards were selected at random within a district also needs to be borne in mind.

10.6.2 Productivity

It is not a primary aim of the FAnGR survey to collect data on livestock productivity. Nevertheless, a few results can be derived. Thus, for cattle, details of number of cows in the herd and numbers of calves born provide some indication of level of reproduction. Approximate estimates of ‘calving rate’ for the four provinces in Zimbabwe are given in Table 10.15. To obtain these values only those households that recorded cattle as a main species and for which there was a reasonable match between cattle numbers recorded on Page 1c and Page 8c of the questionnaire were used (see Table 10.12). This number was further reduced to include only those households that recorded the number of births over the previous year (Table 10.12). Seven households had somewhat extreme and unlikely calf/cow ratios and these were also ignored leaving 198 households for analysis.

The results in Table 10.15 show that approximately half the cows gave birth each year and that the pattern was similar across provinces.

Table 10.14. *Calculation of estimates of population sizes (± s.e.) of cattle in two wards in Matebeleland provinces. Formulae are given in section 2.5 of Chapter 2, and in the appendix to this chapter section 10.10).*

	Ward											
	A (containing 7 villages)						B (containing 5 villages)					
	Village 1 in sample			Village 2 in sample			Village 1 in sample			Village 2 in sample		
Wealth group	Rich	Medium	Poor	Rich	Medium	Poor	Rich	Medium	Poor	Rich	Medium	Poor
Mean no. of cattle [a]	19.0	6.8	5.1	18.0	8.0	4.2	52.4	16.4	9.8	25.7	11.6	4.0
Range	8-27	3-12	0-8	12-26	4-14	0-9	15-125	0-36	2-16	12-59	0-23	0-7
Standard error of mean (s^2/n)	6.5	1.5	1.2	3.3	1.0	1.7	11.0	6.3	2.0	6.9	3.0	1.1
n [b]	5	5	7	4	1.0	5	5	5	6	7	8	6
N [c]	7	99	19	11	79	19	12	150	35	13	147	31
Estimated number of cattle in village (± s.e)	904 ± 151			910 ± 82			3,433 ± 954			2,167 ± 432		
Number of households in village	125			109			197			191		
Estimated average number of cattle per household in ward	7.75						14.43					
Estimated number of cattle in ward (± s.e.)	6,349 ± 501						14,000 ± 2821					

[a] Mean number of cattle in the sampled households.
[b] No. of households sampled.
[c] No. of households in village.

Table 10.15. *Estimates of 'calving rate'.*

Province	No. households [a]	No. births	No. cows	Births/cow x 100
Mash. C.	46	129	251	51
Mash. E.	47	282	559	50
Mat. N.	60	207	370	56
Mat. S.	45	203	465	44
Total/mean	198	821	1645	50

[a] Seven households were omitted for which ratios of births to cows seemed most unlikely (see Table 10.12).

10.7 Genetic diversity

10.7.1 Breeds

So far we have considered all cattle together regardless of breed. Now, by taking the data collected in Question 1 in Pages 8c and 9c of the questionnaire, we shall study the distributions of the different breeds. Table 10.16 shows the distribution of pure breeds across the four provinces. The Mashona breed is shown to be very common in Mashonaland Central whilst Nkone cattle were reported mostly in Matebeleland North. Pure Afrikaner cattle were also reported most frequently in Matebeleland North and pure Brahman in Mashonaland East. The relative frequencies of each breed in each province, as proportions of the numbers of households with named pure breeds in the province, are illustrated in Fig. 10.4. The questionnaires that were completed for pure breeds, but without a breed code given (see Table 10.16), need to be studied further.

Table 10.16. *Numbers of households with cattle of different pure breeds [a] and crossbreeds by province.*

	Mash. C.	Mash. E.	Mat. N.	Mat. S.	Total
Mashona	251	30	10	8	299
Nkone	2	0	47	4	53
Afrikaner	5	4	27	4	40
Brahman	4	20	4	6	34
Tuli	1	1	15	5	22
Tonga	0	0	5	0	5
Hereford	0	0	1	0	1
Sussex	0	1	0	1	1
Friesland	0	0	1	0	1
Unknown	0	0	1	0	1
Not described	8	29	18	10	65
Total (pure breeds)	271	85	129	38	522
Crossbreeds [b]	70	271	189	179	709

[a] Many of these households kept both pure breeds and crossbreeds.

[b] These numbers may be slight underestimates since it is possible that for a few households, as discussed earlier in relation to Table 10.12, Page 8c may have been completed for one pure breed only when there may also have been other cattle owned by the household.

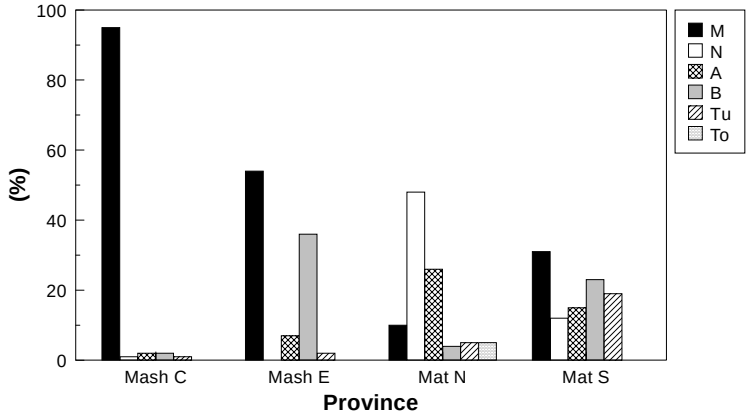


Fig 10.4. *Frequencies of households with Mashona (M), Nkone (N) Afrikaner (A), Brahman (B), Tuli (Tu) and Tonga (To) in each province as a percentage of all pure breeds owned by households in the province.*

Mixed crossbreeds represented by far the most common types of cattle in all provinces except Mashonaland Central (Table 10.16). Mashona and Brahman breeds together with Afrikaner were the predominant breeds observed among the crosses in Mashonaland East and a similar pattern was observed in Mashonaland Central (Table 10.17). A variety of breeds (including Nkone, Mashona, Afrikaner, Brahman and Tuli) all contributed to crossbreeding in the two Matebeleland provinces, with the incidence of crossbreeding greater in Matebeleland South than Matebeleland North (Table 10.16). Crosses with Herefords were reported in Matebeleland North (Table 10.17).

Table 10.17. *Percentages of times breeds reported in crossbreeding* [a].

	Province			
Breeds	Mash. C.	Mash. E.	Mat. N.	Mat. S.
No. of households	70	271	189	179
Mashona (%)	*47*	*38*	*18*	*11*
Nkone (%)	*3*	*2*	*23*	*16*
Afrikaner (%)	*14*	*22*	*21*	*20*
Brahman (%)	*30*	*25*	*17*	*29*
Tuli (%)	*0*	*1*	*15*	*19*
Tonga (%)	*0*	*0*	*3*	*0*
Hereford (%)	*1*	*5*	*16*	*1*
Sussex (%)	*2*	*4*	*<1*	*2*
Friesland (%)	*1*	*1*	*2*	*1*
Jersey (%)	*0*	*2*	*1*	*1*

[a] Numbers in italics in the table represent the percentages of times different breeds are mentioned as contributing to the crosses kept in a household.

Table 10.18 illustrates the numbers of households that possessed one pure breed only, two pure breeds only, crossbreeds only and crossbreeds and pure breeds together. No household had three pure breeds alone, i.e. without crossbreeds. As can be seen from Table 10.18 several households were reported with both pure and crossbred cattle. Thus, there may be overlaps of crossbreeds within identified pockets of pure breeds.

Table 10.18. *Numbers of households with pure breeds and crossbreeds.*

Breed types	Province			
	Mash. C.	Mash. E.	Mat. N.	Mat. S.
Pure breeds only [a]	195	15	62	11
1 breed	193	14	55	11
2 breeds	2	1	7	0
Crossbreeds only	9	236	151	162
Crossbreeds + pure breeds	61	35	38	17

[a] Some of these households are likely to have also had crossbreeds. It is apparent from the questionnaires that such data were not always collected.

Since the largest number of different pure breeds was reported in Matebeleland North, the data in Tables 10.16 and 10.17 were subdivided further by ward to investigate variations in crossbreeding patterns across the province (Table 10.19). To illustrate some of this variation the proportions of different breeds featuring in the crossbreeding in Wards 1, 2, 3 and 7 of Table 10.19 are shown in the form of a pie-chart (Fig. 10.5). Further analysis of these data will require a geographical interpretation of the distribution of these wards across the province together with their proximity to commercial farms.

Table 10.19. *The percentage of times that different breeds were reported as contributing to crossbreeds in Matebeleland North.*

Ward	Mashona		Nkone		Afrikaner		Brahman		Tuli		Tonga	
	%[a]	n [b]	%	n	%	n	%	n	%	n	%	n
1	26	0	28	3	19	1	0	0	14	0	14	4
2	13	0	30	6	7	1	11	2	33	3	8	1
3	3	0	21	4	24	1	34	0	8	2	0	0
4	20	2	36	11	24	1	0	1	12	1	0	0
5	21	5	21	6	24	6	10	0	7	4	0	0
6	12	0	16	1	30	3	33	0	5	0	0	0
7	6	2	2	3	22	6	33	1	12	1	0	0
8	2	1	18	6	9	3	27	0	18	4	0	0
9	10	0	34	7	31	5	2	0	18	0	2	0
Mean/ total	13	10	21	47	21	27	17	4	14	15	3	5

[a] The first column (%) expresses the frequency that a breed is mentioned as a percentage of the total number of times that different breeds are mentioned as forming parts of crosses.
[b] The second column (n) gives the number of households reporting the keeping of purebred animals.

10.7.2 Breed numbers

In view of the scattered and, in some cases, few, occurrences of households with pure breeds, it is difficult, except for Mashona cattle, to obtain reliable estimates of population numbers by breed. Probably the best that can be done is to count the number of cattle recorded for a particular breed in a ward, express this as a percentage of the total cattle sampled in the ward and multiply this figure by the total estimated population size (Table 10.14). The results are illustrated in Table 10.20 for the two wards, Ward A and B, used in the calculation of population estimates in Table 10.14. The table gives the numbers of cattle recorded for the five pure breeds, each expressed

as a percentage of all the cattle, both pure and crossbred, recorded on Pages 8c and 9c of the questionnaire (see Appendix 1). Pure Brahman cattle were reported in seven households in ward A; otherwise the numbers of households with each breed were scarce (Table 10.20). By multiplying the percentage values shown in Table 10.20 by the population totals in Table 10.14 approximate population sizes can be calculated. These are shown in Table 10.20 rounded to the nearest 100. Whilst approximate, these nevertheless give some idea of the numbers of pure-bred cattle currently being kept relative to the total cattle population estimated in Table 10.14. As already mentioned, many of these pure breeds were reported in some households alongside crossbreds. One might expect, therefore, the total numbers of pure breeds to be reducing. This analysis, together with a summary of the information reported on breed trend (see Question 2 on Page 8c of questionnaire), but not yet analysed, could be useful in identifying those breeds at particular risk.

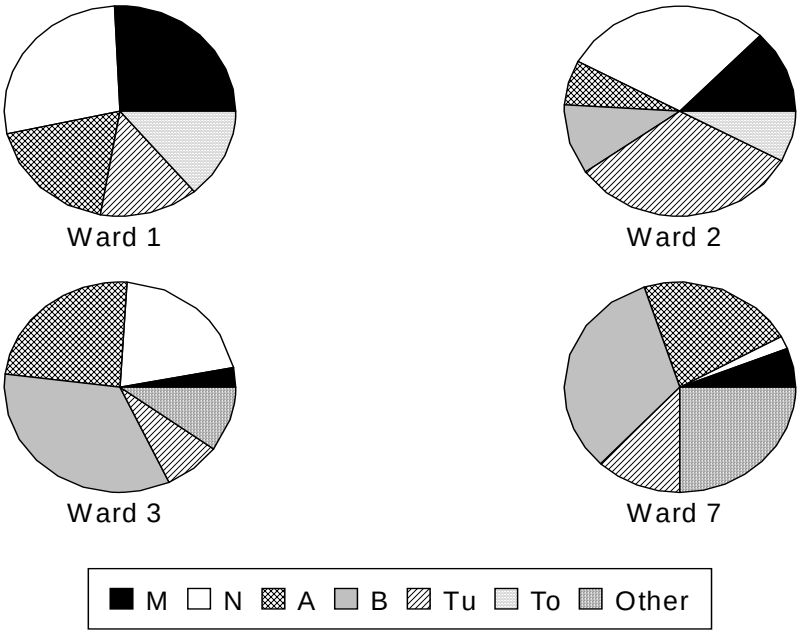


Fig.10.5 *Pie-chart comparing the frequencies with which Mashona (M), Nkone(N), Afrikaner (A), Brahman (B), Tuli (Tu) and Tonga (To) breeds were used for crossbreeding in different wards in Matebeleland North.*

Table 10.20. *Estimation of approximate total numbers of pure breeds in two wards in the two Matebeleland provinces.*

		Breed					
	Ward	Mashona	Nkone	Afrikaner	Brahman	Tuli	Total
Percentage of cattle recorded as pure breeds	A	*6*(3)[a]	*2*(1)	*3*(2)	*18*(7)	*3*(1)	*32*
	B	*7*(1)	*2*(3)	*4*(1)	*0*	*0*	*13*
Estimated total number in the ward [b]	A	400	100	200	1,100	200	2,000
	B	1,000	300	600	0	0	1,900

[a] Number of households keeping pure breeds in parentheses. Percentages in italics.
[b] Calculated as percentage recorded as pure breed x estimated total number of cattle in ward (see Table 10.14).

10.7.3 Herd structures

Table 10.21 summarises herd structures both by province, averaged over all breeds and crosses, and by breed (see Question 3, Pages 8c and 9c for pure breeds). The proportions of adult female cattle in a herd ranged from 39% in Mashonaland Central to 51% in Matebeleland South. There were higher percentages of castrated adult male cattle in Mashonaland Central than in the other three provinces. The results given in Table 10.4 on purposes of keeping cattle could be further investigated to determine the reasons for this. Mashonaland East appeared to retain a greater proportion of replacement heifers than the other provinces.

Table 10.21. *Herd structures by province and by breed.*

			Percentage of animals					
			< 3 years			≥3 years		
	No. of households	No. of animals	Male	Castrated	Female	Male	Castrated	Female
Province								
Mash. C.	263	2,751	9.6	3.9	16.2	3.8	27.4	39.0
Mash. E	286	6,218	9.1	9.6	22.9	3.2	13.4	41.8
Mat. N.	254	3,143	10.6	7.4	15.3	5.2	16.1	45.3
Mat. S.	184	2,658	8.7	6.3	15.6	2.5	15.3	51.4
Breed								
Mashona	293	2,688	8.6	4.2	16.6	3.5	26.3	40.7
Nkone	40	251	9.6	2.4	12.7	4.8	23.5	47.0
Afrikaner	34	246	6.5	7.7	17.1	18.3	14.6	35.8
Brahman	52	483	10.6	7.5	13.0	5.8	21.3	41.8
Tuli	19	96	10.4	4.2	20.8	6.2	12.5	55.8

The herd structure for the Mashona breed (Table 10.21) followed closely that of Mashonaland Central where this was the predominant breed. Numbers of animals were generally too few to make comparisons across breeds, except to observe that significantly higher proportions of non-castrated bulls were apparently kept for Afrikaner than other breeds, possibly indicating greater use of this breed for breeding.

10.7.4 Tribe

Does breed ownership vary across tribe? The answer to this question is illustrated in Table 10.22 for households in Matebeleland North. This is the province with the greatest variety of pure breeds (Table 10.16). The Ndebele people were the only tribe to keep Mashona cattle. Otherwise, when expressed as a proportion of the numbers of households, it can be seen from Table 10.22 that ownership of the different breeds was distributed evenly across tribes. The exception was the Tonga breed of cattle kept by the Tonga tribe.

10.7.5 Breed phenotypic characteristics

Having obtained information on the numbers of pure breeds kept by households and their distribution across provinces, we can now examine information provided on Page 10c of the questionnaire (see Appendix 1) on what the breeds look like. This, of course, is a key goal of the FAnGR survey. The results for two of the breeds, Mashona and Tuli, are shown in Tables 10.23 –10.27.

Table 10.22. *Distribution of numbers of households with pure breeds by tribe in Matebeleland North.*

	Tribe			
Breed	Ndebele	Tonga	Others [a]	Not described
Mashona	10	0	0	0
Nkone	28	7	7	5
Afrikaner	20	1	3	3
Brahman	1	0	1	2
Tuli	11	1	1	2
Tonga	0	5	0	0
Total	60	14	12	12

[a] Kalanga, Karanga, Ndau and Shangani tribes.

The sample size for households for which phenotypic details were recorded for Mashona is large, namely 263. Thus, the phenotypic characterisation can be described very precisely (Table 10.23). The table shows each phenotypic characteristic, as it was described in the survey, together with the frequency, expressed as a percentage, with which it is recorded. This provides a suitable method for describing the variation observed in each attribute. Where a percentage is greater than 20% the description is shaded (Table 10.23). A number of percentage values < 2% occurred. It will be worth checking the questionnaires providing such information to see whether other phenotypic traits recorded in the questionnaire fit the general description for the breed in question. It may be that the enumerator had mistaken the breed or there may be a mistake in recording. For example, the vast majority of the Mashona cattle were recorded as having small ears (99%), whereas in 1% of animals they are recorded as large

Table 10.24 provides the same information for Tuli cattle. Here the sample size is only 13 so the phenotypic characterisation is not precisely determined. Nevertheless, the information has been presented in the same way and appears to provide a good description of this breed too. The summary given in Table 10.24 differs in certain respects from the breed fact sheet prepared by Matopos Research Station and used in the training of enumerators (Appendix 3). For example, survey observations describing the horns of Tuli cattle differed from those recorded in the breed fact sheet. Table 24 shows that horns were predominately reported as being absent, but, when present, they were mostly curved (not straight), pointing forward (rather than upright) and of medium length (rather than long). The animal's back was also reported to be mainly straight, and in only one household as hollow. Characteristics of the hump were mistakenly omitted from the questionnaire used for Phase 1 of the survey. Hump details are, therefore, missing from Tables 10.23 and 10.24. Data contained in the breed fact sheet were based on a selected group of cattle. This survey demonstrates the value of studying a wider cross section of populations of animals in the field. Although verification of the enumerators' recordings will be required, the data provide, nevertheless, a broader picture of the phenotypic characteristics of animals in their natural settings.

Table 10.23. *Phenotypic descriptions of the Mashona breed (percentages based on a sample size of 263 households).*

Coat	Pattern	Uniform	92	[a]	Pied	<1	Spotty	8
	Hair length	Short	97		Medium	3		
	Hair type	Straight	100					
Body	Frame size	Small	31		Medium	66	Large	3
Dewlap		Absent	11		Present	89		
	Size	Small	90		Medium	10		
Naval flap		Absent	31		Present	69		
	Size	Small	98		Medium	2		
Profile	Face	Flat	68		Concave	22	Convex	10
	Back	Hollow	38		Straight	62		
	Rump	Flat	19		Sloping	74	Roofy	7
Horns		Absent	9		Present	91		
	Shape	Straight	20		Curved	73	Lyre-shaped	7
	Orientation	Forward	14		Lateral	59	Upright	27
	Spacing	Narrow	88		Wide	12		
	Length	Short	27		Medium	61	Long	12
Ears	Size	Small	99		Large	1		
	Edge	Round	81		Straight	19		
	Orientation	Erect	23		Lateral	77		
Tail	Length	Short	10		Medium	44	Long	45
	Thickness at base	Narrow	24		Medium	71	Wide	5
Udder	Size	Small	57		Medium	41	Large	2
	Teats	Rudimentary	12		Medium	86	Large	2

[a] Attributes reported in more than 20% of households are shaded.

Table 10.24. *Phenotypic descriptions of the Tuli breed (percentages based on a sample size of 13 households).*

Coat	Pattern	Uniform	100	[a]			
	Hair length	Short	100				
	Hair type	Straight	100				
Body	Frame size	Medium	100				
Dewlap		Present	100				
		Small	31	Medium	69		
Naval flap	Size	Absent	8	Present	92		
		Small	67	Medium	33		
Profile	Face	Flat	62	Concave	15	Convex	23
	Back	Hollow	8	Straight	92		
	Rump	Flat	23	Sloping	77		
Horns		Absent	62	Present	38		
	Shape	Curved	80	Lyre-shaped	20		
	Orientation	Forward	80	Upright	20		
	Spacing	Narrow	40	Wide	60		
	Length	Medium	100				
Ears	Size	Small	54	Large	46		
	Edge	Round	54	Straight	46		
	Orientation	Lateral	100				
Tail	Length	Short	38	Medium	62		
	Thickness at base	Narrow	23	Medium	62	Wide	15
Udder	Size	Small	46	Medium	46	Large	8
	Teats	Rudimentary	15	Medium	69	Large	15

[a] Attributes reported in more than 20% of households are shaded.

Table 10.25. *Percentages of different body colour combinations found in Mashona cattle in a sample of 263 households.*

Primary colour	Frequency category [a]	Secondary colour: None	White (02) [b]	Brown (10)	Black (36)	Total
Black (01)	1	59	21	2		82 [c]
	2	8	19	2		29
	3	4	8	<1		12
	4	<1	3	<1		3
	5	0	1	0		1
	Total (n)	71	60	4		
Orange (36)	1	3	0		1	4
	2	11	1		2	14
	3	6	1		3	10
	4	1	2		4	7
	5	1	0		0	1
	Total (n)	21	4		10	
Orange – brown (13)	1	3	1			4
	2	8	5			13
	3	5	2			7
	4	2	0			2
	5	1	2			3
	Total (n)	19	10			
Brown (10)	1	1	0		<1	1
	2	3	1		2	6
	3	3	<1		2	5
	4	2	0		0	2
	5	1	<1		<1	1
	Total (n)	10	1		4	
Light orange (35)	1	1	<1			1
	2	3	1			4
	3	2	2			4
	4	1	0			1
	5	0	0			0
	Total (n)	7	3			

[a] Ranked according to frequency of colour combination in households: 46 households reported just 1, 74 households 2, 76 households 3, 37 households 4 and 30 households 5 colour combinations.
[b] Code from colour chart (see Appendix 2).
[c] Percentage of the sample of households reporting a given colour combination. A few households reported other colour combinations than those reported here. Hence, percentages do not add up to 100.

The body colour combinations observed for the Mashona breed are given in Table 10.25. The footnote to this table demonstrates the range of colours observed in individual households. By far the most commonly reported colour was black but a large number of animals also had some white on their body. The remaining animals were of

different primary shades of orange and brown. The table shows that these were rarely the most common colours in a herd, but were often the second or third most common.

There were a few records of animals described as uniformly white or predominantly white with another colour. These do not appear to be characteristic of this breed; they have not been included in the table and need to be checked.

With the variety of colours reported for the Mashona breed it is of interest to study these colours at the ward level to see whether there are variations that might reflect strain differences across a province. These are shown in Table 10.26 for Mashonaland Central. Black and black/white animals were prominent in each ward. It is noteworthy that the different colour contributions of browns and oranges also occur throughout the wards. It would appear, therefore, that each enumerator was able to distinguish between the different shades of orange and brown. Further analysis of these data would need to utilise geographical representations of the position of each ward in the district, assuming that it was deemed necessary to do so.

Table 10.26. *Percentages of households with a colour combination recorded for Mashona cattle in each of nine wards in Mashonaland Central Province.*[a]

	Black (01)[b]	Black/white (0102)	Orange (36 & 3602)[c]	Orange-brown (13 & 1302)	Brown (10 & 1002)	Light orange (35 & 3502)
Ward						
1	11	33	2	18	13	4
2	22	14	6	8	7	2
3	28	17	19	13	6	4
4	24	18	10	5	3	16
5	20	16	16	8	4	2
6	25	20	21	13	4	4
7	25	16	16	6	0	0
8	38	20	8	16	1	4
9	21	21	14	11	2	2

[a] Summed over frequency category (see Table 10.25)
[b] Code from colour chart (see Appendix 2).
[c] Both uniform colour and primary colour with white combined.

The body colours seen for Tuli cattle are shown in Table 10.27. It can be seen that colours were more consistent within each household compared with the Mashona breed. The most frequently reported colour was yellow-orange (half the population), followed by cream and fawn. There were also two reports of red-brown coats. The breed field guide (Appendix 3) suggests possible colours of white, brownish-grey, beige, yellow, red or tan.

Similar analyses can be undertaken for the colours of the other parts of the body for these two breeds. Given a sufficient sample size these phenotypic data may also lend themselves to other multivariate techniques such as cluster analysis to investigate possible strain types within breeds. Such methods are being applied to analyse phenotypic data collected in Ethiopia.

Table 10.27. *Percentages of different body colour combinations found in Tuli cattle in a sample of 13 households.*[a]

	Secondary colour		
Primary colour	None	White (02)[b]	Total
Yellow-orange (34,35,36)[b]	44	6	50
Cream (03)	22	0	22
Fawn (05)	11	6	17
Red-brown (14)	5.5	5.5	11
Total	82.5	17.5	100

[a] One primary colour only for animals reported in 10 households, two primary colours for animals in 4 households.
[b] Code from colour chart (see Appendix 2).

10.7.6 Perceived quality of traits

Finally, how do farmers perceive the quality of their cattle? Before answering this question reasons for choice of bulls (Question 2 on Page 7c) and reasons for culling of male and female cattle (Question 5 on Page 6c of questionnaire) are described. The results reported in Tables 28 and 29 are again in the form of an index that combines the ranks given by the respondents. Because information available for certain breeds kept alone in a household was scanty, in view of there being only the handfuls of households where this breed was the primary species, it was decided to calculate these indices based on all the households where the particular breed was found. This could provide a slightly biased analysis since this uses the farmer's combined assessment for all the cattle he has, but on the other hand increases the sample size.

Body size is clearly the most important trait considered in the choice of a bull, followed by colour and temperament (Table 10.28). Size and temperament featured particularly highly for households where Afrikaner bulls were kept. Colour assumed greater importance for Tuli and Brahman than other breeds.

Age was the most important reason for culling male and female cattle, followed by poor fertility for females (Table 10.29). Size was also important, especially for male Nkone, Tuli and Brahman cattle. Other traits, such as performance, health and temperament, appeared to be of lesser importance.

Table 10.28. *Reasons for choice of bulls.*

	No households [a]		Indices for traits [b]				
	One breed or more	One breed only [c]	Size	Colour	Temper-ment	Availab-ility	Horns
Mashona	131	90	.48 [a]	.15	.21	.06	.05
Nkone	28	12	.45	.16	.23	.06	.06
Afrikaner	15	7	.57	.04	.28	.10	.00
Brahman	9	1	.50	.22	.16	.00	.06
Tuli	13	1	.51	.26	.10	.10	.03
Crossbreeds	198	198	.50	.18	.14	.09	.03

[a] Households providing information on choice of bull.
[b] Indices based on all households in which breed present ('One breed or more'). See footnote of Table 10.4 for calculation of indices.
[c] Number of households with cattle as primary species and with all cattle in the herd belonging to the one breed described. Households with one breed reported but with discrepancies in numbers of cattle given on Page 1c and Page 8c of questionnaire (see Table 10.10) not included in this column.

Table 10.29. *Reasons for culling.*

		No. households [a]		Indices for traits [b]							
Sex	Breed	One breed or more	One breed only [c]	Age	Size	Fertility	Performance	Health	Body condition	Temperament	Colour
Male	Mashona	136	93	.30 [a]	.15	.04	.15	.13	.07	.14	.01
	Nkone	30	13	.32	.29	.07	.07	.09	.06	.09	.00
	Afrikaner	18	7	.36	.14	.09	.13	.05	.13	.07	.02
	Brahman	9	1	.26	.27	.05	.07	.16	.06	.12	.00
	Tuli	14	1	.34	.25	.05	.18	.03	.07	.06	.01
	Crossbreeds	221	117	.32	.20	.04	.11	.10	.10	.09	.01
Female	Mashona	135	92	.28	.13	.19	.09	.11	.05	.12	.01
	Nkone	30	13	.33	.21	.26	.07	.06	.04	.03	.00
	Afrikaner	18	7	.35	.10	.22	.10	.05	.10	.05	.01
	Brahman	8	1	.29	.15	.24	.09	.09	.06	.08	.00
	Tuli	14	1	.37	.17	.27	.10	.04	.03	.02	.01
	Crossbreeds	216	45	.31	.14	.25	.08	.07	.07	.06	.01

[a] Households providing information on culling.
[d] Indices based on all households in which breed present ('One breed or more'). See footnote of Table 10.4 for calculation of indices.
[c] See footnote to Table 10.28.

Table 10.30 illustrates the perception by farmers of the importance of different traits. This table is based on reports of cattle both as a primary and secondary species derived from Question 5 for pure breeds and Question 3 for mixed crosses on Pages 8c/9c of the questionnaire (see Appendix 1). The table is arranged in order by the average importance attached to each trait calculated as the proportion of households providing an answer other than 'not important/no opinion' to the question on traits. The five traits perceived to be of most importance (by 94% or more of farmers when averaged over breed) were size, adaptability to environment, growth, temperament and fertility. Adaptability to environment scored highly for all breeds on the basis of the percentage of good ratings (Table 10.30). There was greater variability in perceptions among breeds for some of the other traits as illustrated in Fig. 10.6 which plots the deviations of the individual percentages shown in Table 10.30 from the average. Thus, Mashona cattle rated lower than other breeds for size, growth and milk yield. The Nkone cattle generally rated well for each trait. In general, Tuli ranked closely with Nkone. Horns were often ranked average or poor, with Afrikaner and Brahman the poorest. These two breeds also had the lowest rating for temperament. To illustrate the significance of the degrees of variation among breeds, temperament, fertility and milk performance traits were each compared by a χ^2 test applied to 5 x 2 tables by breed and 'good'/'not good'. There were significant differences among breeds in terms of perception of their temperament ($P<0.001$), their milk performance ($P<0.01$), but not fertility. These differences are reflected in Fig. 10.6

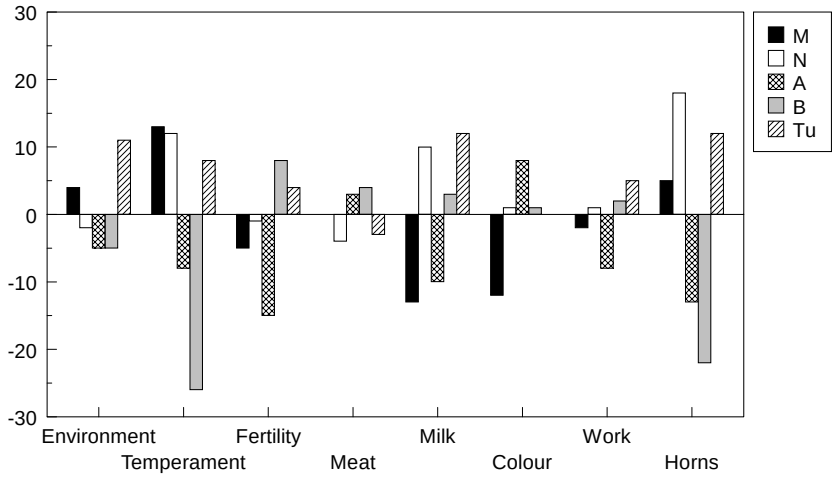


Fig 10.6. *Graphical representation of differences among breeds (M: Mashona, N: Nkone, A: Afrikaner, B: Brahman, T: Tuli) in percentages of perceptions of good ratings for a number of traits, expressed as percentage deviations on the y-axis from the average percentage rating for all breeds for a particular trait.*

Table 10.30. *Quality of traits perceived by farmers: first, the percentages of farmers considering a trait to be an important characteristic of the breed and, second, of those considering the trait important, the percentages of farmers considering the trait to be a good characteristic of the breed.*

			Trait									
		No. households	Size (%)	Environ-ment (%)	Growth (%)	Tempera-ment (%)	Fertility (%)	Meat (%)	Milk (%)	Colour (%)	Work (%)	Horns (%)
Important characteristic [a]	Mashona	295	99	99	98	97	95	89	95	94	95	87
	Nkone	53	100	100	96	100	96	94	98	85	98	78
	Afrikaner	40	95	97	97	94	89	92	89	85	87	69
	Brahman	34	97	97	100	94	100	91	69	94	69	53
	Tuli	18	100	89	89	89	89	71	78	82	72	53
Good characteristic [b]	Mashona	257-292 [c]	61	93	53	80	65	86	39	74	85	56
	Nkone	39 – 53	81	87	69	79	69	82	62	87	88	69
	Afrikaner	24 – 38	82	82	76	59	55	89	42	94	79	38
	Brahman	17 – 33	88	82	91	41	78	90	55	87	89	29
	Tuli	8 – 18	67	100	63	75	81	83	64	86	92	63

[a] If 'poor', 'average' or 'good' ticked then trait assumed important. Values in this part of the table represent percentages of households that considered trait an important characteristic.
[b] Numbers in this part of table represent number of households reporting trait as 'good' as a percentage of ('poor' + 'average' + 'good').
[c] Range in numbers of households considering a trait important and used as the denominator for calculation of percentages; the first number in the range refers to horns and the second number to size, the trait to which most respondents attached importance.

10.8 Goals

Discussions were held among the team before this preliminary analysis was undertaken, on the types of reports that would be required from a FAnGR survey. The goals are given in section 2.1 of Chapter 2. Eight specific areas were identified for which reports would be required. It is of interest now to look back and see what gaps remain. The eight specific areas defined are described below. Alongside each item references are given to the tables in this chapter which go some way to answering the questions posed.

1. a) What breeds or types of animals exist, in what numbers, and where are they? *(Tables 10.13-14, 10.16-20).*
   b) What do they look like? *(Tables 10.23-27)*.
   c) What is the environment in which the breed of animals are raised in terms of prevalent diseases, agro-ecological zone etc.? *(Tables 10.10-11 consider disease).*
   d) For what purposes are cattle used, how are they bred and by which farmers? *(Tables 10.4, 10.22).*
   e) What are farmers' opinions on the main attributes of the breeds, in particular in their adaptation to heat, drought and disease tolerance? *(Tables 10.28-30).*
   f) What are the animals' performance characterisations in terms of reproduction and prolificacy? *(Table 10.15 in relation to reproduction).*
   g) How are the herds/flocks structured? *(Table 10.21).*

2. Identification of threatened/endangered breeds, i.e. where are the pockets of pure-bred cattle to focus on for conservation? *(Preliminary data in Tables 10.16, 10.18-20).*

3. What are the gender roles in livestock production? *(Tables 10.5-8).*

4. How are the livestock managed in terms of housing, watering, feeding, castration, culling and disease control? *(Some data in Tables 10.9-11, 10.29).*

5. What are the socio-cultural practices and indigenous knowledge used in raising and managing livestock? *(Not attempted).*

6. What is the influence of external factors such as proximity to marketing/urban areas, commercial farms and bordering countries? *(Preliminary data in Table 10.19).*

7. Planning a policy framework on livestock production such as classification of different production systems, areas that need attention for conservation and full characterisation of types and strains of livestock *(Preliminary data in Tables 10.2-4, 10.7, 10.16, 10.18, 10.20, 10.23-27, 10.30).*

8. Planning breed improvement strategies *(Not attempted).*

As can be seen, attempts have been made to answer many of these questions, but there is a long way to go, not only for cattle but for the other species too!

10.9 Final comments

As mentioned at the outset this chapter gives only a flavour of the types of analysis that can be achieved. Many of the data can be summarised in the form of simple two-way tables using the Access query facility as shown in Chapter 9. More complicated analyses benefit from the use of a more advanced statistical package such as SAS, Genstat, SPSS or Stata. Care is needed, however, in the management of the data to ensure that the appropriate samples of households are being used for each analysis and, that when different parts of the database are merged, this is done correctly. A thorough understanding of the structure of the data system as described in Chapter 7 is needed. Table 10.12 illustrates some of the complexities in the analysis.

Simple statistical techniques, apart from those used for the estimation of population sizes, will generally be sufficient, e.g. simple analysis of variance tables or χ^2 tests. If comparisons require that data be classified in two or more dimensions, e.g. both breed and province, then the methods of least squares analysis of variance or logistic regression may be required. As mentioned earlier, multivariate and cluster techniques may be useful for classifying 'breeds' based on their phenotypic data. This has been particularly useful in the survey mentioned earlier in Ethiopia where indigenous knowledge of breed names was scanty. The method may also be useful for the interpretation of the data for chickens in this survey in Zimbabwe for which little is known about indigenous breeds. A few figures (diagrams) have been used in this chapter to provide further insight into the results and to illustrate other forms of data presentation. GIS analysis will be essential for studying geographical associations. GPS data were not ready for computer entry at the time this analysis was done.

The necessity for continued investigation of unusual data values spotted during the analysis cannot be overemphasised. On a number of occasions suggestions have been made during this chapter as to when raw data need to be checked. SAS was used for most of the analysis and was found to have the extra power needed to handle the relatively complex data structure. As mentioned above the availability of an advanced statistical package will be necessary for detailed analysis of a FAnGR survey. Excel is also a very useful package to have at hand. Its exploratory facilities, together with its pivotal table and graphical features, were found to be particularly useful during the preliminary analysis of the Zimbabwe data for identifying households with unusual data values. However, care is needed in the use of this software to ensure that the correct subsets of the data are used. As described in Chapter 9 a number of standard output tables have also been provided as part of the database to enable the user to make simple data queries.

Finally, it needs to be restated that the intention of this chapter has been simply to give some guidelines regarding possible approaches to the analysis. Data from the survey in Zimbabwe have been used to illustrate the approaches. Many of these data, however, will need to have been verified before a report can be finalised for all eight provinces sampled in the Zimbabwe FAnGR. A revised analysis of these data will provide a basis for the Zimbabwe national report, which hopefully can still be prepared despite the political circumstances in the country.

10.10 Appendix: Estimation of population size in a ward for a given species together with its standard error

The formulae for estimating the total number of animals of a given species in a ward, *T,* say, and its standard error, are essentially extensions of those described in section 2.5 of Chapter 2, except that, because the numbers of households in a village will vary, incorporation of village size, M_i, say, in the formulae will usually help to improve the precision of the estimates. Let $T_1,\ldots,T_r$ to be the estimated totals for *r* villages sampled as derived in Section 2.5, and $M_1,\ldots,M_r$ to be the numbers of households in the villages. (In the Zimbabwe survey *r* was defined throughout to be 2). The estimated average number of animals per household across the two villages can then be written:

$$\bar{y} = (T_1 + \ldots + T_r) / (M_1 + \ldots + M_r)$$

Suppose there to be *K* villages in the ward and numbers of households with livestock M_i is known in each of the villages that were not sampled. Then the best estimate of the total for the ward is

$$T = \bar{y} \sum^{K} M_i$$

If the sizes of all villages are not known then the best estimate of $\sum^{K} M_i$ is $K(M_1+\ldots+M_r)/r$. The among village component of the variance of *T* is calculated as $U=K(K-r)S^2/r$ where S^2 is the variance among $T_1,\ldots,T_r$, which can simply be calculated as

$$S^2 = [(T_1 - \bar{y} M_1)^2 + \ldots + (T_r - \bar{y} M_r)^2] / (r-1)$$

This is using a method known as 'ratio estimation' which assumes that the total number of animals in a village T_i is proportional to the number of households M_i.

To this we need to add the within village component of the variance calculated over the three wealth groups as given in section 2.5 of Chapter 2. If we write these variances as $V_1,\ldots,V_r$, respectively, for the *r* sampled villages, where

$$V_r = \sum [N_{rj} (N_{rj} - n_{rj}) S_{rj}^2 / n_{rj}]$$

and N_{rj}, n_{rj} and S^2_{rj} are the number of household in wealth group *j* ($N_{r1} + N_{r2} + N_{r3} = M_r$), the number of households sampled, and the sample variance for *j* = 1, 2, 3, respectively, then the formula for the variance of *T,* the estimated total number of animals in the ward, is

$$U + K (V_1+\ldots+V_r) / r$$

The standard error is the square root of this expression.

The application of the above formulae to two wards from the Matebeleland provinces with *M = 7* and *M = 5* villages, respectively, is illustrated in section10.6.1 and Table 10.14.

CHAPTER 11

Conducting a livestock breed survey – good survey practice

Advice on good survey practice is given throughout this report. In particular, Chapter 6 highlights a number of lessons learned during the execution of the Zimbabwe survey. Before embarking on a similar survey it is recommended that a coordinator takes careful note of the contents of that chapter, in particular Tables 6.2 and 6.3 which describe the steps and tasks required for the execution of a FAnGR survey and indicate some of the costs and expenses likely to be involved. In this final chapter we emphasise again some of the key aspects involved in the planning and execution of a livestock breed survey that are required to ensure that results can be successfully analysed and interpreted.

11.1 Planning for the main survey

- Definition of objectives These are set out in Section 2.1 of Chapter 2. It is essential that these be prioritised at the outset for their ranking can influence the design of the survey. The different objectives set out in Section 2.1 need to be assessed for their relative importance for each species and against the available budget.

- Creation of public awareness This is most important, not only at the community level, but also for informing the key stakeholders – both governmental and non-governmental organisations – who will be interested in the results of the survey. Various stakeholders may be able to offer assistance in the execution of the survey itself or in the implementation of recommendations resulting from the survey. Their inputs could be invaluable. The creation of stakeholder awareness can be both through preparatory workshops and the media. Prior visits to the communities to be involved in the survey are necessary to ensure their full cooperation. Often this can be achieved through the execution of a pre-survey.

- Investigation of sources of ancillary population statistics It is important to investigate early on whether data are available from previous censuses or surveys which may provide indications of population size, either human, livestock or both. These will be useful for both the design of the survey and the estimation of breed population numbers. Indeed, without some indication of livestock population statistics, satisfactory estimation of sizes of populations of individual breeds within a given species may be difficult to achieve.

- Revisions to questionnaire Prioritising of the survey objectives will determine what modifications, if any, are needed to the questionnaire. Modifications to the design of the questionnaire may require changes to be made to Breedsurv, the data capture software. These may be easy to do, but the early involvement of a statistical/computing expert is recommended for advice on this.

- Execution of pilot surveys These are important, not only for the pre-testing of any modifications that have been made to the questionnaire, but also in bringing to the team's attention the nature of problems likely to occur when the main survey is executed. A translation of the questionnaire into a local language may be useful in some cases to assist in the interviewing process. A pre-survey gives an opportunity to evaluate the accuracy of the translated version of a questionnaire alongside the one prepared in English (or other national or official language used). Interview length can also be tested. From experience it is advised that this should not exceed one to one and a half hours for each household.

- Organisation of pre-surveys These are important for the collection of information on number of households with livestock in a village and for the grouping of households into wealth categories. Information on village size is essential for estimation of livestock numbers at the village level.

11.2 Survey design

- Sampling frame The structure of the sampling frame, from which samples are to be drawn, requires careful thought. The sampling frame is likely to be built on a hierarchal administrative system with units suitable for sampling (e.g. district, ward, village) at each layer of the hierarchy. Identification of appropriate strata (e.g. agro-ecological zone, farming system, livestock density) to be built into the sampling frame should also be done at the outset. All this needs careful documentation as illustrated in Chapter 2. The services of a statistician will be critical at this stage.

- Choice of sample Methods for selection need to be carefully considered in conjunction with the survey objectives. A mixture of *representativ*e and *random* sampling is likely to be appropriate as outlined in Chapter 2, possibly with occasional cases of *purposive* and *convenience* sampling too. The emphasis should be on random sampling, especially at the lower layers of the hierarchy. Only from random samples can inferences be drawn about the overall population size. The numbers of households to be sampled will depend both on the goals of the survey and on the available resources. It is recommended, however, that the sampling fraction (i.e. the proportion of units, namely households, villages, wards etc., that are sampled) be greater at the upper than the lower layers of the hierarchy. If population estimation is an important objective then, as far as possible, sample size should also be proportional to stratum size. Again careful documentation is needed to describe how each sampling unit is chosen.

11.3 Selection of enumerators and their training

- Selection of enumerators. The success of a FAnGR survey depends largely, as outlined in Chapter 5, on the quality of the enumerators. Criteria for their selection are given in that chapter. Familiarity with the local area where the survey is to be conducted is an important attribute; indeed an enumerator should

be preferably known to the local community. Selection of suitable enumerators requires early attention during the planning stage.

- Training courses Training courses will need to be organised for enumerators and their supervisors together. It is recommended that a training course lasts five days so that sufficient time is allowed for supervisors and enumerators to become familiar with the contents of the questionnaire and to have ample time for practice. Three-day courses for training both in Zimbabwe and Ethiopia were found to be too short. There must also be opportunities during the courses for interviewing practice with local farmers. A suitable course structure is outlined in Table 5.1 of Chapter 5.

11.4 Execution of main survey

- Timing It is important to ensure that the survey is timed not to coincide with times when farmers are preoccupied with other activities. Survey management is easier during dry seasons when road access to villages is better. When working at the village level note must be taken of market days, religious days etc. when the household head may be away from his home.

- Supervision Good communication should be maintained at all times among the survey project team, supervisors and enumerators. The responsibilities at each level of supervision need to be identified and clarified during the training course. It is essential that members of the project team makes regular visits to each of the main field sites to resolve problems, review completed questionnaires etc.

11.5 Analysis and reporting of survey results

- Data entry and analysis The time for this must not be underestimated and plans for its organisation must be made at the outset. A survey does not end when the data are collected. Responsibilities for data coding between the central coordinating office and the survey supervisors must be determined before the survey starts. Depending on the size of the survey these tasks could take as long as three times (or greater) the amount of time allocated for the field work.

- Feedback As soon as results are available, a workshop should be organised to provide feed back to the key people involved in the implementation of the survey so that they cannot only be informed of the results of the survey but also be able to provide additional information useful for the final report. Funding for such a workshop should be budgeted at the start. It will also be good to provide brief reports highlighting some of the main results for other field staff. The importance of good feed back cannot be overemphasised.

11.6 Time-table

Finally, it is recommended that a time-table be prepared outlining the sets of goals and deadlines for the completion of each activity. A period of 6 months should be allowed for the planning phase, 3 months for the execution of the survey and 12 months for data entry, analysis and report writing. Depending on the size of the survey the planning and data analysis phases can even take longer. The complexity of a comprehensive livestock breed survey such as that undertaken in Zimbabwe cannot be underestimated. Indeed, as this report has demonstrated, the implementation of a FAnGR survey is not an easy task.

APPENDIX 1

Questionnaires used in Phase 2 of the Zimbabwe Survey

The following pages contain the questionnaires used in Phase 2 of the Zimbabwe FAnGR survey for each of the six species, cattle, sheep, goats, pigs, chickens and donkeys, when considered as the primary species for the interview. The heading on the title page indicates the primary species. The questions on the following ten or so pages refer to this primary species. The last three pages on Breed/age/sex/structure (pure breeds and mixed crosses) and Phenotypic description are then repeated for each of the remaining five species (in a different order for each primary species) and put together to complete the questionnaire booklet. The enumerator selects two of these species, roughly in the order that they occur, for inclusion as secondary species for the interview. Sometimes when an interview at a household takes longer than usual just one additional species is included as a secondary species.

The construction of the questionnaire booklet for each primary species and the five secondary species is described in Table 4.1 of Chapter 4.

MANAGEMENT OF FARM ANIMAL GENETIC RESOURCES IN THE SADC REGION

SADC/UNDP/FAO PROJECT RAF/97/032
National Department of Agriculture
Private Bag XI38, Pretoria, South Africa
TEL: (27-12) 319-7424/7622; FAX: (27-12) 329-7220

ZIMBABWE FARM ANIMAL GENETIC RESOURCES SURVEY

QUESTIONNAIRE - CATTLE

Enumerator Name _____ Code no. ☐ Date of interview / /

Supervisor Name _____ Code no. ☐

1. Province Name _____ Code no. ☐

2. District Name _____ Code no. ☐

3. Ward Name _____ Code no. ☐

4. Village (VIDCO) Name _____ Code no. ☐

5. Farm type Communal ☐ Small-scale commercial ☐ Large-scale commercial ☐

6. GPS reading _____ *(to be filled in later)* **7. Household** No ☐

8. Wealth category | rich | medium | poor | not classified | *(tick one)*

The overall objective of the survey, which is to be repeated in other SADC countries, is to obtain reliable estimates of population size and distribution of farm animal breed resources as well as to determine management/ production and socio-cultural practices employed by farmers in raising these animals. The surveys will enable simple, regular updating of breed information and facilitate updating of the databank on the FAO DAD-IS system. With this information, countries will be able to:

- develop comprehensive plans for the management of FAnGR,
- develop and harmonize support policies for FAnGR Management,
- facilitate development of appropriate animal recording systems and sustainable breeding programs,
- facilitate development and implementation of relevant conservation activities.

The activity is jointly funded by UNDP through the SADC FAnGR Program (**RAF/97/032)** and the Governments of Norway and Finland through the FAO Integrated Support to Sustainable Development and Food Security Program (**GCP/INT/694 NOR).**

The survey in Zimbabwe is being conducted by Matopos Research Station, in collaboration with the University of Zimbabwe and with the support of the International Livestock Research Institute.

1. Interviewee _____

Position in household
1. Household head ☐
2. Spouse of head ☐
3. Brother ☐
4. Sister ☐
5. Son ☐
6. Daughter ☐

Other (specify)

7. _____ ☐

2. Household head

Sex of head
Male ☐
Female ☐

Age (yrs)
≤ 30 ☐
31-40 ☐
41-50 ☐
51-60 ☐
61-70 ☐
> 70 ☐
Not known ☐

3. Tribe

Name _____

Code ☐

4. Number of people residing in household

Males ☐
Females ☐
Children < 15 yrs ☐

5. Land holding / farm size
(enter X in box in first column if not known)

	Area	Units *(tick)*	
Crops	☐	Acres	☐
Grazing *	☐	Hectares	☐
Forest	☐		

Total size ☐
* Other than communal

6. Land ownership
(Tick one or more)

Own ☐
Lease ☐
Other ☐ (specify) _____

7. Livestock activity

Is livestock the major activity on your farm?
Yes ☐ No ☐

8. Sources of income

(Tick first column as appropriate, rank level of source of income in second column – 1 highest.)

1. Crops	☐	☐
2. Livestock and products *	☐	☐
3. Home industries	☐	☐
4. Salary / wages	☐	☐

Other (specify)

5. _____ ☐ ☐

* Include the value of non-cash outputs or products e.g. manure, traction etc.

9. Livestock kept
(enter numbers in first column)

	Numbers	Most important species *(rank up to 3: (1, 2, 3)*
1. Cattle	☐	☐
2. Sheep	☐	☐
3. Goats	☐	☐
4. Chickens †	☐	☐
5. Pigs	☐	☐
6. Donkeys	☐	☐

Other (specify)

7. _____ ☐ ☐

† Adult birds only

10. Livestock production category
(Divide numbers given in question 9. into the following categories)

	Dairy	Meat	Dual purpose
1. Cattle	☐	☐	☐
2. Sheep	☐	☐	☐
3. Goats	☐	☐	☐

System of production *(Tick one or more)*

1. Industrial/intensive ... ☐
2. Semi-intensive …….. ☐
3. Extensive/pastoral … ☐
4. Free range / backyard ☐

Other (specify)

5. _____ ☐

2. Mobility *(Tick one or more)*

1. Sedentary ……. ☐
2. Transhumant … ☐
3. Nomadic …….. ☐

Other (specify)

4. _____ ☐

3. Purpose of keeping cattle

Ask an open question and tick any purpose considered in first half of box - one or more boxes to be ticked. Then rank top three by writing in second half of a box 1 for primary purpose, 2 for second, 3 for third.

1. Meat ……...	☐	☐
2. Milk ……...	☐	☐
3. Work/draft ……..…	☐	☐
4. Stud breeding ……	☐	☐
5. Manure ……..…….	☐	☐
6. Blood ……..……	☐	☐
7. Hide ……..……..	☐	☐
8. Cash from sales ….	☐	☐
9. Investment ……..…	☐	☐
10. Dowry ……..…..	☐	☐
11. Ceremonies ……...	☐	☐
12. Cultural ……..……	☐	☐

Other (specify)

13. _____ ☐☐

4. Members of household who own cattle *(Tick one or more)*

Head …….. ☐
Spouse …… ☐
Head/spouse together … ☐
Sons ……... ☐
Daughters …….. ☐
Others * ……. ☐

* Describe _____

5. Members of household responsible for cattle activities
(Tick as appropriate; more than one column in a row may be ticked)

	Adults Males	Adults Females	Boys (<15y)	Girls (<15y)	Hired labour
1. Purchasing cattle ……	☐	☐	☐	☐	☐
2. Selling / slaughtering cattle	☐	☐	☐	☐	☐
3. Herding ……..	☐	☐	☐	☐	☐
4. Breeding decisions ……	☐	☐	☐	☐	☐
5. Feeding ……..	☐	☐	☐	☐	☐
6. Milking ……..	☐	☐	☐	☐	☐
7. Making dairy products …..	☐	☐	☐	☐	☐
8. Selling dairy products ……	☐	☐	☐	☐	☐
9. Animal health ……	☐	☐	☐	☐	☐
Other (specify)					
10. _____	☐	☐	☐	☐	☐

6. Grazing/feeding

	Dry season	Wet season
1. Herded ……..	☐	☐
2. Paddock …….	☐	☐
3. Tethered ……	☐	☐
4. Stall ……	☐	☐
5. Yard ……...	☐	☐
6. Free grazing ..	☐	☐
Other (specify)		
7. _____	☐	☐

Are calves grazed/fed together with adults? Yes ☐ No ☐

7. Housing

	Dry season	Wet season
1. Kraal …….	☐	☐
2. Stall/shed ..	☐	☐
3. Yard ……..	☐	☐
4. None …….	☐	☐
Other (specify)		
5. _____	☐	☐

Are calves housed together with adults?
Yes ☐ No ☐

If animals not housed go to question 10.

8. Materials used for housing
(Tick one or more)

1. Untreated wood/bush … ☐
2. Treated wood …… ☐
3. Iron sheets …… ☐
4. Bricks …….. ☐
5. Mud ……. ☐
6. Wire …….. ☐

Other (specify)

7. _____ ☐
8. _____ ☐

9. Form of housing
(Tick if present)

1. Roof ☐
2. Solid wall ☐
3. Floor
   a. concrete ☐
   b. wooden ☐
   c. earth ☐

10. Supplementation regime
(Tick as appropriate)

	Dry season	Wet season
1. Roughage/crop residue ……..	☐	☐
2. Minerals (salts) / vitamins …	☐	☐
3. Bought-in feed / concentrates	☐	☐
4. None ……..	☐	☐
Other (specify)		
5. _____	☐	☐
6. _____	☐	☐

11. How cattle are watered

	Dry season	Wet season
1. Animals go to water …….	☐	☐
2. Water is fetched/provided	☐	☐
3. Both …….	☐	☐

12. Source of water
(Tick one or more)

	Dry season	Wet season
1. Borehole ……	☐	☐
2. Dam/pond …….	☐	☐
3. River …….	☐	☐
4. Water well …….	☐	☐
5. Spring ……	☐	☐
6. Municipal/piped ……	☐	☐
Other (specify)		
6. _____	☐	☐

13. Distance to farthest watering point

	Dry season	Wet season
1. At household ……..	☐	☐
2. <1km ……..	☐	☐
3. 1-5 km ……	☐	☐
4. 6-10 km ……..	☐	☐
5. >10 km ……..	☐	☐

14. Frequency of watering

	Dry season	Wet season
1. Freely available ……..	☐	☐
2. Once a day ……..	☐	☐
3. Twice a day ……	☐	☐
4. Every other day ……..	☐	☐
5. Once in 3 days ……	☐	☐
Other (specify)		
6. _____	☐	☐

15. Water quality
(Tick one or more)

	Dry season	Wet season
1. Good/clear ……	☐	☐
2. Muddy ……..	☐	☐
3. Salty …….	☐	☐
4. Smelly ……..	☐	☐

1. Access to veterinary services *(Tick as appropriate)*

1. Government vet. ☐
2. Private vet. ☐
3. Veterinary drug supplier ☐
4. Extension service ☐
5. None ☐

Other (specify)

6. _____ ☐

2. Prevalent diseases that occur on farm
(i.e. diseases that are seen by farmer in his animals)

If none tick this box ☐

Local name or symptoms of disease *(Rank, most common first)*	Code *	Are animals treated when sick? Yes	No	Treatment given (if known)	Code *
1.					
2.					
3.					
4.					
5.					
6.					

**(codes to be entered later from lists of diseases and treatments)*

3. Vaccinations/preventive treatments given

If none tick this box ☐

Local name or symptoms of disease	Code *	Done routinely *(Tick as appropriate)*	Done when need arises
1.			
2.			
3.			
4.			
5.			
6.			

**(code to be entered later from list of diseases)*

4. Ectoparasite control

Method	(Tick)	Done when need arises: dry season	Done when need arises: wet season	Done routinely: dry season	Done routinely: wet season	If done routinely specify how often: dry season	If done routinely specify how often: wet season
1. None	☐						
2. Dip	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
3. Spray	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
4. Pour-on	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
5. Hand dressing	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
6. Injectables	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
7. Traditional	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

If traditional method specify _____ Code ☐ *(to be entered from list of traditional methods)*

Other (specify)

8. _____	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

5. Trypanosomosis control

Method	(Tick)	Done when need arises: dry season	Done when need arises: wet season	Done routinely: dry season	Done routinely: wet season	If done routinely specify how often: dry season	If done routinely specify how often: wet season
1. None (n/a)	☐						
2. Chemotherapy	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
3. Pour-on	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
4. Traditional	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

If traditional method specify _____ Code ☐

Other (specify)

5. _____	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

6. Intestinal parasite control

Method	(Tick)	Done when need arises: dry season	Done when need arises: wet season	Done routinely: dry season	Done routinely: wet season	If done routinely specify how often: dry season	If done routinely specify how often: wet season
1. None	☐						
2. Drench	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
3. Traditional	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

If traditional method specify _____ Code ☐

Other (specify)

4. _____	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

1. Castration

Do you castrate? Yes ☐
No ☐

If yes, say why. (*Tick one or more boxes)*

1. Control breeding …….. ☐
2. Improve meat quality ….. ☐
3. Better price …….. ☐
4. Better draft power …… ☐
5. Better temperament ……. ☐

Other (specify)

6. _____ ☐

and at what age?

< 3 months ☐
3-6 months ☐
6-12 months ☐
> 12 months ☐

4. Sale outlet *(if sold in last 12 months)*

Were animals sold? Yes ☐ No ☐

If yes tick one or more boxes.

1. Sold at auction ☐
2. Sold to butcher ☐
3. Sold privately ☐
4. Sold to abattoir ☐

Other (specify)

5. _____ ☐

2. Numbers of entries within last 12 months

For questions 2. and 3. first ask for information on calves and on others (i.e. weaners and adults total). Then complete individual columns for weaners and adults if known. Enter X in a box if not known, 0 if answer

	Calves	Weaners and Adults: Weaners	Adults: Males	Adults: Females	Total W + A
1. Born ……..	☐				
2. Bought ……..	☐	☐	☐	☐	☐
3. Donated/gift *	☐	☐	☐	☐	☐
4. Exchanged/lent	☐	☐	☐	☐	☐

** to include bride price and dowry*

3. Numbers of exits within last 12 months

	Calves	Weaners and Adults: Weaners	Adults: Males	Adults: Females	Total W + A
1. Died …….	☐	☐	☐	☐	☐
2. Sold …….	☐	☐	☐	☐	☐
3. Slaughtered ….	☐	☐	☐	☐	☐
4. Donated/gift *	☐	☐	☐	☐	☐
5. Exchanged/lent	☐	☐	☐	☐	☐
6. Stolen	☐	☐	☐	☐	☐

** to include bride price and dowry*

5. Reasons for culling / disposal

Ask as open question and tick any answers given in first *half of box, one or more boxes to be ticked. Then rank top three by writing in second half of box 1 for primary reason for culling, 2 for second and 3 for third.*

	Males	Females
1. Size ……	☐☐	☐☐
2. Conformation / shape ……	☐☐	☐☐
3. Colour ……	☐☐	☐☐
4. Temperament …….	☐☐	☐☐
5. Health …….	☐☐	☐☐
6. Body condition ……..	☐☐	☐☐
7. Performance ……..	☐☐	☐☐
8. Old age ……...	☐☐	☐☐
9. Poor fertility ……...	☐☐	☐☐

Other (specify)

10. _____	☐☐	☐☐
11. _____	☐☐	☐☐

1. Primary reason for keeping bull(s)
(Tick one)

1. Breeding …… ☐
2. Socio-cultural …… ☐
3. Work / draft ……... ☐

Other (specify)

4. _____ ☐

2. Reasons for choice of bull(s) for breeding
If breeding not done proceed to next page.

Ask an open question and tick any reason for choice
considered in first half of box, one or more boxes to be ticked. Then rank top three by writing in second half of box 1 for primary reason for choice, 2 for second and 3 for third.

1. Size …… ☐☐
2. Conformation/shape …… ☐☐
3. Colour ……. ☐☐
4. Horns …….. ☐☐
5. Temperament …….. ☐☐
6. Performance …… ☐☐
7. Availability (no choice) ……... ☐☐

Other (specify)

8. _____ ☐☐

3. Mating

(Tick one or more boxes)

1. Uncontrolled ☐
2. Hand mating ☐
3. Group mating ☐
4. A.I. ☐

Other (specify)

5. _____ ☐

4. Source and breed(s) of bull(s) used in the herd

Breed name(s) *(specify if known – crosses can be included.)*

Tick one or more boxes		**Breed type 1 (pure or cross)** **Common name**	Code*	**Breed type 2 (pure or cross)** **Common name**	Code*
1. Own bull (bred)	☐	_____	☐☐	_____	☐☐
2. Own bull (bought)	☐	_____	☐☐	_____	☐☐
3. Bull donated	☐	_____	☐☐	_____	☐☐
4. Bull borrowed	☐	_____	☐☐	_____	☐☐
5. A.I.	☐	_____	☐☐	_____	☐☐
6. Communal area bull	☐	_____	☐☐	_____	☐☐

**(code to be entered from list of breeds – use first box only if pure breed, two boxes if bull is a crossed breed)*

Number of pure breeds * | 0 | 1 | 2 | 3 | 4 | 5 | *(tick)*

** If crossing of two breeds has resulted in a genotype that is recognised and maintained as a breed, then count this as a separate breed and include it on this form. If no pure breeds tick 0 in box and complete section on mixed crosses form. If more than two pure breeds, third breed can be entered on mixed crosses form.*

BREED 1 Code ☐ *(from list of breeds)*

1. Common breed name _____

Local breed name _____

2. Trend within herd *(tick one)*

Increasing ☐ Decreasing ☐
Stable ☐ Unknown ☐

3. Numbers by age and sex
(enter X in box if not known)

	Calves	Weaners	Adults
Intact male	☐	☐	☐
Castrate	☐	☐	☐
Female	☐	☐	☐

How old is the oldest animal? ☐ years

4. Origin/source of breed

1. Inherited ☐
2. Communal area farm ☐ * *specify location if known*
3. Commercial farm * ☐ _____
4. Market * ☐

5. Quality of traits perceived by owner
(Ask each question and for each trait tick one box, poor, average, good, no opinion)

BREED 2 Code ☐ *(from list of breeds)*

1. Common breed name _____

Local breed name _____

2. Trend within herd *(tick one)*

Increasing ☐ Decreasing ☐
Stable ☐ Unknown ☐

3. Numbers by age and sex
(enter X in box if not known)

	Calves	Weaners	Adults
Intact male	☐	☐	☐
Castrate	☐	☐	☐
Female	☐	☐	☐

How old is the oldest animal? ☐ years

4. Origin/source of breed

1. Inherited ☐
2. Communal area farm ☐ * *specify location if known*
3. Commercial farm * ☐ _____
4. Market * ☐

5. Quality of traits perceived by owner
(Ask each question and for each trait tick one box , poor, average, good, no opinion)

Poor	Average	Good	No opinion/ not important		Poor	Average	Good	No opinion/ not important
☐	☐	☐	☐	1. Size	☐	☐	☐	☐
☐	☐	☐	☐	2. Conformation/shape	☐	☐	☐	☐
☐	☐	☐	☐	3. Colour	☐	☐	☐	☐
☐	☐	☐	☐	4. Horns	☐	☐	☐	☐
☐	☐	☐	☐	5. Disease tolerance	☐	☐	☐	☐
☐	☐	☐	☐	6. Drought tolerance	☐	☐	☐	☐
☐	☐	☐	☐	7. Heat tolerance	☐	☐	☐	☐
☐	☐	☐	☐	8. Temperament	☐	☐	☐	☐
☐	☐	☐	☐	9. Work rate/draft power	☐	☐	☐	☐
☐	☐	☐	☐	10. Milk yield	☐	☐	☐	☐
☐	☐	☐	☐	11. Meat	☐	☐	☐	☐
☐	☐	☐	☐	12. Growth rate	☐	☐	☐	☐
☐	☐	☐	☐	13. Fertility	☐	☐	☐	☐

Other (specify)

☐	☐	☐	☐	14. _____	☐	☐	☐	☐

This form is also designed for a third pure breed. If there are fourth or fifth pure breeds add the information to this or previous sheets writing alongside the boxes for breed 1, 2 or 3.

BREED 3 Code ☐
(from list of breeds)

1. Common breed name _____

Local breed name _____

2. Trend within herd *(tick one)*

Increasing ☐ Decreasing ☐
Stable ☐ Unknown ☐

3. Numbers by age and sex
(enter X in box if not known)

	Calves	Weaners	Adults
Intact male	☐	☐	☐
Castrate	☐	☐	☐
Female	☐	☐	☐

How old is the oldest animal? ☐ Years

4. Origin/source of breed

1. Inherited ☐
2. Communal area farm ☐ * *specify location if known*
3. Commercial farm * ☐ _____
4. Market * ☐

5. Quality of traits perceived by owner
(Ask each question and for each trait tick one box poor, average, good, no opinion)

MIXED CROSSES

1. Breeds apparently used to produce mixed crosses in herd *(rank up to four breeds in order of probable influence – use owner's knowledge if known)*

Rank	*Code*	
1.	☐	Common name _____ Local name _____
2.	☐	Common name _____ Local name _____
3.	☐	*Common name* _____ Local name _____
4.	☐	Common name _____ Local name _____

or Unknown ☐

2. Numbers by age and sex
(enter X in box if not known)

	Calves	Weaners	Adults
Intact male	☐	☐	☐
Castrate	☐	☐	☐
Female	☐	☐	☐

How old is the oldest animal? ☐ Years

3. Quality of traits perceived by owner
(Ask each question and for each trait tick one box, poor, average, good, no opinion)

Poor	Average	Good	No opinion/ not important		Poor	Average	Good	No opinion/ not important
☐	☐	☐	☐	..... 1. Size	☐	☐	☐	☐
☐	☐	☐	☐	..... 2. Conformation/shape	☐	☐	☐	☐
☐	☐	☐	☐	..... 3. Colour	☐	☐	☐	☐
☐	☐	☐	☐	..... 4. Horns	☐	☐	☐	☐
☐	☐	☐	☐	..... 5. Disease tolerance	☐	☐	☐	☐
☐	☐	☐	☐	..... 6. Drought tolerance	☐	☐	☐	☐
☐	☐	☐	☐	..... 7. Heat tolerance	☐	☐	☐	☐
☐	☐	☐	☐	..... 8. Temperament	☐	☐	☐	☐
☐	☐	☐	☐	..... 9. Work rate/draft power	☐	☐	☐	☐
☐	☐	☐	☐	..... 10. Milk yield	☐	☐	☐	☐
☐	☐	☐	☐	..... 11. Meat	☐	☐	☐	☐
☐	☐	☐	☐	..... 12. Growth rate	☐	☐	☐	☐
☐	☐	☐	☐	..... 13. Fertility	☐	☐	☐	☐
				Other (specify)				
☐	☐	☐	☐	..... 14. _____	☐	☐	☐	☐

IF MORE THAN ONE PURE BREED SELECT ONE BREED.

1. Breed common name _____ **Code** ☐ *(from list of breeds)*

2. Coat description
Pattern *(1 or more ticks allowed)*: Uniform (1-colour) ☐; Uniform (multi-coloured) ☐; Pied ☐; Spotted ☐
Hair: Short ☐; Medium ☐; Long ☐; Straight ☐; Curly ☐

3. Colour *Enter number(s) from colour chart. Complete both halves of double box if animals have more than one colour, main colour first; complete first half only if uniform colour. Rank in order of frequency of colour combinations in animals.*

	Rank		Rank		Rank		Rank		Rank
Body	1. ☐☐	Head	1. ☐☐	Ear tips	1. ☐	Tail switch	1. ☐☐	Hoof	1. ☐☐
	2. ☐☐		2. ☐☐		2. ☐		2. ☐☐		2. ☐☐
	3. ☐☐		3. ☐☐		3. ☐		3. ☐☐		
	4. ☐☐		4. ☐☐					Muzzle	1. ☐☐
	5. ☐☐		5. ☐☐						2. ☐☐

4. Body Size

		Males	Females
Height	< 120 cm	☐	☐
	< 140 cm	☐	☐
	< 160 cm	☐	☐
	> 160 cm	☐	☐
Length	< 130 cm	☐	☐
	< 150 cm	☐	☐
	< 170 cm	☐	☐
	> 170 cm	☐	☐

5. Dewlap Absent ☐; Small ☐; Medium ☐; Large ☐

6. Hump

	Males	Females
Absent	☐	☐
Small	☐	☐
Medium	☐	☐
Large	☐	☐

Orientation: Erect ☐; Bent sideways ☐
Location: Thoracic ☐; Cervico-thoracic ☐

7. Profile
Face *(1 or more ticks allowed)*: Flat ☐; Concave ☐; Convex ☐
Back: Hollow ☐; Straight ☐
Rump: Flat ☐; Sloping ☐; Roofy ☐

8. Horns

	M	F
Present in all	☐	☐
Present in some	☐	☐
Absent	☐	☐

Shape *(1 or more ticks allowed)*: Straight ☐; Curved ☐; Lyre-shaped ☐; Spiral ☐
Orientation *(1 or more ticks allowed)*: Upward ☐; Forward ☐; Backward ☐; Lateral ☐; Downward ☐

Spacing: Narrow ☐; Wide ☐
Length: Short (<15 cm) ☐; Medium (15-30 cm) ☐; Long (>30 cm) ☐

9. Naval flap Absent ☐; Small ☐; Medium ☐; Large ☐

10. Ears
Size: Small ☐; Large ☐
Shape: Round-edged ☐; Straight-edged ☐
Orientation (in relaxed state): Erect ☐; Lateral ☐; Drooping ☐

11. Tail
Length: Short (above the hock joint) ☐; Medium (at the hock joint) ☐; Long (below the hock joint) ☐
Thickness at base: Narrow ☐; Medium ☐; Wide ☐

12. Udder Size: Small ☐; Medium ☐; Large ☐

13. Teats Rudimentory (hard to hold between thumb and index finger) ☐; Medium (can easily be held between thumb and index finger) ☐; Large (can be held between multiple fingers and thumb) ☐

MANAGEMENT OF FARM ANIMAL GENETIC RESOURCES IN THE SADC REGION

SADC/UNDP/FAO PROJECT RAF/97/032
National Department of Agriculture
Private Bag XI38, Pretoria, South Africa
TEL: (27-12) 319-7424/7622; FAX: (27-12) 329-7220

ZIMBABWE FARM ANIMAL GENETIC RESOURCES SURVEY

QUESTIONNAIRE - SHEEP

Enumerator Name _____ Code no. ☐ Date of interview / /

Supervisor Name _____ Code no. ☐

1. Province Name _____ Code no. ☐

2. District Name _____ Code no. ☐

3. Ward Name _____ Code no. ☐

4. Village (VIDCO) Name _____ Code no. ☐

5. Farm type Communal ☐ Small-scale commercial ☐ Large-scale commercial ☐

6. GPS reading _____ *(to be filled in later)* **7. Household** No ☐

8. Wealth category | rich | medium | poor | not classified | *(tick one)*

The overall objective of the survey, which is to be repeated in other SADC countries, is to obtain reliable estimates of population size and distribution of farm animal breed resources as well as to determine management/ production and socio-cultural practices employed by farmers in raising these animals. The surveys will enable simple, regular updating of breed information and facilitate updating of the databank on the FAO DAD-IS system. With this information, countries will be able to:

- develop comprehensive plans for the management of FAnGR,
- develop and harmonize support policies for FAnGR Management,
- facilitate development of appropriate animal recording systems and sustainable breeding programs,
- facilitate development and implementation of relevant conservation activities.

The activity is jointly funded by UNDP through the SADC FAnGR Program (**RAF/97/032)** and the Governments of Norway and Finland through the FAO Integrated Support to Sustainable Development and Food Security Program (**GCP/INT/694 NOR).**

The survey in Zimbabwe is being conducted by Matopos Research Station, in collaboration with the University of Zimbabwe and with the support of the International Livestock Research Institute.

1. Interviewee _____

Position in household
1. Household head ☐
2. Spouse of head ☐
3. Brother ☐
4. Sister ☐
5. Son ☐
6. Daughter ☐

Other (specify)

7. _____ ☐

2. Household head

Sex of head
Male ☐
Female ☐

Age (yrs)
≤ 30 ☐
31-40 ☐
41-50 ☐
51-60 ☐
61-70 ☐
> 70 ☐
Not known ☐

3. Tribe

Name _____

Code ☐

4. Number of people residing in household

Males ☐
Females ☐
Children < 15 yrs ☐

5. Land holding / farm size
(enter X in box in first column if not known)

	Area	Units *(tick)*	
Crops	☐	Acres	☐
Grazing *	☐	Hectares	☐
Forest	☐		

Total size ☐

* Other than communal

6. Land ownership
(Tick one or more)

Own ☐
Lease ☐
Other ☐ (specify) _____

7. Livestock activity

Is livestock the major activity on your farm?
Yes ☐ No ☐

8. Sources of income

(Tick first column as appropriate, rank level of source of income in second column – 1 highest.)

1. Crops	☐	☐
2. Livestock and products *	☐	☐
3. Home industries	☐	☐
4. Salary / wages	☐	☐

Other (specify)

5. _____ ☐ ☐

* Include the value of non-cash outputs or products e.g. manure, traction etc.

9. Livestock kept
(enter numbers in first column)

	Numbers	Most important species *(rank up to 3: (1, 2, 3)*
1. Cattle	☐	☐
2. Sheep	☐	☐
3. Goats	☐	☐
4. Chickens †	☐	☐
5. Pigs	☐	☐
6. Donkeys	☐	☐

Other (specify)

7. _____ ☐ ☐

† Adult birds only

10. Livestock production category
(Divide numbers given in question 9. into the following categories)

	Dairy	Meat	Dual purpose
1. Cattle	☐	☐	☐
2. Sheep	☐	☐	☐
3. Goats	☐	☐	☐

1. System of production *(Tick one or more)*

1. Industrial/intensive ... ☐
2. Semi-intensive …….. ☐
3. Extensive/pastoral … ☐
4. Free range / backyard ☐

Other (specify)

5. _____ ☐

2. Mobility *(Tick one or more)*

1. Sedentary ……. ☐
2. Transhumant … ☐
3. Nomadic …….. ☐

Other (specify)

4. _____ ☐

4. Purpose of keeping sheep

Ask an open question and tick any purpose considered in first half of box - one or more boxes to be ticked. Then rank top three by writing in second half of a box 1 for primary purpose, 2 for second, 3 for third.

1. Meat ……... ☐☐
2. Wool …….…… ☐☐
3. Stud breeding …… ☐☐
4. Manure ……..…….. ☐☐
5. Blood ……..…… ☐☐
6. Skin ……..……... ☐☐
7. Fat ……. ☐☐
8. Pelt ……..…… ☐☐
9. Cash from sales …. ☐☐
10. Investment …..…... ☐☐
11. Dowry ……...…….. ☐☐
12. Ceremonies …… ☐☐
13. Cultural ……. ☐☐

Others (specify)

14. _____ ☐☐

4. Members of household who own sheep *(Tick one or more)*

Head ……. ☐
Spouse …….. ☐
Head/spouse together … ☐
Sons ……... ☐
Daughters ……... ☐
Others * ……. ☐

* Describe _____

5. Members of household responsible for sheep activities
(Tick as appropriate; more than one column in a row may be ticked)

	Adults Males	Adults Females	Boys (<15y)	Girls (<15y)	Hired labour
1. Purchasing sheep ……..	☐	☐	☐	☐	☐
2. Selling / slaughtering sheep	☐	☐	☐	☐	☐
3. Herding …….	☐	☐	☐	☐	☐
4. Breeding decisions ……	☐	☐	☐	☐	☐
5. Feeding ……..	☐	☐	☐	☐	☐
6. Shearing …….	☐	☐	☐	☐	☐
7. Animal health ……	☐	☐	☐	☐	☐
Other (specify)					
8. _____	☐	☐	☐	☐	☐

6. Grazing/feeding

	Dry season	Wet season
1. Herded ……..	☐	☐
2. Paddock …….	☐	☐
3. Tethered …….	☐	☐
4. Stall ……	☐	☐
5. Yard ……...	☐	☐
6. Free grazing ..	☐	☐
Other (specify)		
7. _____	☐	☐

7. Housing

	Dry season	Wet season
1. Kraal …….	☐	☐
2. Stall/shed ..	☐	☐
3. Yard ……..	☐	☐
4. None …….	☐	☐
Other (specify)		
5. _____	☐	☐

If animals not housed go to question 10.

8. Materials used for housing
(Tick one or more)

1. Untreated wood/bush … ☐
2. Treated wood …… ☐
3. Iron sheets …… ☐
4. Bricks …….. ☐
5. Mud ……. ☐
6. Wire …….. ☐

Other (specify)

7. _____ ☐
8. _____ ☐

9. Form of housing
(Tick if present)

1. Roof ☐
2. Solid wall ☐
3. Floor
   a. concrete ☐
   b. wooden ☐
   c. earth ☐

10. Supplementation regime
(Tick as appropriate)

	Dry season	Wet season
1. Roughage/crop residue ……..	☐	☐
2. Minerals (salts) / vitamins …	☐	☐
3. Bought-in feed / concentrates	☐	☐
4. None ……..	☐	☐
Other (specify)		
5. _____	☐	☐
6. _____	☐	☐

11. How sheep are watered

	Dry season	Wet season
1. Animals go to water …….	☐	☐
2. Water is fetched/provided	☐	☐
3. Both …….	☐	☐

12. Source of water
(Tick one or more)

	Dry season	Wet season
1. Borehole ……	☐	☐
2. Dam/pond …….	☐	☐
3. River …….	☐	☐
4. Water well ……	☐	☐
5. Spring ……	☐	☐
6. Municipal/piped ……	☐	☐
Other (specify)		
7. _____	☐	☐

13. Distance to farthest watering point

	Dry season	Wet season
1. At household ……..	☐	☐
2. <1km ……..	☐	☐
3. 1-5 km ……	☐	☐
4. 6-10 km ……..	☐	☐
5. >10 km ……..	☐	☐

14. Frequency of watering

	Dry season	Wet season
1. Freely available	☐	☐
2. Once a day ……	☐	☐
3. Twice a day …..	☐	☐
4. Every other day	☐	☐
5. Once in 3 days	☐	☐
Other (specify)		
6. _____	☐	☐

15. Water quality
(Tick one or more)

	Dry season	Wet season
1. Good/clear ……	☐	☐
2. Muddy ……...	☐	☐
3. Salty ……..	☐	☐
4. Smelly ……..	☐	☐

16. Flock management

Are sheep run together with cattle? Yes ☐ No ☐

1. Access to veterinary services
(Tick as appropriate)

1. Government vet. ☐
2. Private vet. ☐
3. Veterinary drug supplier ☐
4. Extension service ☐
5. None ☐

Other (specify)

6. _____ ☐

2. Prevalent diseases that occur on farm
(i.e. diseases that are seen by farmer in his animals)

If none tick this box ☐

Local name or symptoms of disease *(Rank, most common first)*	Code *	Are animals treated when sick? Yes	No	Treatment given (if known)	Code *
1.					
2.					
3.					
4.					
5.					
6.					

**(codes to be entered later from lists of diseases and treatments)*

3. Vaccinations/preventive treatments given

If none tick this box ☐

Local name or symptoms of disease	Code *	Done routinely *(Tick as appropriate)*	Done when need arises
1.			
2.			
3.			
4.			
5.			
6.			

**(code to be entered later from list of diseases)*

4. Ectoparasite control

Method	(Tick)	Done when need arises: dry season	Done when need arises: wet season	Done routinely: dry season	Done routinely: wet season	If done routinely specify how often: dry season	If done routinely specify how often: wet season
1. None	☐						
2. Dip	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
3. Spray	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
4. Pour-on	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
5. Hand dressing	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
6. Injectables	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
7. Traditional	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

If traditional method specify _____ Code ☐ *(to be entered from list of traditional methods)*

Other (specify)

8. _____	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

5. Trypanosomosis control

Method	(Tick)	Done when need arises: dry season	Done when need arises: wet season	Done routinely: dry season	Done routinely: wet season	If done routinely specify how often: dry season	If done routinely specify how often: wet season
1. None (n/a)	☐						
2. Chemotherapy	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
3. Pour-on	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
4. Traditional	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

If traditional method specify _____ Code ☐

Other (specify)

5. _____	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

6. Intestinal parasite control

Method	(Tick)	Done when need arises: dry season	Done when need arises: wet season	Done routinely: dry season	Done routinely: wet season	If done routinely specify how often: dry season	If done routinely specify how often: wet season
1. None	☐						
2. Drench	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
3. Traditional	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

If traditional method specify _____ Code ☐

Other (specify)

4. _____	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

1. Castration

Do you castrate? Yes ☐
No ☐

If yes, say why. (*Tick one or more boxes)*

1. Control breeding …….. ☐
2. Improve meat quality ….. ☐
3. Better temperament ……. ☐

Other (specify)

4. _____ ☐

and at what age?

< 3 months ☐
3-6 months ☐
6-12 months ☐
> 12 months ☐

4. Sale outlet *(if sold in last 12 months)*

Were animals sold? Yes ☐ No ☐

If yes tick one or more boxes.

1. Sold at auction ☐
2. Sold to butcher ☐
3. Sold privately ☐
4. Sold to abattoir ☐

Other (specify)

5. _____ ☐

5. Exchange

Would sheep ever be exchanged for cattle?
Yes ☐ No ☐

If yes, how many sheep for a bull ☐ , cow ☐ , calf ☐ ?

2. Numbers of entries within last 12 months

For questions 2. and 3. first ask for information on lambs and others (i.e. weaners and adults total). Then complete individual columns for weaners and adults if known. Enter X in a box if not known, 0 if answer is none.

	Lambs	Weaners and Adults: Adults: Weaners	Adults: Males	Adults: Females	Total W + A
1. Born ……..	☐				
2. Bought ……..	☐	☐	☐	☐	☐
3. Donated/gift * ..	☐	☐	☐	☐	☐
4. Exchanged/lent	☐	☐	☐	☐	☐

** to include bride price and dowry*

3. Numbers of exits within last 12 months

	Lambs	Weaners and Adults: Adults: Weaners	Adults: Males	Adults: Females	Total W + A
1. Died ……	☐	☐	☐	☐	☐
2. Sold …….	☐	☐	☐	☐	☐
3. Slaughtered ….	☐	☐	☐	☐	☐
4. Donated/gift *	☐	☐	☐	☐	☐
5. Exchanged/lent	☐	☐	☐	☐	☐
6. Stolen	☐	☐	☐	☐	☐

** to include bride price and dowry*

6. Reasons for culling / disposal

Ask as open question and tick any answers given in first *half of box, one or more boxes to be ticked. Then rank top three by writing in second half of box 1 for primary reason for culling, 2 for second and 3 for third.*

	Males	Females
1. Size ……	☐☐	☐☐
2. Conformation / shape ……	☐☐	☐☐
3. Colour ……	☐☐	☐☐
4. Temperament …….	☐☐	☐☐
5. Health …….	☐☐	☐☐
6. Body condition ……..	☐☐	☐☐
7. Performance ……..	☐☐	☐☐
8. Old age ……..	☐☐	☐☐
9. Poor fertility ……..	☐☐	☐☐

Other (specify)

10. _____	☐☐	☐☐
11. _____	☐☐	☐☐

1. Primary reason for keeping ram(s)
(Tick one)

1. Breeding …….. ☐
2. Socio-cultural …….. ☐

Other (specify)

3. _____ ☐

2. Reasons for choice of ram(s) for breeding
If breeding not done proceed to next page.

Ask an open question and tick any reason for choice
considered in first half of box, one or more boxes to be ticked. Then rank top three by writing in second half of box 1 for primary reason for choice, 2 for second and 3 for third.

1. Size …….. ☐☐
2. Conformation/shape …… ☐☐
3. Colour …….. ☐☐
4. Horns …….. ☐☐
5. Temperament …….. ☐☐
6. Performance …… ☐☐
7. Availability (no choice) …….. ☐☐

Other (specify)

8. _____ ☐☐

3. Mating

(Tick one or more boxes)

1. Uncontrolled …. ☐
2. Hand mating …. ☐
3. Group mating … ☐
4. A.I. …… ☐

Other (specify) ☐

5. _____ ☐

4. Prolificacy

Consider the lambs currently in your flock.

From how many ewes were they born? ☐

How many of these ewes had

singletons ☐
twins ☐
triplets ☐

5. Source and breed(s) of ram(s) used in the flock

Breed name(s) *(specify if known – crosses can be included.)*

Tick one or more boxes		**Breed type 1 Common name**	Code*		**Breed type 2 Common name**	Code*	
1. Own ram (bred) ….	☐	_____	☐	☐	_____	☐	☐
2. Own ram (bought) ..	☐	_____	☐	☐	_____	☐	☐
3. Ram donated ……..	☐	_____	☐	☐	_____	☐	☐
4. Ram borrowed ……	☐	_____	☐	☐	_____	☐	☐
5. A.I. …….	☐	_____	☐	☐	_____	☐	☐
6. Communal area ram	☐	_____	☐	☐	_____	☐	☐

**(code to be entered from list of breeds – use first box only if pure breed, two boxes if ram is a crossed breed)*

Number of pure breeds * | 0 | 1 | 2 | 3 | 4 | 5 | *(tick)*

** If crossing of two breeds has resulted in a genotype that is recognised and maintained as a breed, then count this as a separate breed and include it on this form. If no pure breeds tick 0 in box and complete section on mixed crosses form. If more than two pure breeds, third breed can be entered on mixed crosses form.*

BREED 1 Code ☐ *(from list of breeds)*

1. Common breed name _____

Local breed name _____

2. Trend within flock *(tick one)*

Increasing ☐ Decreasing ☐
Stable ☐ Unknown ☐

3. Numbers by age and sex
(enter X in box if not known)

	Lambs	Weaners	Adults
Intact male	☐	☐	☐
Castrate	☐	☐	☐
Female	☐	☐	☐

How old is the oldest animal? ☐ years

4. Origin/source of breed

1. Inherited ☐
2. Communal area farm ☐ * *specify location if known*
3. Commercial farm * ☐ _____
4. Market * ☐

5. Quality of traits perceived by owner
(Ask each question and for each trait tick, one box poor, average, good, no opinion)

BREED 2 Code ☐ *(from list of breeds)*

1. Common breed name _____

Local breed name _____

2. Trend within flock *(tick one)*

Increasing ☐ Decreasing ☐
Stable ☐ Unknown ☐

3. Numbers by age and sex
(enter X in box if not known)

	Lambs	Weaners	Adults
Intact male	☐	☐	☐
Castrate	☐	☐	☐
Female	☐	☐	☐

How old is the oldest animal? ☐ years

4. Origin/source of breed

1. Inherited ☐
2. Communal area farm ☐ * *specify location if known*
3. Commercial farm * ☐ _____
4. Market * ☐

5. Quality of traits perceived by owner
(Ask each question and for each trait tick one box , poor, average, good, no opinion)

Poor	Average	Good	No opinion/ not important		Poor	Average	Good	No opinion/ not important
☐	☐	☐	☐	1. Size	☐	☐	☐	☐
☐	☐	☐	☐	2. Conformation/shape	☐	☐	☐	☐
☐	☐	☐	☐	3. Colour	☐	☐	☐	☐
☐	☐	☐	☐	4. Horns	☐	☐	☐	☐
☐	☐	☐	☐	5. Disease tolerance	☐	☐	☐	☐
☐	☐	☐	☐	6. Drought tolerance	☐	☐	☐	☐
☐	☐	☐	☐	7. Heat tolerance	☐	☐	☐	☐
☐	☐	☐	☐	8. Temperament	☐	☐	☐	☐
☐	☐	☐	☐	9. Growth rate	☐	☐	☐	☐
☐	☐	☐	☐	10. Meat	☐	☐	☐	☐
☐	☐	☐	☐	11. Wool / hair	☐	☐	☐	☐
☐	☐	☐	☐	12. Fertility	☐	☐	☐	☐
☐	☐	☐	☐	13. Prolificacy	☐	☐	☐	☐
				Other (specify)				
☐	☐	☐	☐	14. _____	☐	☐	☐	☐

This form is also designed for a third pure breed. If there are fourth or fifth pure breeds add the information to this or previous sheets writing alongside the boxes for breed 1, 2 or 3.

BREED 3 Code ☐
(from list of breeds)

1. Common breed name _____

Local breed name _____

2. Trend within flock *(tick one)*

Increasing ☐ Decreasing ☐
Stable ☐ Unknown ☐

3. Numbers by age and sex
(enter X in box if not known)

	Lambs	Weaners	Adults
Intact male	☐	☐	☐
Castrate	☐	☐	☐
Female	☐	☐	☐

How old is the oldest animal? ☐ years

4. Origin/source of breed

1. Inherited ☐
2. Communal area farm ☐ * *specify location if known*
3. Commercial farm * ☐ _____
4. Market * ☐

5. Quality of traits perceived by owner
(Ask each question and for each trait tick one box, poor, average, good, no opinion)

MIXED CROSSES

1. Breeds apparently used to produce mixed crosses in flock *(rank up to four breeds in order of probable influence - use owner's knowledge if known)*

Rank Code

1. ☐ Common name _____ Local name _____
2. ☐ Common name _____ Local name _____
3. ☐ *Common name* _____ Local name _____
4. ☐ Common name _____ Local name _____

or unknown ☐

2. Numbers by age and sex
(enter X in box if not known)

	Lambs	Weaners	Adults
Intact male	☐	☐	☐
Castrate	☐	☐	☐
Female	☐	☐	☐

How old is the oldest animal? ☐ years

3. Quality of traits perceived by owner
(Ask each question and for each trait tick, one box, poor, average, good, no opinion)

Poor	Average	Good	No opinion/ not important		Poor	Average	Good	No opinion/ not important
☐	☐	☐	☐	1. Size	☐	☐	☐	☐
☐	☐	☐	☐	2. Conformation/shape	☐	☐	☐	☐
☐	☐	☐	☐	3. Colour	☐	☐	☐	☐
☐	☐	☐	☐	4. Horns	☐	☐	☐	☐
☐	☐	☐	☐	5. Disease tolerance	☐	☐	☐	☐
☐	☐	☐	☐	6. Drought tolerance	☐	☐	☐	☐
☐	☐	☐	☐	7. Heat tolerance	☐	☐	☐	☐
☐	☐	☐	☐	8. Temperament	☐	☐	☐	☐
☐	☐	☐	☐	9. Growth rate	☐	☐	☐	☐
☐	☐	☐	☐	10. Meat	☐	☐	☐	☐
☐	☐	☐	☐	11. Wool / hair	☐	☐	☐	☐
☐	☐	☐	☐	12. Fertility	☐	☐	☐	☐
☐	☐	☐	☐	13. Prolificacy	☐	☐	☐	☐

Other (specify)

☐	☐	☐	☐	14. _____	☐	☐	☐	☐

IF MORE THAN ONE PURE BREED SELECT ONE BREED.

1. Breed common name _____ Code ☐ *(from list of breeds)*

2. Coat description

Pattern *(1 or more ticks allowed)*: Uniform (1-colour) ☐; Uniform (multi-coloured) ☐; Pied ☐; Spotted ☐

Fibre type: Hair ☐; Course wool ☐; Fine wool ☐

Hair: Short ☐; Medium ☐; Long ☐; Straight ☐; Curly ☐

3. Colour *Enter number(s) from colour chart. Complete both halves of double box if animals have more than one colour, main colour first; first half only if uniform. Enter in order of frequency of colour combination in flock.*

	Rank			Rank			Rank			Rank	
Body	1.	☐☐	Head	1.	☐☐	Hoof	1.	☐☐	Muzzle	1.	☐☐
	2.	☐☐		2.	☐☐		2.	☐☐		2.	☐☐
	3.	☐☐		3.	☐☐		3.	☐☐			

4. Body Size

		Males	Females		Males	Females
Height	< 60 cm	☐	☐	Length < 60 cm	☐	☐
	< 70 cm	☐	☐	< 70 cm	☐	☐
	< 80 cm	☐	☐	< 80 cm	☐	☐
	> 80 cm	☐	☐	> 80 cm	☐	☐

5. Profile

Face *(1 or more ticks allowed)*: Flat ☐; Concave ☐; Convex ☐

Back: Hollow ☐; Straight ☐

Rump: Flat ☐; Sloping ☐; Roofy ☐

6. Throat ruff Present in all ☐; Present in some ☐; Absent ☐

7. Toggles Present in all ☐; Present in some ☐; Absent ☐

8. Horns

Present in all ☐; Present in some ☐; Absent ☐ (M ☐ F ☐)

Numbers: 2 (M ☐ F ☐); 4 (M ☐ F ☐)

Shape *(1 or more ticks allowed)*: Straight ☐; Curved ☐; Spiral ☐

Length: Rudimentory (<2 cm) ☐; Medium (2-8 cm) ☐; Long (>8 cm) ☐

Orientation *(1 or more ticks allowed)*: Upward ☐; Forward ☐; Backward ☐; Lateral ☐

9. Ears

Size: Rudimentory ☐; Medium ☐; Large ☐

Orientation: Erect ☐; Lateral ☐; Drooping ☐; Forward ☐

10. Tail

Base: Thick ☐; Thin ☐

Tapered: Yes ☐; No ☐

Curled: Yes ☐; No ☐

11. Wool ***Distribution*** Whole body ☐; Absent on belly ☐; Absent ☐

MANAGEMENT OF FARM ANIMAL GENETIC RESOURCES IN THE SADC REGION

SADC/UNDP/FAO PROJECT RAF/97/032
National Department of Agriculture
Private Bag XI38, Pretoria, South Africa
TEL: (27-12) 319-7424/7622; FAX: (27-12) 329-7220

ZIMBABWE FARM ANIMAL GENETIC RESOURCES SURVEY

QUESTIONNAIRE - GOATS

Enumerator Name _____ Code no. ☐ Date of interview / /

Supervisor Name _____ Code no. ☐

1. Province Name _____ Code no. ☐

2. District Name _____ Code no. ☐

3. Ward Name _____ Code no. ☐

4. Village (VIDCO) Name _____ Code no. ☐

5. Farm type Communal ☐ Small-scale commercial ☐ Large-scale commercial ☐

6. GPS reading _____ *(to be filled in later)* **7. Household** No ☐

8. Wealth category | rich | medium | poor | not classified | *(tick one)*

The overall objective of the survey, which is to be repeated in other SADC countries, is to obtain reliable estimates of population size and distribution of farm animal breed resources as well as to determine management/ production and socio-cultural practices employed by farmers in raising these animals. The surveys will enable simple, regular updating of breed information and facilitate updating of the databank on the FAO DAD-IS system. With this information, countries will be able to:

- develop comprehensive plans for the management of FAnGR,
- develop and harmonize support policies for FAnGR Management,
- facilitate development of appropriate animal recording systems and sustainable breeding programs,
- facilitate development and implementation of relevant conservation activities.

The activity is jointly funded by UNDP through the SADC FAnGR Program **(RAF/97/032)** and the Governments of Norway and Finland through the FAO Integrated Support to Sustainable Development and Food Security Program **(GCP/INT/694 NOR).**

The survey in Zimbabwe is being conducted by Matopos Research Station, in collaboration with the University of Zimbabwe and with the support of the International Livestock Research Institute.

1. Interviewee _____

Position in household
1. Household head ☐
2. Spouse of head ☐
3. Brother ☐
4. Sister ☐
5. Son ☐
6. Daughter ☐

Other (specify)

7. _____ ☐

2. Household head

Sex of head
Male ☐
Female ☐

Age (yrs)
≤ 30 ☐
31-40 ☐
41-50 ☐
51-60 ☐
61-70 ☐
> 70 ☐
Not known ☐

3. Tribe

Name _____

Code ☐

4. Number of people residing in household

Males ☐
Females ☐
Children < 15 yrs ☐

5. Land holding / farm size
(enter X in box in first column if not known)

	Area	Units *(tick)*	
Crops	☐	Acres	☐
Grazing *	☐	Hectares	☐
Forest	☐		

Total size ☐

* Other than communal

6. Land ownership
(Tick one or more)

Own ☐
Lease ☐
Other ☐ (specify) _____

7. Livestock activity

Is livestock the major activity on your farm?
Yes ☐ No ☐

8. Sources of income

(Tick first column as appropriate, rank level of source of income in second column – 1 highest.)

1. Crops	☐	☐
2. Livestock and products *	☐	☐
3. Home industries	☐	☐
4. Salary / wages	☐	☐

Other (specify)

5. _____ ☐ ☐

* Include the value of non-cash outputs or products e.g. manure, traction etc.

9. Livestock kept
(enter numbers in first column)

	Numbers	Most important species *(rank up to 3: (1, 2, 3)*
1. Cattle	☐	☐
2. Sheep	☐	☐
3. Goats	☐	☐
4. Chickens †	☐	☐
5. Pigs	☐	☐
6. Donkeys	☐	☐

Other (specify)

7. _____ ☐ ☐

† Adult birds only

10. Livestock production category
(Divide numbers given in question 9. into the following categories)

	Dairy	Meat	Dual purpose
1. Cattle	☐	☐	☐
2. Sheep	☐	☐	☐
3. Goats	☐	☐	☐

1. System of production *(Tick one or more)*

1. Industrial/intensive .. ☐
2. Semi-intensive ……. ☐
3. Extensive/pastoral … ☐
4. Free range / backyard ☐

Other (specify)

5. _____ ☐

2. Mobility *(Tick one or more)*

1. Sedentary ……. ☐
2. Transhumant … ☐
3. Nomadic …….. ☐

Other (specify)

4. _____ ☐

5. Purpose of keeping goats

Ask an open question and tick any purpose considered in first half of box - one or more boxes to be ticked. Then rank top three by writing in second half of a box 1 for primary purpose, 2 for second, 3 for third.

1. Meat ……..	☐	☐
2. Milk ……..	☐	☐
3. Stud breeding ……	☐	☐
4. Manure ……..	☐	☐
5. Blood ……..……	☐	☐
6. Skin ……..……..	☐	☐
7. Mohair……..……..	☐	☐
8. Cashere … …….	☐	☐
9. Cash from sales …	☐	☐
10. Investment …….	☐	☐
11. Dowry …..…….	☐	☐
12. Ceremonies ……..	☐	☐
13. Cultural …….	☐	☐

Others (specify)

14. _____ ☐ ☐

4. Members of household who own goats *(Tick one or more)*

Head ……... ☐
Spouse …… ☐
Head/spouse together … ☐
Sons ……... ☐
Daughters …….. ☐
Others * ……. ☐

* Describe _____

5. Members of household responsible for goat activities
(Tick as appropriate; more than one column in a row may be ticked)

	Adults Males	Adults Females	Boys (<15y)	Girls (<15y)	Hired labour
1. Purchasing goats ……	☐	☐	☐	☐	☐
2. Selling / slaughtering goats	☐	☐	☐	☐	☐
3. Herding ……...	☐	☐	☐	☐	☐
4. Breeding decisions ……	☐	☐	☐	☐	☐
5. Feeding …….	☐	☐	☐	☐	☐
6. Milking …….	☐	☐	☐	☐	☐
7. Making dairy products ….	☐	☐	☐	☐	☐
8. Selling dairy products …..	☐	☐	☐	☐	☐
9. Animal health ……	☐	☐	☐	☐	☐
Other (specify)					
10. _____	☐	☐	☐	☐	☐

6. Grazing/feeding

	Dry season	Wet season
1. Herded ……...	☐	☐
2. Paddock …….	☐	☐
3. Tethered ……	☐	☐
4. Stall ……	☐	☐
5. Yard ……...	☐	☐
6. Free grazing ..	☐	☐
Other (specify)		
7. _____	☐	☐

7. Housing

	Dry season	Wet season
1. Kraal …….	☐	☐
2. Stall/shed ..	☐	☐
3. Yard ……..	☐	☐
4. None …….	☐	☐
Other (specify)		
5. _____	☐	☐

If animals not housed go to question 10.

8. Materials used for housing
(Tick one or more)

1. Untreated wood/bush … ☐
2. Treated wood …… ☐
3. Iron sheets …… ☐
4. Bricks …….. ☐
5. Mud ……. ☐
6. Wire …….. ☐

Other (specify)

7. _____ ☐
8. _____ ☐

9. Form of housing
(Tick if present)

1. Roof ☐
2. Solid wall ☐
3. Floor
   a. concrete ☐
   b. wooden ☐
   c. earth ☐

10. Supplementation regime
(Tick as appropriate)

	Dry season	Wet season
1. Roughage/crop residue …….	☐	☐
2. Minerals (salts) / vitamins …	☐	☐
3. Bought-in feed / concentrates	☐	☐
4. None ……..	☐	☐
Other (specify)		
5. _____	☐	☐
6. _____	☐	☐

11. How goats are watered

	Dry season	Wet season
1. Animals go to water …….	☐	☐
2. Water is fetched/provided	☐	☐
3. Both …….	☐	☐

12. Source of water
(Tick one or more)

	Dry season	Wet season
1. Borehole ……	☐	☐
2. Dam/pond ……..	☐	☐
3. River ……..	☐	☐
4. Water well …….	☐	☐
5. Spring ……	☐	☐
6. Municipal/piped ……	☐	☐
Other (specify)		
6. _____	☐	☐

13. Distance to farthest watering point

	Dry season	Wet season
1. At household ……..	☐	☐
2. <1km ……..	☐	☐
3. 1-5 km ……	☐	☐
4. 6-10 km …….	☐	☐
5. >10 km ……...	☐	☐

14. Frequency of watering

	Dry season	Wet season
1. Freely available	☐	☐
2. Once a day ……	☐	☐
3. Twice a day …..	☐	☐
4. Every other day	☐	☐
5. Once in 3 days	☐	☐
Other (specify)		
6. _____	☐	☐

15. Water quality
(Tick one or more)

	Dry season	Wet season
1. Good/clear ……	☐	☐
2. Muddy ……..	☐	☐
3. Salty ……..	☐	☐
4. Smelly ……..	☐	☐

16. Flock management

Are goats run together with cattle? Yes ☐ No ☐

1. Access to veterinary services
(Tick as appropriate)

1. Government vet. ☐
2. Private vet. ☐
3. Veterinary drug supplier ☐
4. Extension service ☐
5. None ☐

Other (specify)

6. _____ ☐

2. Prevalent diseases that occur on farm
(i.e. diseases that are seen by farmer in his animals)

If none tick this box ☐

Local name or symptoms of disease *(Rank, most common first)*	Code *	Are animals treated when sick? Yes	No	Treatment given (if known)	Code *
1.					
2.					
3.					
4.					
5.					
6.					

**(codes to be entered later from lists of diseases and treatments)*

3. Vaccinations/preventive treatments given

If none tick this box ☐

Local name or symptoms of disease	Code *	Done routinely *(Tick as appropriate)*	Done when need arises
1.			
2.			
3.			
4.			
5.			
6.			

**(code to be entered later from list of diseases)*

4. Ectoparasite control

Method	(Tick)	Done when need arises: dry season	Done when need arises: wet season	Done routinely: dry season	Done routinely: wet season	If done routinely specify how often: dry season	If done routinely specify how often: wet season
1. None	☐						
2. Dip	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
3. Spray	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
4. Pour-on	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
5. Hand dressing	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
6. Injectables	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
7. Traditional	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

If traditional method specify _____ Code ☐ *(to be entered from list of traditional methods)*

Other (specify)

8. _____	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

5. Trypanosomosis control

Method	(Tick)	Done when need arises: dry season	Done when need arises: wet season	Done routinely: dry season	Done routinely: wet season	If done routinely specify how often: dry season	If done routinely specify how often: wet season
1. None (n/a)	☐						
2. Chemotherapy	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
3. Pour-on	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
4. Traditional	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

If traditional method specify _____ Code ☐

Other (specify)

5. _____	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

6. Intestinal parasite control

Method	(Tick)	Done when need arises: dry season	Done when need arises: wet season	Done routinely: dry season	Done routinely: wet season	If done routinely specify how often: dry season	If done routinely specify how often: wet season
1. None	☐						
2. Drench	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
3. Traditional	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

If traditional method specify _____ Code ☐

Other (specify)

4. _____	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

1. Castration

Do you castrate? Yes ☐
No ☐

If yes, say why. (*Tick one or more boxes)*

1. Control breeding ……... ☐
2. Improve meat quality ….. ☐
3. Better temperament ……. ☐

Other (specify)

4. _____ ☐

and at what age?

< 3 months ☐
3-6 months ☐
6-12 months ☐
> 12 months ☐

4. Sale outlet *(if sold in last 12 months)*

Were animals sold? Yes ☐ No ☐

If yes tick one or more boxes.

1. Sold at auction ☐
2. Sold to butcher ☐
3. Sold privately ☐
4. Sold to abattoir ☐

Other (specify)

5. _____ ☐

5. Exchange

Would goats ever be exchanged for cattle?
Yes ☐ No ☐

If yes, how many goats for a bull ☐ ,
cow ☐ , calf ☐ ?

2. Numbers of entries within last 12 months

For questions 2. and 3. first ask for information on kids and others (i.e. weaners and adults total). Then complete individual columns for weaners and adults if known. Enter X in a box if not known, 0 if answer is none.

		Weaners and Adults			
			Adults		Total
	Kids	Weaners	Males	Females	W + A
1. Born ……...	☐				
2. Bought ……...	☐	☐	☐	☐	☐
3. Donated/gift * …	☐	☐	☐	☐	☐
4. Exchanged/lent ..	☐	☐	☐	☐	☐

** to include bride price and dowry*

3. Numbers of exits within last 12 months

		Weaners and Adults			
		Adults			
	Kids	Weaners	Males	Females	Total W + A
1. Died …….	☐	☐	☐	☐	☐
2. Sold …….	☐	☐	☐	☐	☐
3. Slaughtered ….	☐	☐	☐	☐	☐
4. Donated/gift *	☐	☐	☐	☐	☐
5. Exchanged/lent	☐	☐	☐	☐	☐
6. Stolen ……..	☐	☐	☐	☐	☐

** to include bride price and dowry*

6. Reasons for culling / disposal

Ask as open question and tick any answers given in first *half of box, one or more boxes to be ticked. Then rank top three by writing in second half of box 1 for primary reason for culling, 2 for second and 3 for third.*

	Males	Females
1. Size ……	☐☐	☐☐
2. Conformation / shape ……	☐☐	☐☐
3. Colour ……	☐☐	☐☐
4. Temperament ……..	☐☐	☐☐
5. Health ……..	☐☐	☐☐
6. Body condition ……..	☐☐	☐☐
7. Performance ……..	☐☐	☐☐
8. Old age ……..	☐☐	☐☐
9. Poor fertility ……..	☐☐	☐☐

Other (specify)

10. _____	☐☐	☐☐
11. _____	☐☐	☐☐

1. Primary reason for keeping buck(s)
(Tick one)

1. Breeding …… ☐
2. Socio-cultural …… ☐

Other (specify)

3. _____ ☐

2. Reasons for choice of buck(s) for breeding
If breeding not done proceed to next page.

Ask an open question and tick any reason for choice
considered in first half of box, one or more boxes to be ticked. Then rank top three by writing in second half of box 1 for primary reason for choice, 2 for second and 3 for third.

1. Size ……. ☐☐
2. Conformation/shape …….. ☐☐
3. Colour ……. ☐☐
4. Horns …….. ☐☐
5. Temperament …….. ☐☐
6. Performance …… ☐☐
7. Availability (no choice) …….. ☐☐

Other (specify)

8. _____ ☐☐

3. Mating

(Tick one or more boxes)

1. Uncontrolled ☐
2. Hand mating ☐
3. Group mating ☐
4. A.I. ☐

Other (specify)

5. _____ ☐

4. Prolificacy

Consider the kids currently in your flock.

From how many does were they born? ☐

How many of these does had

singletons ☐
twins ☐
triplets ☐

5. Source and breed(s) of buck(s) used in the herd

Breed name(s) *(specify if known – crosses can be included.)*

Tick one or more boxes		**Breed type 1 Common name**	Code*		**Breed type 2 Common name**	Code*	
1. Own buck (bred) ….	☐	_____	☐	☐	_____	☐	☐
2. Own buck (bought)	☐	_____	☐	☐	_____	☐	☐
3. Buck donated ……..	☐	_____	☐	☐	_____	☐	☐
4. Buck borrowed ……	☐	_____	☐	☐	_____	☐	☐
5. Communal area buck	☐	_____	☐	☐	_____	☐	☐
6. A.I.	☐	_____	☐	☐	_____	☐	☐

**(code to be entered from list of breeds – use first box only if pure breed, two boxes if buck is a crossed breed)*

Number of pure breeds * | 0 | 1 | 2 | 3 | 4 | 5 | *(tick)*

** If crossing of two breeds has resulted in a genotype that is recognised and maintained as a breed, then count this as a separate breed and include it on this form. If no pure breeds tick 0 in box and complete section on mixed crosses form. If more than two pure breeds, third breed can be entered on mixed crosses form.*

BREED 1 Code ☐ *(from list of breeds)*

1. Common breed name _____

Local breed name _____

2. Trend within herd *(tick one)*

Increasing ☐ Decreasing ☐
Stable ☐ Unknown ☐

3. Numbers by age and sex
(enter X in box if not known)

	Kids	Weaners	Adults
Intact male	☐	☐	☐
Castrate	☐	☐	☐
Female	☐	☐	☐

How old is the oldest animal? ☐ years

4. Origin/source of breed

1. Inherited ☐
2. Communal area farm ☐ * *specify location if known*
3. Commercial farm * ☐ _____
4. Market * ☐

5. Quality of traits perceived by owner
(Ask each question and for each trait tick, one box poor, average, good, no opinion)

BREED 2 Code ☐ *(from list of breeds)*

1. Common breed name _____

Local breed name _____

2. Trend within herd *(tick one)*

Increasing ☐ Decreasing ☐
Stable ☐ Unknown ☐

3. Numbers by age and sex
(enter X in box if not known)

	Kids	Weaners	Adults
Intact male	☐	☐	☐
Castrate	☐	☐	☐
Female	☐	☐	☐

How old is the oldest animal? ☐ years

4. Origin/source of breed

1. Inherited ☐
2. Communal area farm ☐ * *specify location if known*
3. Commercial farm * ☐ _____
4. Market * ☐

5. Quality of traits perceived by owner
(Ask each question and for each trait tick one box , poor, average, good, no opinion)

Poor	Average	Good	No opinion/ not important		Poor	Average	Good	No opinion/ not important
☐	☐	☐	☐	1. Size	☐	☐	☐	☐
☐	☐	☐	☐	2. Conformation/shape	☐	☐	☐	☐
☐	☐	☐	☐	3. Colour	☐	☐	☐	☐
☐	☐	☐	☐	4. Horns	☐	☐	☐	☐
☐	☐	☐	☐	5. Disease tolerance	☐	☐	☐	☐
☐	☐	☐	☐	6. Drought tolerance	☐	☐	☐	☐
☐	☐	☐	☐	7. Heat tolerance	☐	☐	☐	☐
☐	☐	☐	☐	8. Temperament	☐	☐	☐	☐
☐	☐	☐	☐	9. Growth rate	☐	☐	☐	☐
☐	☐	☐	☐	10. Milk yield	☐	☐	☐	☐
☐	☐	☐	☐	11. Meat	☐	☐	☐	☐
☐	☐	☐	☐	12. Hair	☐	☐	☐	☐
☐	☐	☐	☐	13. Fertility	☐	☐	☐	☐
☐	☐	☐	☐	14. Prolificacy	☐	☐	☐	☐

Other (specify)

☐	☐	☐	☐	15. _____	☐	☐	☐	☐

This form is also designed for a third pure breed. If there are fourth or fifth pure breeds add the information to this or previous sheets writing alongside the boxes for breed 1, 2 or 3.

BREED 3 Code ☐
(from list of breeds)

1. Common breed name _____

Local breed name _____

2. Trend within herd *(tick one)*

Increasing ☐ Decreasing ☐
Stable ☐ Unknown ☐

3. Numbers by age and sex
(enter X in box if not known)

	Kids	Weaners	Adults
Intact male	☐	☐	☐
Castrate	☐	☐	☐
Female	☐	☐	☐

How old is the oldest animal? ☐ years

4. Origin/source of breed

1. Inherited ☐
2. Communal area farm ☐
3. Commercial farm * ☐
4. Market * ☐

* *specify location if known* _____

5. Quality of traits perceived by owner
(Ask each question and for each trait tick one box, poor, average, good, no opinion)

Poor	Average	Good	No opinion/ not important	
☐	☐	☐	☐	1. Size
☐	☐	☐	☐	2. Conformation/shape
☐	☐	☐	☐	3. Colour
☐	☐	☐	☐	4. Horns
☐	☐	☐	☐	5. Disease tolerance
☐	☐	☐	☐	6. Drought tolerance
☐	☐	☐	☐	7. Heat tolerance
☐	☐	☐	☐	8. Temperament
☐	☐	☐	☐	9. Growth rate
☐	☐	☐	☐	10. Milk yield
☐	☐	☐	☐	11. Meat
☐	☐	☐	☐	12. Hair
☐	☐	☐	☐	13. Fertility
☐	☐	☐	☐	14. Prolificacy
				Other (specify)
☐	☐	☐	☐	15. _____

MIXED CROSSES

1. Breeds apparently used to produce mixed crosses in herd *(rank up to four breeds in order of probable* influence - use owner's knowledge if known)

Rank	*Code*	
1.	☐	Common name _____ Local name _____
2.	☐	Common name _____ Local name _____
3.	☐	Common name _____ Local name _____
4.	☐	Common name _____ Local name _____

or unknown ☐

2. Numbers by age and sex
(enter X in box if not known)

	Kids	Weaners	Adults
Intact male	☐	☐	☐
Castrate	☐	☐	☐
Female	☐	☐	☐

How old is the oldest animal? ☐ years

3. Quality of traits perceived by owner
(Ask each question and for each trait tick one box, poor, average, good, no opinion)

Poor	Average	Good	No opinion/ not important	
☐	☐	☐	☐	1. Size
☐	☐	☐	☐	2. Conformation/shape
☐	☐	☐	☐	3. Colour
☐	☐	☐	☐	4. Horns
☐	☐	☐	☐	5. Disease tolerance
☐	☐	☐	☐	6. Drought tolerance
☐	☐	☐	☐	7. Heat tolerance
☐	☐	☐	☐	8. Temperament
☐	☐	☐	☐	9. Growth rate
☐	☐	☐	☐	10. Milk yield
☐	☐	☐	☐	11. Meat
☐	☐	☐	☐	12. Hair
☐	☐	☐	☐	13. Fertility
☐	☐	☐	☐	14. Prolificacy
				Other (specify)
☐	☐	☐	☐	15. _____

IF MORE THAN ONE PURE BREED SELECT ONE BREED.

1. Breed common name _____ Code ☐☐ *(from list of breeds)*

2. Coat description

Pattern *(1 or more ticks allowed)*: Uniform (1-colour) ☐; Uniform (multi-coloured) ☐; Pied ☐; Spotted ☐

Fibre type: Hair ☐; Course wool ☐; Fine wool ☐

Hair: Short ☐; Medium ☐; Long ☐; Straight ☐; Curly ☐

3. Colour *Enter number(s) from colour chart. Complete both halves of double box if animals have more than one colour, main colour first; first half only if uniform. Enter in order of frequency of colour combination in flock.*

	Rank		Rank		Rank		Rank	
	Body	Head		Hoof		Muzzle		
1.	☐☐	☐☐		☐☐		☐☐		
2.	☐☐	☐☐		☐☐		☐☐		
3.	☐☐	☐☐		☐☐				

4. Body Size

		Males	Females			Males	Females
Height	< 50 cm	☐	☐	Length	< 50 cm	☐	☐
	< 65 cm	☐	☐		< 65 cm	☐	☐
	< 80 cm	☐	☐		< 80 cm	☐	☐
	> 80 cm	☐	☐		> 80 cm	☐	☐

5. Profile

Face *(1 or more ticks allowed)*: Flat ☐; Concave ☐; Convex ☐

Back: Hollow ☐; Straight ☐

Rump: Flat ☐; Sloping ☐; Roofy ☐

6. Beard: Present in all ☐; Present in some ☐; Absent ☐

7. Toggles: Present in all ☐; Present in some ☐; Absent ☐

8. Horns

	M	F	Numbers	M	F	Shape *(1 or more ticks allowed)*	
Present in all	☐	☐	2	☐	☐	Straight	☐
Present in some	☐	☐	4	☐	☐	Curved	☐
Absent	☐	☐				Spiral	☐

Length: Rudimentory (<2 cm) ☐; Medium (2-8 cm) ☐; Long (>8 cm) ☐

Orientation *(1 or more ticks allowed)*: Upward ☐; Forward ☐; Backward ☐; Lateral ☐

9. Ears

Size: Rudimentory ☐; Medium ☐; Large ☐

Orientation: Erect ☐; Lateral ☐; Drooping ☐; Forward ☐

10. Long hair on legs: Present in all ☐; Present in some ☐; Absent ☐

MANAGEMENT OF FARM ANIMAL GENETIC RESOURCES IN THE SADC REGION

SADC/UNDP/FAO PROJECT RAF/97/032
National Department of Agriculture
Private Bag XI38, Pretoria, South Africa
TEL: (27-12) 319-7424/7622; FAX: (27-12) 329-7220

ZIMBABWE FARM ANIMAL GENETIC RESOURCES SURVEY

QUESTIONNAIRE – PIGS

Enumerator Name _____ Code no. ☐ Date of interview / /

Supervisor Name _____ Code no. ☐

1. Province Name _____ Code no. ☐

2. District Name _____ Code no. ☐

3. Ward Name _____ Code no. ☐

4. Village (VIDCO) Name _____ Code no. ☐

5. Farm type Communal ☐ Small-scale commercial ☐ Large-scale commercial ☐

6. GPS reading _____ *(to be filled in later)* **7. Household** No ☐

8. Wealth category | rich | medium | poor | not classified | *(tick one)*

The overall objective of the survey, which is to be repeated in other SADC countries, is to obtain reliable estimates of population size and distribution of farm animal breed resources as well as to determine management/ production and socio-cultural practices employed by farmers in raising these animals. The surveys will enable simple, regular updating of breed information and facilitate updating of the databank on the FAO DAD-IS system. With this information, countries will be able to:

- develop comprehensive plans for the management of FAnGR,
- develop and harmonize support policies for FAnGR Management,
- facilitate development of appropriate animal recording systems and sustainable breeding programs,
- facilitate development and implementation of relevant conservation activities.

The activity is jointly funded by UNDP through the SADC FAnGR Program (**RAF/97/032)** and the Governments of Norway and Finland through the FAO Integrated Support to Sustainable Development and Food Security Program (**GCP/INT/694 NOR).**

The survey in Zimbabwe is being conducted by Matopos Research Station, in collaboration with the University of Zimbabwe and with the support of the International Livestock Research Institute.

1. Interviewee _____

Position in household
1. Household head ☐
2. Spouse of head ☐
3. Brother ☐
4. Sister ☐
5. Son ☐
6. Daughter ☐

Other (specify)

7. _____ ☐

2. Household head

Sex of head
Male ☐
Female ☐

Age (yrs)
≤ 30 ☐
31-40 ☐
41-50 ☐
51-60 ☐
61-70 ☐
> 70 ☐
Not known ☐

3. Tribe

Name _____

Code ☐

4. Number of people residing in household

Males ☐
Females ☐
Children < 15 yrs ☐

5. Land holding / farm size
(enter X in box in first column if not known)

	Area	Units *(tick)*	
Crops	☐	Acres	☐
Grazing *	☐	Hectares	☐
Forest	☐		

Total size ☐

* Other than communal

6. Land ownership
(Tick one or more)

Own ☐
Lease ☐
Other ☐ (specify) _____

7. Livestock activity

Is livestock the major activity on your farm?
Yes ☐ No ☐

8. Sources of income

(Tick first column as appropriate, rank level of source of income in second column – 1 highest.)

1. Crops	☐	☐
2. Livestock and products *	☐	☐
3. Home industries	☐	☐
4. Salary / wages	☐	☐

Other (specify)

5. _____ ☐ ☐

* Include the value of non-cash outputs or products e.g. manure, traction etc.

9. Livestock kept
(enter numbers in first column)

	Numbers	Most important species *(rank up to 3: (1, 2, 3)*
1. Cattle	☐	☐
2. Sheep	☐	☐
3. Goats	☐	☐
4. Chickens †	☐	☐
5. Pigs	☐	☐
6. Donkeys	☐	☐

Other (specify)

7. _____ ☐ ☐

† Adult birds only

10. Livestock production category
(Divide numbers given in question 9. into the following categories)

	Dairy	Meat	Dual purpose
1. Cattle	☐	☐	☐
2. Sheep	☐	☐	☐
3. Goats	☐	☐	☐

1. System of production

(Tick one or more)

1. Industrial/intensive .. ☐
2. Semi-intensive ……. ☐
3. Extensive/pastoral … ☐
4. Free range / backyard ☐

Other (specify)

5. _____ ☐

- **Purpose of keeping pigs**

Ask an open question and tick any purpose considered in first half of box-one or more boxes to be ticked. Then rank top three by writing in second half of a box 1 for primary purpose, 2 for second, 3 for third.

1. Meat …… ☐☐
2. Stud breeding ……. ☐☐
3. Manure ……..…….. ☐☐
4. Fat …… ☐☐
5. Cash from sales …. ☐☐
6. Investment ……. ☐☐
7. Dowry ……..…… ☐☐
8. Ceremonies ……. ☐☐
9. Cultural ……..……. ☐☐

Other (specify)

10. _____ ☐☐

3. Members of household who own pigs *(Tick one or more)*

Head …….. ☐
Spouse …… ☐
Head/spouse together ☐
Sons …… ☐
Daughters …….. ☐
Others * ……. ☐

* Describe _____

4. Members of household responsible for pig activities
(Tick as appropriate; more than one column in a row may be ticked)

	Adults Males	Adults Females	Boys (<15y)	Girls (<15y)	Hired labour
1. Purchasing pigs …….	☐	☐	☐	☐	☐
2. Selling / slaughtering pigs	☐	☐	☐	☐	☐
3. Herding ……..	☐	☐	☐	☐	☐
4. Breeding decisions …….	☐	☐	☐	☐	☐
5. Feeding ……..	☐	☐	☐	☐	☐
6. Animal health ……	☐	☐	☐	☐	☐
Other (specify)					
7. _____	☐	☐	☐	☐	☐

5. Grazing/feeding

	Dry season	Wet season
1. Paddock …….	☐	☐
2. Tethered ……	☐	☐
3. Stall ……	☐	☐
4. Yard ……	☐	☐
5. Free grazing	☐	☐
Other (specify)		
6. _____	☐	☐

6. Housing

	Dry season	Wet season
1. Kraal …….	☐	☐
2. Stall/shed ..	☐	☐
3. Yard ……..	☐	☐
4. None …….	☐	☐
Other (specify)		
5. _____	☐	☐

If animals not housed go to question 10.

7. Materials used for housing
(Tick one or more)

1. Untreated wood/bush … ☐
2. Treated wood …… ☐
3. Iron sheets …… ☐
4. Bricks …….. ☐
5. Mud ……. ☐
6. Wire …….. ☐

Other (specify)

7. _____ ☐
8. _____ ☐

8. Form of housing
(Tick if present)

1. Roof ☐
2. Solid wall ☐
3. Floor
   a. concrete ☐
   b. wooden ☐
   c. earth ☐

9. Supplementation regime
(Tick as appropriate)

	Dry season	Wet season
1. Kitchen waste ……	☐	☐
2. Minerals (salts) / vitamins ….	☐	☐
3. Bought-in feed / concentrates	☐	☐
4. None ……..	☐	☐
Other (specify)		
5. _____	☐	☐
6. _____	☐	☐

10. How pigs are watered

	Dry season	Wet season
1. Animals go to water …….	☐	☐
2. Water is fetched/provided	☐	☐
3. Both ……..	☐	☐

11. Source of water
(Tick one or more)

	Dry season	Wet season
1. Borehole ……	☐	☐
2. Dam/pond ……..	☐	☐
3. River …….	☐	☐
4. Water well ……	☐	☐
5. Spring ……	☐	☐
6. Municipal/piped ……	☐	☐
Other (specify)		
7. _____	☐	☐

12. Distance to farthest watering point

	Dry season	Wet season
1. At household ……..	☐	☐
2. <1km ……..	☐	☐
3. 1-5 km ……	☐	☐
4. 6-10 km ……..	☐	☐

13. Frequency of watering

	Dry season	Wet season
1. Freely available	☐	☐
2. Once a day ……	☐	☐
3. Twice a day …..	☐	☐
4. Every other day	☐	☐
5. Once in 3 days	☐	☐
Other (specify)		
6. _____	☐	☐

14. Water quality
(Tick one or more)

	Dry season	Wet season
1. Good/clear ……	☐	☐
2. Muddy ……	☐	☐
3. Salty ……..	☐	☐
4. Smelly ……	☐	☐

1. Access to veterinary services
(Tick as appropriate)

1. Government vet. ☐
2. Private vet. ☐
3. Veterinary drug supplier ☐
4. Extension service ☐
5. None ☐

Other (specify)

6. _____ ☐

2. Prevalent diseases that occur on farm
(i.e. diseases that are seen by farmer in his animals)

If none tick this box ☐

Local name or symptoms of disease *(Rank, most common first)*	Code *	Are animals treated when sick? Yes	No	Treatment given (if known)	Code *
1.					
2.					
3.					
4.					
5.					
6.					

**(codes to be entered later from lists of diseases and treatments)*

3. Vaccinations/preventive treatments given

If none tick this box ☐

Local name or symptoms of disease	Code *	Done routinely *(Tick as appropriate)*	Done when need arises
1.			
2.			
3.			
4.			
5.			
6.			

**(code to be entered later from list of diseases)*

4. Ectoparasite control

Method	(Tick)	Done when need arises: dry season	Done when need arises: wet season	Done routinely: dry season	Done routinely: wet season	If done routinely specify how often: dry season	If done routinely specify how often: wet season
1. None	☐						
2. Dip	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
3. Spray	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
4. Pour-on	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
5. Hand dressing	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
6. Injectables	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
7. Traditional	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

If traditional method specify _____ Code ☐ *(to be entered from list of traditional methods)*

Other (specify)

8. _____ ☐ ☐ ☐ ☐ ☐ every ☐ weeks every ☐ weeks

5. Trypanosomosis control

Method	(Tick)	Done when need arises: dry season	Done when need arises: wet season	Done routinely: dry season	Done routinely: wet season	If done routinely specify how often: dry season	If done routinely specify how often: wet season
1. None (n/a)	☐						
2. Chemotherapy	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
3. Pour-on	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
4. Traditional	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

If traditional method specify _____ Code ☐

Other (specify)

5. _____ ☐ ☐ ☐ ☐ ☐ every ☐ weeks every ☐ weeks

6. Intestinal parasite control

Method	(Tick)	Done when need arises: dry season	Done when need arises: wet season	Done routinely: dry season	Done routinely: wet season	If done routinely specify how often: dry season	If done routinely specify how often: wet season
1. None	☐						
2. Drench	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
3. Traditional	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

If traditional method specify _____ Code ☐

Other (specify)

4. _____ ☐ ☐ ☐ ☐ ☐ every ☐ weeks every ☐ weeks

1. Castration

Do you castrate? Yes ☐
No ☐

If yes, say why. (*Tick one or more boxes)*

1. Control breeding …….. ☐
2. Improve meat quality ….. ☐
3. Better temperament ……. ☐

Other (specify) ☐

4. _____

and at what age? ☐

< 3 months ☐
3-6 months ☐
6-12 months ☐
> 12 months ☐

4. Sale outlet *(if sold in last 12 months)*

Were animals sold? Yes ☐ No ☐

If yes tick one or more boxes.

1. Sold at auction ☐
2. Sold to butcher ☐
3. Sold privately ☐
4. Sold to abattoir ☐

Other (specify)

5. _____ ☐

2. Numbers of entries within last 12 months

For questions 2. and 3. first ask for information on piglets and others (i.e. weaners and adults total). Then complete individual columns for weaners and adults if known. Enter X in a box if not known, 0 if answer is none.

		Weaners and Adults			
			Adults		Total
	Piglets	Weaners	Males	Females	W + A
1. Born ……..	☐				
2. Bought ……	☐	☐	☐	☐	☐
3. Donated/gift * ..	☐	☐	☐	☐	☐
4. Exchanged/lent	☐	☐	☐	☐	☐

** to include bride price and dowry*

3. Numbers of exits within last 12 months

		Weaners and Adults			
			Adults		
	Piglets	Weaners	Males	Females	Total W + A
1. Died …….	☐	☐	☐	☐	☐
2. Sold ……..	☐	☐	☐	☐	☐
3. Slaughtered …..	☐	☐	☐	☐	☐
4. Donated/gift *	☐	☐	☐	☐	☐
5. Exchanged/lent	☐	☐	☐	☐	☐
6. Stolen ……..	☐	☐	☐	☐	☐

** to include bride price and dowry*

5. Reasons for culling / disposal

Ask as open question and tick any answers given in first *half of box, one or more boxes to be ticked. Then rank top three by writing in second half of box 1 for primary reason for culling, 2 for second and 3 for third.*

	Males	Females
1. Size ……	☐☐	☐☐
2. Conformation / shape ……	☐☐	☐☐
3. Temperament …….	☐☐	☐☐
4. Health …….	☐☐	☐☐
5. Body condition ……..	☐☐	☐☐
6. Performance ……	☐☐	☐☐
7. Old age ……	☐☐	☐☐
8. Poor fertility ……	☐☐	☐☐
	☐☐	☐☐

Other (specify)

9. _____
10. _____ ☐☐ ☐☐

1. Primary reason for keeping boar(s)
(Tick one)

1. Breeding …… ☐
2. Socio-cultural …… ☐
3. Fattening …… ☐

Other (specify)

4. _____ ☐

2. Reasons for choice of boar(s) for breeding
If breeding not done proceed to next page.

Ask an open question and tick any reason for choice considered in first half of box, one or more boxes to be ticked. Then rank top three by writing in second half of box 1 for primary reason for choice, 2 for second and 3 for third.

1. Size ……. ☐☐
2. Conformation/shape …… ☐☐
3. Colour ……. ☐☐
4. Temperament …….. ☐☐
5. Performance …… ☐☐
6. Availability (no choice) …… ☐☐

Other (specify)

7. _____ ☐☐

3. Mating

(Tick one or more boxes)

1. Uncontrolled …. ☐
2. Hand mating …. ☐
3. Group mating … ☐

Other (specify)

4. _____ ☐

4. Prolificacy

Average no. of piglets per litter ☐

5. Farrowing interval ☐ months.

4. Source and breed(s) of boar(s) used in the herd

Breed name(s) *(specify if known – crosses can be included.)*

Tick one or more boxes		**Breed type 1 Common name**	Code*		**Breed type 2 Common name**	Code*	
1. Own boar (bred) …..	☐	_____	☐	☐	_____	☐	☐
2. Own boar (bought)	☐	_____	☐	☐	_____	☐	☐
3. Boar donated ……..	☐	_____	☐	☐	_____	☐	☐
4. Boar borrowed ……	☐	_____	☐	☐	_____	☐	☐
5. Unknown boar ……	☐	_____	☐	☐	_____	☐	☐

**(code to be entered from list of breeds – use first box only if pure breed, two boxes if boar is a crossed breed)*

Number of pure breeds * | 0 | 1 | 2 | 3 | 4 | 5 | *(tick)*

**If crossing of two breeds has resulted in a genotype that is recognised and maintained as a breed, then count this as a separate breed and include it on this form. If no pure breeds tick 0 in box and complete section on mixed crosses form. If more than two pure breeds, third breed can be entered on mixed crosses form.*

BREED 1 Code ☐ *(from list of breeds)*

1. Common breed name _____

Local breed name _____

2. Trend within herd *(tick one)*

Increasing ☐ Decreasing ☐
Stable ☐ Unknown ☐

3. Numbers by age and sex
(enter X in box if not known)

	Piglets	Weaners	Adults
	☐		
Intact male		☐	☐
Castrate		☐	☐
Female		☐	☐

How old is the oldest animal? ☐ Years

4. Origin/source of breed

1. Inherited ☐
2. Communal area farm ☐ * *specify location if known*
3. Commercial farm * ☐ _____
4. Market * ☐

5. Quality of traits perceived by owner
(Ask each question and for each trait tick one box poor, average, good, no opinion)

Poor	Average	Good	No opinion/ not important	
☐	☐	☐	☐	1. Size
☐	☐	☐	☐	2. Conformation/shape
☐	☐	☐	☐	3. Colour
☐	☐	☐	☐	4. Disease tolerance
☐	☐	☐	☐	5. Drought tolerance
☐	☐	☐	☐	6. Heat tolerance
☐	☐	☐	☐	7. Temperament
☐	☐	☐	☐	8. Growth rate
☐	☐	☐	☐	9. Meat
☐	☐	☐	☐	10. Fertility
☐	☐	☐	☐	11. Litter size

Other (specify)

☐ ☐ ☐ ☐ 12. _____

BREED 2 Code ☐ *(from list of breeds)*

1. Common breed name _____

Local breed name _____

2. Trend within herd *(tick one)*

Increasing ☐ Decreasing ☐
Stable ☐ Unknown ☐

3. Numbers by age and sex
(enter X in box if not known)

	Piglets	Weaners	Adults
	☐		
Intact male		☐	☐
Castrate		☐	☐
Female		☐	☐

How old is the oldest animal? ☐ Years

4. Origin/source of breed

1. Inherited ☐
2. Communal area farm ☐ * *specify location if known*
3. Commercial farm * ☐ _____
4. Market * ☐

5. Quality of traits perceived by owner
(Ask each question and for each trait tick one box , poor, average, good, no opinion)

Poor	Average	Good	No opinion/ not important	
☐	☐	☐	☐	1. Size
☐	☐	☐	☐	2. Conformation/shape
☐	☐	☐	☐	3. Colour
☐	☐	☐	☐	4. Disease tolerance
☐	☐	☐	☐	5. Drought tolerance
☐	☐	☐	☐	6. Heat tolerance
☐	☐	☐	☐	7. Temperament
☐	☐	☐	☐	8. Growth rate
☐	☐	☐	☐	9. Meat
☐	☐	☐	☐	10. Fertility
☐	☐	☐	☐	11. Litter size

Other (specify)

☐ ☐ ☐ ☐ 12. _____

This form is also designed for a third pure breed. If there are fourth or fifth pure breeds add the information to this or previous sheets writing alongside the boxes for breed 1, 2 or 3.

BREED 3 Code ☐
(from list of breeds)

1. Common breed name _____

Local breed name _____

2. Trend within herd *(tick one)*

Increasing ☐ Decreasing ☐
Stable ☐ Unknown ☐

3. Numbers by age and sex
(enter X in box if not known)

	Piglets	Weaners	Adults
	☐		
Intact male		☐	☐
Castrate male		☐	☐
Female		☐	☐

How old is the oldest animal? ☐ years

4. Origin/source of breed

1. Inherited ☐
2. Communal area farm ☐
3. Commercial farm * ☐
4. Market * ☐

* *specify location if known* _____

5. Quality of traits perceived by owner
(Ask each question and for each trait tick, one box poor, average, good, no opinion)

Poor	Average	Good	No opinion/ not important		Poor	Average	Good	No opinion/ not important
☐	☐	☐	☐	…… 1. Size ……..…	☐	☐	☐	☐
☐	☐	☐	☐	…… 2. Conformation/shape ……	☐	☐	☐	☐
☐	☐	☐	☐	…… 3. Colour ……..	☐	☐	☐	☐
☐	☐	☐	☐	…… 4. Disease tolerance …….	☐	☐	☐	☐
☐	☐	☐	☐	…… 5. Drought tolerance ……	☐	☐	☐	☐
☐	☐	☐	☐	…… 6. Heat tolerance ……..	☐	☐	☐	☐
☐	☐	☐	☐	…… 7. Temperament ……..	☐	☐	☐	☐
☐	☐	☐	☐	…… 8. Growth rate ……..	☐	☐	☐	☐
☐	☐	☐	☐	……... 9. Meat …….	☐	☐	☐	☐
☐	☐	☐	☐	…….. 10. Fertility ……	☐	☐	☐	☐
☐	☐	☐	☐	…….. 11. Litter size …….	☐	☐	☐	☐
				Other (specify)				
☐	☐	☐	☐	…….. 12. _____	☐	☐	☐	☐

MIXED CROSSES

1. Breeds apparently used to produce mixed crosses in herd *(rank up to four breeds in order of probable* influence - use owner's knowledge if known)

Rank	*Code*	
1.	☐	Common name _____ Local name _____
2.	☐	Common name _____ Local name _____
3.	☐	Common name _____ Local name _____
4.	☐	Common name _____ Local name _____

or unknown ☐

2. Numbers by age and sex
(enter X in box if not known)

	Piglets	Weaners	Adults
	☐		
Intact male		☐	☐
Castrate male		☐	☐
Female		☐	☐

How old is the oldest animal? ☐ years

3. Quality of traits perceived by owner
(Ask each question and for each trait tick one box, poor, average, good, no opinion)

Poor Average Good No opinion/ not important
1. Size
2. Conformation/shape
3. Colour
4. Disease tolerance
5. Drought tolerance
6. Heat tolerance
7. Temperament
8. Growth rate
9. Meat
10. Fertility
11. Litter size
Other (specify)
12. _____

IF MORE THAN ONE PURE BREED SELECT ONE BREED.

1. Breed common name _____ **Code** ☐ *(from list of breeds)*

2. Coat description

Pattern *(1 or more ticks allowed)*	Uniform 1-colour ☐	Hair	Short ☐	Straight ☐
	Uniform 2-colours ☐		Medium ☐	Curly ☐
	Pied ☐		Long ☐	
	Spotted ☐			

3. Coat Colour *Enter number(s) from colour chart. Complete both halves of double box if animals have more than one colour, main colour first; first half only if uniform. Rank in order of frequency of colour combination in herd.*

	Rank				*Rank*	
Body	1.	☐	☐	Hoof	1.	☐ ☐
	2.	☐	☐		2.	☐ ☐
	3.	☐	☐		3.	☐ ☐

4. Body Size

		M	F			M	F
Height	Small	☐	☐	Length	Small	☐	☐
	Medium	☐	☐		Medium	☐	☐
	Large	☐	☐		Large	☐	☐

5. Profile

Face	Flat ☐	Back	Hollow ☐	Rump	Flat ☐	Shape	Pot-belly ☐
	Concave ☐		Straight ☐		Sloping ☐		Lean ☐
					Roofy ☐		

6. Head

				M	F
Snout	Short ☐	Tusks	Present	☐	☐
	Medium ☐		Absent	☐	☐
	Long ☐				

7. Ears

Size	Rudimentory ☐	Orientation	Erect ☐
	Medium ☐		Lateral ☐
	Large ☐		Drooping ☐

8. Tail

Length	Short ☐	Presentation	Curled ☐
	Medium ☐		Straight ☐
	Long ☐		

9. Hair on legs Present ☐ Absent ☐

MANAGEMENT OF FARM ANIMAL GENETIC RESOURCES IN THE SADC REGION

SADC/UNDP/FAO PROJECT RAF/97/032
National Department of Agriculture
Private Bag XI38, Pretoria, South Africa
TEL: (27-12) 319-7424/7622; FAX: (27-12) 329-7220

ZIMBABWE FARM ANIMAL GENETIC RESOURCES SURVEY

QUESTIONNAIRE – CHICKENS

Enumerator Name _____ Code no. ☐ Date of interview / /

Supervisor Name _____ Code no. ☐

1. Province Name _____ Code no. ☐

2. District Name _____ Code no. ☐

3. Ward Name _____ Code no. ☐

4. Village (VIDCO) Name _____ Code no. ☐

5. Farm type Communal ☐ Small-scale commercial ☐ Large-scale commercial ☐

6. GPS reading _____ *(to be filled in later)* **7. Household** No ☐

8. Wealth category | rich | medium | poor | not classified | *(tick one)*

The overall objective of the survey, which is to be repeated in other SADC countries, is to obtain reliable estimates of population size and distribution of farm animal breed resources as well as to determine management/ production and socio-cultural practices employed by farmers in raising these animals. The surveys will enable simple, regular updating of breed information and facilitate updating of the databank on the FAO DAD-IS system. With this information, countries will be able to:

- develop comprehensive plans for the management of FAnGR,
- develop and harmonize support policies for FAnGR Management,
- facilitate development of appropriate animal recording systems and sustainable breeding programs,
- facilitate development and implementation of relevant conservation activities.

The activity is jointly funded by UNDP through the SADC FAnGR Program (**RAF/97/032)** and the Governments of Norway and Finland through the FAO Integrated Support to Sustainable Development and Food Security Program (**GCP/INT/694 NOR).**

The survey in Zimbabwe is being conducted by Matopos Research Station, in collaboration with the University of Zimbabwe and with the support of the International Livestock Research Institute.

1. Interviewee _____

Position in household
1. Household head ☐
2. Spouse of head ☐
3. Brother ☐
4. Sister ☐
5. Son ☐
6. Daughter ☐

Other (specify)

7. _____ ☐

2. Household head

Sex of head
Male ☐
Female ☐

Age (yrs)
≤ 30 ☐
31-40 ☐
41-50 ☐
51-60 ☐
61-70 ☐
> 70 ☐
Not known ☐

3. Tribe

Name _____

Code ☐

4. Number of people residing in household

Males ☐
Females ☐
Children < 15 yrs ☐

5. Land holding / farm size
(enter X in box in first column if not known)

	Area	Units *(tick)*	
Crops	☐	Acres	☐
Grazing *	☐	Hectares	☐
Forest	☐		

Total size ☐

* Other than communal

6. Land ownership
(Tick one or more)

Own ☐
Lease ☐
Other ☐ (specify) _____

7. Livestock activity

Is livestock the major activity on your farm?
Yes ☐ No ☐

8. Sources of income

(Tick first column as appropriate, rank level of source of income in second column – 1 highest.)

1. Crops	☐	☐
2. Livestock and products *	☐	☐
3. Home industries	☐	☐
4. Salary / wages	☐	☐

Other (specify)

5. _____ ☐ ☐

* Include the value of non-cash outputs or products e.g. manure, traction etc.

9. Livestock kept
(enter numbers in first column)

	Numbers	Most important species *(rank up to 3: (1, 2, 3)*
1. Cattle	☐	☐
2. Sheep	☐	☐
3. Goats	☐	☐
4. Chickens †	☐	☐
5. Pigs	☐	☐
6. Donkeys	☐	☐

Other (specify)

7. _____ ☐ ☐

† Adult birds only

10. Livestock production category
(Divide numbers given in question 9. into the following categories)

	Dairy	Meat	Dual purpose
1. Cattle	☐	☐	☐
2. Sheep	☐	☐	☐
3. Goats	☐	☐	☐

1. System of production

(Tick one or more)

1. Industrial/intensive .. ☐
2. Semi-intensive ……. ☐
3. Extensive/pastoral … ☐
4. Free range / backyard ☐

Other (specify)

5. _____ ☐

2. Purpose of keeping chickens

Ask an open question and tick any purpose considered in first half of box-one or more boxes to be ticked. Then rank top three by writing in second half of a box 1 for primary purpose, 2 for second, 3 for third.

1. Meat …… ☐☐
2. Eggs …… ☐☐
3. Feathers ……..… ☐☐
4. Stud breeding …… ☐☐
5. Manure ……..……. ☐☐
6. Cash from sales … ☐☐
7. Investment ……..… ☐☐
8. Dowry …… ☐☐
9. Ceremonies …… ☐☐
10. Cultural ……..… ☐☐

Other (specify)

11. _____ ☐☐

3. Members of household who own chickens *(Tick one or more)*

Head …….. ☐
Spouse …… ☐
Head/spouse together … ☐
Sons …… ☐
Daughters …….. ☐
Others * …… ☐

* Describe _____

4. Members of household responsible for chicken activities
(Tick as appropriate; more than one column in a row may be ticked)

	Adults Males	Adults Females	Boys (<15y)	Girls (<15y)	Hired labour
1. Purchasing chickens ……	☐	☐	☐	☐	☐
2. Selling / slaughtering chickens	☐	☐	☐	☐	☐
3. Breeding decisions ……..	☐	☐	☐	☐	☐
4. Feeding ……	☐	☐	☐	☐	☐
5. Selling eggs …….	☐	☐	☐	☐	☐
6. Bird health ……..	☐	☐	☐	☐	☐
Other (specify)					
7. _____	☐	☐	☐	☐	☐

5. Type of housing

1. Run + battery ☐
2. Run + deep litter ☐
3. None ☐

Other (specify)

4. _____ ☐

6. Supplementation regime
(Tick one or more)

1. Kitchen waste …….. ☐
2. Bought complete ration ….. ☐
3. Home-made ration …….. ☐
4. Crushed grain …….. ☐
5. Whole grain ……. ☐

Other (specify)

6. _____ ☐

7. Method of hatching
(Tick as appropriate)

1. Incubator ☐
2. Natural ☐

Other (specify)

3. _____ ☐

1. Access to veterinary services
(Tick as appropriate)

1. Government vet. ☐
2. Private vet. ☐
3. Veterinary drug supplier ☐
4. Extension service ☐
5. None ☐

Other (specify)

6. _____ ☐

2. Prevalent diseases that occur on farm
(i.e. diseases that are seen by farmer in his birds)

If none tick this box ☐

Local name or symptoms of disease *(Rank, most common first)*	Code *	Are birds treated when sick? Yes	No	Treatment given (if known)	Code *
1. _____	☐	☐	☐	_____	☐
2. _____	☐	☐	☐	_____	☐
3. _____	☐	☐	☐	_____	☐
4. _____	☐	☐	☐	_____	☐
5. _____	☐	☐	☐	_____	☐

**(codes to be entered later from lists of diseases and treatments)*

3. Vaccinations/preventive treatments given

If none tick this box ☐

Local name or symptoms of disease	Code *	Done routinely *(Tick as appropriate)*	Done when need arises
1. _____	☐	☐	☐
2. _____	☐	☐	☐
3. _____	☐	☐	☐
4. _____	☐	☐	☐
5. _____	☐	☐	☐

**(code to be entered later from list of diseases)*

4. Ectoparasite control

Method	*(Tick)*	Done when need arises: dry season	Done when need arises: wet season	Done routinely: dry season	Done routinely: wet season	*If done routinely specify how often*: dry season	*If done routinely specify how often*: wet season
1. None	☐						
2. Spray	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
3. Traditional	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

If traditional method specify _____ Code ☐ *(to be entered from list of traditional methods)*

Other (specify)

4. _____	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

1. Numbers of entries within last 12 months
(Enter X in a box if not known, 0 if answer is none)

	Adults Males	Adults Females
1. Bred ……		
2. Bought ……		
3. Donated/gift …..		
4. Exhanged/lent …		

2. Numbers of exits within last 12 months
(Enter X in a box if not known, 0 if answer is none)

	Adults Males	Adults Females
1. Died …….		
2. Sold ……..		
3. Slaughtered …..		
4. Exchanged/lent		
5. Donated/gift …..		
6. Stolen ……		

3. Sale outlet *(if sold in last 12 months)*

Were birds sold? Yes ☐ No ☐

If yes tick one or more boxes.

1. Sold at auction
2. Sold to butcher
3. Sold privately
4. Sold to abattoir

Other (specify)

5. _____

4. Reasons for culling / disposal

Ask as open question and tick any answers given in first
half of box, one or more boxes to be ticked. Then rank top three by writing in second half of box 1 for primary reason for culling, 2 for second and 3 for third.

	Males	Females
1. Size ……		
2. Conformation / shape ……		
3. Colour ……		
4. Comb/feathers ……		
5. Temperament …….		
6. Health ……		
7. Body condition …….		
8. Performance ……..		
9. Old age ……..		
10. Poor fertility ……..		

Other (specify)

11. _____		
12. _____		

1. Primary reason for keeping cockerels(s)
(Tick one)

1. Breeding …… ☐
2. Socio-cultural …… ☐

Other (specify)

3. _____ ☐

2. Reasons for choice of cockerel(s) for breeding
If breeding not done proceed to next page.

Ask an open question and tick any reason for choice considered in first half of box, one or more boxes to be ticked. Then rank top three by writing in second half of box 1 for primary reason for choice, 2 for second and 3 for third.

1. Size …….. ☐☐
2. Conformation/shape …… ☐☐
3. Colour ……. ☐☐
4. Comb/feathers ……. ☐☐
5. Temperament …….. ☐☐
6. Performance …… ☐☐
7. Availability (no choice) …… ☐☐

Other (specify)

8. _____ ☐☐

3. Mating

(Tick one or More boxes)

1. Uncontrolled …. ☐
2. Hand mating ….. ☐
3. Group mating …. ☐

Other (specify)

4. _____ ☐

4. Source and breed(s) of cockerel(s) used in the household

Breed name(s) *(specify if known – crosses can be included.)*

Tick one or more boxes		**Breed type 1 Common name**	Code*	**Breed type 2 Common name**	Code*
1. Own cockerel (bred)	☐	_____	☐☐	_____	☐☐
2. Own cockerel (bought)	☐	_____	☐☐	_____	☐☐
3. Cockerel donated	☐	_____	☐☐	_____	☐☐
4. Cockerel borrowed	☐	_____	☐☐	_____	☐☐
5. Unknown cockerel	☐	_____	☐☐	_____	☐☐

**(code to be entered from list of breeds – use first box only if pure breed, two boxes if cockerel is a crossed breed)*

Number of pure breeds * | 0 | 1 | 2 | 3 | 4 | 5 | *(tick)*

** If crossing of two breeds has resulted in a genotype that is recognised and maintained as a breed, then count this as a separate breed and include it on this form. If no pure breeds tick 0 in box and complete section on mixed crosses form. If more than two pure breeds, third breed can be entered on mixed crosses form.*

BREED 1 ☐ **Code** *(from list of breeds)*

1. Common breed name _____

Local breed name _____

2. Trend within flock *(tick one)*

Increasing ☐ Decreasing ☐
Stable ☐ Unknown ☐

3. Number of adult birds

Male ☐ Female ☐

4. Number of eggs

Average number of eggs per laying cycle ☐

Laying cycle every ☐ months

5. Origin/source of breed

1. Inherited ☐
2. Communal area farm ☐
3. Commercial farm * ☐
4. Market * ☐

* *specify location if known* _____

6. Quality of traits perceived by owner
(Ask each question and for each trait tick one box, poor average, good, no opinion)

BREED 2 ☐ **Code** *(from list of breeds)*

1. Common breed name _____

Local breed name _____

2. Trend within flock *(tick one)*

Increasing ☐ Decreasing ☐
Stable ☐ Unknown ☐

3. Numbers of adult birds

Male ☐ Female ☐

4. Number of eggs

Average number of eggs per laying cycle ☐

Laying cycle every ☐ months

5. Origin/source of breed

1. Inherited ☐
2. Communal area farm ☐
3. Commercial farm * ☐
4. Market * ☐

* *specify location if known* _____

6. Quality of traits perceived by owner
(Ask each question and for each trait tick one box, poor, average, good, no opinion)

Poor	Average	Good	No opinion/ not important		Poor	Average	Good	No opinion/ not important
☐	☐	☐	☐	1. Size	☐	☐	☐	☐
☐	☐	☐	☐	2. Conformation / shape	☐	☐	☐	☐
☐	☐	☐	☐	3. Feathers for ornaments	☐	☐	☐	☐
☐	☐	☐	☐	4. Feathers/bird appearance	☐	☐	☐	☐
☐	☐	☐	☐	5. Comb	☐	☐	☐	☐
☐	☐	☐	☐	6. Neck (naked)	☐	☐	☐	☐
☐	☐	☐	☐	7. Disease tolerance	☐	☐	☐	☐
☐	☐	☐	☐	8. Drought tolerance	☐	☐	☐	☐
☐	☐	☐	☐	9. Heat tolerance	☐	☐	☐	☐
☐	☐	☐	☐	10. Temperament	☐	☐	☐	☐
☐	☐	☐	☐	11. Control of flies	☐	☐	☐	☐
☐	☐	☐	☐	12. Broodiness	☐	☐	☐	☐
☐	☐	☐	☐	13. Egg numbers	☐	☐	☐	☐
☐	☐	☐	☐	14. Meat taste/quality	☐	☐	☐	☐
☐	☐	☐	☐	15. Growth rate	☐	☐	☐	☐
☐	☐	☐	☐	16. Fertility	☐	☐	☐	☐
☐	☐	☐	☐	17. Scavenging ability	☐	☐	☐	☐
				Other (specify)				
☐	☐	☐	☐	18. _____	☐	☐	☐	☐

This form is also designed for a third pure breed. If there is a fourth pure breed this should be included under mixed crosses and ranked 1; likewise a fifth breed would be ranked 2.

BREED 3 **Code** ☐
(from list of breeds)

1. Common breed name _____

Local breed name _____

2. Trend within flock *(tick one)*

Increasing ☐ Decreasing ☐
Stable ☐ Unknown ☐

3. Number of adult birds

Male ☐ Female ☐

4. Number of eggs

Average number of eggs per laying cycle ☐

Laying cycle every ☐ months

5. Origin/source of breed

1. Inherited ☐
2. Communal area farm ☐
3. Commercial farm * ☐
4. Market * ☐

* *specify location of known* _____

6. Quality of traits perceived by owner
(Ask each question and for each trait tick one box, poor, average, good, no opinion)

MIXED CROSSES

1. Breeds apparently used to produce mixed crosses of chicken in flock (rank up to four breeds in order of probable influence – use owner's knowledge if known)

Rank **Code**

1. ☐ Common name _____ Local name _____
2. ☐ Common name _____ Local name _____
3. ☐ Common name _____ Local name _____
4. ☐ Common name _____ Local name _____

or unknown ☐

2. Numbers of adult birds

Male ☐ Female ☐

3. Number of eggs

Average number of eggs per laying cycle ☐

Laying cycle every ☐ months

4. Quality of traits perceived by owner
(Ask each question and for each trait tick one box, poor, average, good, no opinion)

Poor	Average	Good	No opinion/ not important		Poor	Average	Good	No opinion/ not important
☐	☐	☐	☐	..... 1. Size	☐	☐	☐	☐
☐	☐	☐	☐	..... 2. Conformation / shape	☐	☐	☐	☐
☐	☐	☐	☐	..... 3. Feathers for ornaments.....	☐	☐	☐	☐
☐	☐	☐	☐	..... 4. Feathers/bird performance ..	☐	☐	☐	☐
☐	☐	☐	☐	..... 5. Comb	☐	☐	☐	☐
☐	☐	☐	☐	..... 6. Neck (naked)	☐	☐	☐	☐
☐	☐	☐	☐	..... 7. Disease tolerance	☐	☐	☐	☐
☐	☐	☐	☐	..... 8. Drought tolerance	☐	☐	☐	☐
☐	☐	☐	☐	..... 9. Heat tolerance	☐	☐	☐	☐
☐	☐	☐	☐	..... 10. Temperament	☐	☐	☐	☐
☐	☐	☐	☐	..... 11. Control of flies.....	☐	☐	☐	☐
☐	☐	☐	☐	..... 12. Broodiness	☐	☐	☐	☐
☐	☐	☐	☐	..... 13. Egg numbers	☐	☐	☐	☐
☐	☐	☐	☐	..... 14. Meat taste/quality	☐	☐	☐	☐
☐	☐	☐	☐	..... 15. Growth rate	☐	☐	☐	☐
☐	☐	☐	☐	..... 16. Fertility	☐	☐	☐	☐
☐	☐	☐	☐	..... 17. Scavenging ability	☐	☐	☐	☐
				Other (specify)				
☐	☐	☐	☐	..... 18. _____	☐	☐	☐	☐

IF MORE THAN ONE PURE BREED SELECT ONE BREED.

1. Breed common name _____ **Code** ☐ *(from list of breeds)*

2. Colour *Enter number(s) from colour chart. Complete more than one portion of triple or double box if birds have more than one colour, main colour first; second colour second; third colour third; first box only if uniform. Rank in order of frequency of colour combinations in flock.*

	Rank	Males	Females
Plumage	1.	☐☐☐	☐☐☐
	2.	☐☐☐	☐☐☐
	3.	☐☐☐	☐☐☐
	4.	☐☐☐	☐☐☐
	5.	☐☐☐	☐☐☐

	Rank	M	F
Skin	1.	☐	☐
	2.	☐	☐
	3.	☐	☐
Leg/foot	1.	☐	☐
	2.	☐	☐
	3.	☐	☐
Ear lobes	1.	☐	☐
	2.	☐	☐
Beak	1.	☐	☐
	2.	☐	☐
	3.	☐	☐
Chicks	1.	☐	☐
	2.	☐	☐
	3.	☐	☐

3. Plumage Feathers *(1 or more ticks allowed)*

	M	F
1. Barred	☐	☐
2. Cuckoo	☐	☐
3. Mottled	☐	☐
4. Pencilled	☐	☐
5. Spotted	☐	☐
6. Partridge	☐	☐
7. Uniform	☐	☐

Frizzle Present ☐ Absent ☐ Density Full ☐ Sparse ☐

Neck Feathered ☐ Naked ☐

4. Head features Comb *(1 or more ticks allowed)*

	M	F
1. Single	☐	☐
2. Pea	☐	☐
3. Rose	☐	☐
4. V-shaped	☐	☐
5. Walnut	☐	☐
6. Absent	☐	☐

Comb size

	M	F
1. Small	☐	☐
2. Medium	☐	☐
3. Large	☐	☐

Wattles

	M	F
Present	☐	☐
Absent	☐	☐

		M	F
Beak	Short	☐	☐
	Medium	☐	☐
	Long	☐	☐

Beak Hooked ☐ Straight ☐

		M	F
Earlobes	Small	☐	☐
	Large	☐	☐

5. Legs Length

	M	F
Short	☐	☐
Medium	☐	☐
Long	☐	☐

Feathers Present ☐ Absent ☐ Spur size Rudimentory ☐ Medium ☐ Long ☐ Number of toes / digits ☐

6. Body Frame

	M	F
Small	☐	☐
Medium	☐	☐
Large	☐	☐

Shape Blocky/compact ☐ Angular/tallish ☐

7. Tail Length Short ☐ Medium ☐ Long ☐

8. Eggs Shell colour *(1 or more ticks allowed)*

1. White	☐
2. Brown	☐
3. Tinted	☐
4. Light brown	☐
5. Reddish	☐
6. Red spotted	☐
7. Other _____	☐

Size

1. Small	☐
2. Medium	☐
3. Large	☐
4. Mixed	☐

MANAGEMENT OF FARM ANIMAL GENETIC RESOURCES IN THE SADC REGION

SADC/UNDP/FAO PROJECT RAF/97/032
National Department of Agriculture
Private Bag XI38, Pretoria, South Africa
TEL: (27-12) 319-7424/7622; FAX: (27-12) 329-7220

ZIMBABWE FARM ANIMAL GENETIC RESOURCES SURVEY

QUESTIONNAIRE - DONKEYS

Enumerator Name _____ Code no. ☐ Date of interview / /

Supervisor Name _____ Code no. ☐

1. Province Name _____ Code no. ☐

2. District Name _____ Code no. ☐

3. Ward Name _____ Code no. ☐

4. Village (VIDCO) Name _____ Code no. ☐

5. Farm type Communal ☐ Small-scale commercial ☐ Large-scale commercial ☐

6. GPS reading _____ *(to be filled in later)* **7. Household** No ☐

8. Wealth category | rich | medium | poor | not classified | *(tick one)*

The overall objective of the survey, which is to be repeated in other SADC countries, is to obtain reliable estimates of population size and distribution of farm animal breed resources as well as to determine management/ production and socio-cultural practices employed by farmers in raising these animals. The surveys will enable simple, regular updating of breed information and facilitate updating of the databank on the FAO DAD-IS system. With this information, countries will be able to:

- develop comprehensive plans for the management of FAnGR,
- develop and harmonize support policies for FAnGR Management,
- facilitate development of appropriate animal recording systems and sustainable breeding programs,
- facilitate development and implementation of relevant conservation activities.

The activity is jointly funded by UNDP through the SADC FAnGR Program (**RAF/97/032)** and the Governments of Norway and Finland through the FAO Integrated Support to Sustainable Development and Food Security Program (**GCP/INT/694 NOR).**

The survey in Zimbabwe is being conducted by Matopos Research Station, in collaboration with the University of Zimbabwe and with the support of the International Livestock Research Institute.

1. Interviewee _____

Position in household
1. Household head ☐
2. Spouse of head ☐
3. Brother ☐
4. Sister ☐
5. Son ☐
6. Daughter ☐

Other (specify)

7. _____ ☐

2. Household head

Sex of head
Male ☐
Female ☐

Age (yrs)
≤ 30 ☐
31-40 ☐
41-50 ☐
51-60 ☐
61-70 ☐
> 70 ☐
Not known ☐

3. Tribe

Name _____

Code ☐

4. Number of people residing in household

Males ☐
Females ☐
Children < 15 yrs ☐

5. Land holding / farm size
(enter X in box in first column if not known)

	Area	Units *(tick)*	
Crops	☐	Acres	☐
Grazing *	☐	Hectares	☐
Forest	☐		

Total size ☐
* Other than communal

6. Land ownership
(Tick one or more)

Own ☐
Lease ☐
Other ☐ (specify) _____

7. Livestock activity

Is livestock the major activity on your farm?
Yes ☐ No ☐

8. Sources of income

(Tick first column as appropriate, rank level of source of income in second column – 1 highest.)

1. Crops	☐	☐
2. Livestock and products *	☐	☐
3. Home industries	☐	☐
4. Salary / wages	☐	☐

Other (specify)

5. _____ ☐ ☐

* Include the value of non-cash outputs or products e.g. manure, traction etc.

9. Livestock kept
(enter numbers in first column)

	Numbers	Most important species *(rank up to 3: (1, 2, 3)*
1. Cattle	☐	☐
2. Sheep	☐	☐
3. Goats	☐	☐
4. Chickens †	☐	☐
5. Pigs	☐	☐
6. Donkeys	☐	☐

Other (specify)

7. _____ ☐ ☐

† Adult birds only

10. Livestock production category
(Divide numbers given in question 9. into the following categories)

	Dairy	Meat	Dual purpose
1. Cattle	☐	☐	☐
2. Sheep	☐	☐	☐
3. Goats	☐	☐	☐

1. System of production *(Tick one or more)*

1. Industrial/intensive… ☐
2. Semi-intensive ……. ☐
3. Extensive/pastoral … ☐
4. Free range / backyard ☐

Other (specify)

5. _____ ☐

2. Mobility *(Tick one or more)*

1. Sedentary ☐
2. Transhumant ☐
3. Nomadic ☐

Other (specify)

4. _____ ☐

3. Purpose of keeping donkeys

Ask an open question and tick any purpose considered in first half of box - one or more boxes to be ticked. Then rank top three by writing in second half of a box 1 for primary purpose, 2 for second, 3 for third.

1. Meat ……...	☐	☐
2. Transport ……...	☐	☐
3. Work/draft ……..…	☐	☐
4. Stud breeding ……	☐	☐
5. Manure ……..…….	☐	☐
6. Cash from sales …	☐	☐
7. Investment ……..…	☐	☐
8. Dowry ……	☐	☐
9. Ceremonies ……..…	☐	☐
10. Cultural ……..……	☐	☐

Other (specify)

11. _____ ☐☐

4. Members of household who own donkeys *(Tick one or more)*

Head …….. ☐
Spouse …… ☐
Head/spouse together … ☐
Sons ……... ☐
Daughters …….. ☐
Others * ……. ☐

* Describe _____

5. Members of household responsible for donkey activities
(Tick as appropriate; more than one column in a row may be ticked)

	Adults Males	Adults Females	Boys (<15y)	Girls (<15y)	Hired labour
1. Purchasing donkeys …….	☐	☐	☐	☐	☐
2. Selling donkeys …….	☐	☐	☐	☐	☐
3. Herding ……..	☐	☐	☐	☐	☐
4. Breeding decisions …….	☐	☐	☐	☐	☐
5. Feeding ……..	☐	☐	☐	☐	☐
6. Working …….	☐	☐	☐	☐	☐
7. Transport ……..	☐	☐	☐	☐	☐
8. Animal health ……	☐	☐	☐	☐	☐
Other (specify)					
9. _____	☐	☐	☐	☐	☐

6. Grazing/feeding

	Dry season	Wet season
1. Herded ……..	☐	☐
2. Paddock …….	☐	☐
3. Tethered ……	☐	☐
4. Stall ……	☐	☐
5. Yard ……...	☐	☐
6. Free grazing ..	☐	☐
Other (specify)		
7. _____	☐	☐

7. Housing

	Dry season	Wet season
1. Kraal ……	☐	☐
2. Stall/shed	☐	☐
3. Yard ……..	☐	☐
4. None …….	☐	☐
Other (specify)		
5. _____	☐	☐

If animals not housed go to question 10.

8. Materials used for housing
(Tick one or more)

1. Untreated wood/bush … ☐
2. Treated wood …… ☐
3. Iron sheets …… ☐
4. Bricks …….. ☐
5. Mud ……. ☐
6. Wire …….. ☐

Other (specify)

7. _____ ☐
8. _____ ☐

9. Form of housing
(Tick if present)

1. Roof ☐
2. Solid wall ☐
3. Floor
   a. concrete ☐
   b. wooden ☐
   c. earth ☐

10. Supplementation regime
(Tick as appropriate)

	Dry season	Wet season
1. Roughage/crop residue	☐	☐
2. Minerals (salts) / vitamins	☐	☐
3. Bought-in feed / concentrates	☐	☐
4. None	☐	☐
Other (specify)		
5. _____	☐	☐
6. _____	☐	☐

11. How donkeys are watered

	Dry season	Wet season
1. Animals go to water	☐	☐
2. Water is fetched/provided	☐	☐
3. Both	☐	☐

12. Source of water
(Tick one or more)

	Dry season	Wet season
1. Borehole ……	☐	☐
2. Dam/pond ……..	☐	☐
3. River ……..	☐	☐
4. Water well …….	☐	☐
5. Spring ……	☐	☐
6. Municipal/piped ……	☐	☐
Other (specify)		
6. _____	☐	☐

13. Distance to farthest watering point

	Dry season	Wet season
1. At household …….	☐	☐
2. <1km …….	☐	☐
3. 1-5 km ……...	☐	☐
4. 6-10 km …….	☐	☐
5. >10 km ……..	☐	☐

14. Frequency of watering

	Dry season	Wet season
1. Freely available	☐	☐
2. Once a day	☐	☐
3. Twice a day	☐	☐
4. Every other day	☐	☐
5. Once in 3 days	☐	☐
Other (specify)		
6. _____	☐	☐

15. Water quality
(Tick one or more)

	Dry season	Wet season
1. Good/clear ……	☐	☐
2. Muddy ……..	☐	☐
3. Salty …….	☐	☐
4. Smelly ……..	☐	☐

1. Access to veterinary services
(Tick as appropriate)

1. Government vet. ☐
2. Private vet. ☐
3. Veterinary drug supplier ☐
4. Extension service ☐
5. None ☐

Other (specify)

6. _____ ☐

2. Prevalent diseases that occur on farm
(i.e. diseases that are seen by farmer in his animals)

If none tick this box ☐

Local name or symptoms of disease *(Rank, most common first)*	Code *	Are animals treated when sick? Yes	No	Treatment given (if known)	Code *
1.					
2.					
3.					
4.					
5.					
6.					

**(codes to be entered later from lists of diseases and treatments)*

3. Vaccinations/preventive treatments given

If none tick this box ☐

Local name or symptoms of disease	Code *	Done routinely *(Tick as appropriate)*	Done when need arises
1.			
2.			
3.			
4.			
5.			
6.			

**(code to be entered later from list of diseases)*

4. Ectoparasite control

Method	*(Tick)*	Done when need arises: dry season	Done when need arises: wet season	Done routinely: dry season	Done routinely: wet season	*If done routinely specify how often* — dry season	wet season
1. None	☐						
2. Dip	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
3. Spray	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
4. Pour-on	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
5. Hand dressing	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
6. Injectables	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
7. Traditional	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

If traditional method specify _____ Code ☐ *(to be entered from list of traditional methods)*

Other (specify)

8. _____ ☐ ☐ ☐ ☐ ☐ every ☐ weeks every ☐ weeks

5. Trypanosomosis control

Method	*(Tick)*	Done when need arises: dry season	Done when need arises: wet season	Done routinely: dry season	Done routinely: wet season	*If done routinely specify how often* — dry season	wet season
1. None (n/a)	☐						
2. Chemotherapy	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
3. Pour-on	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
4. Traditional	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

If traditional method specify _____ Code ☐

Other (specify)

5. _____ ☐ ☐ ☐ ☐ ☐ every ☐ weeks every ☐ weeks

6. Intestinal parasite control

Method	*(Tick)*	Done when need arises: dry season	Done when need arises: wet season	Done routinely: dry season	Done routinely: wet season	*If done routinely specify how often* — dry season	wet season
1. None	☐						
2. Drench	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks
3. Traditional	☐	☐	☐	☐	☐	every ☐ weeks	every ☐ weeks

If traditional method specify _____ Code ☐

Other (specify)

4. _____ ☐ ☐ ☐ ☐ ☐ every ☐ weeks every ☐ weeks

1. Castration

Do you castrate? Yes ☐
No ☐

If yes, say why. (*Tick one or more boxes)*

1. Control breeding …….. ☐
2. Better draft power …… ☐
3. Better temperament ……. ☐

Other (specify)

4. _____ ☐

and at what age?

< 3 months ☐
3-6 months ☐
6-12 months ☐
> 12 months ☐

4. Sale outlet *(if sold in last 12 months)*

Were animals sold? Yes ☐ No ☐

If yes tick one or more boxes.

1. Sold at auction ☐
2. Sold to butcher ☐
3. Sold privately ☐
4. Sold to abattoir ☐

Other (specify)

5. _____ ☐

5. Exchange

Would donkeys ever be exchanged for cattle ?
Yes ☐ No ☐

If yes, how many donkeys for a bull ☐ ,
cow ☐ , calf ☐ ?

2. Numbers of entries within last 12 months

For questions 2. and 3. first ask for information on foals and others (i.e. weaners and adults total). Then complete individual columns for weaners and adults if known. Enter X in a box if not known, 0 if answer is none.

		Weaners and Adults			
		Adults			Total
	Foals	Weaners	Males	Females	W + A
1. Born ……..	☐				
2. Bought ……..	☐	☐	☐	☐	☐
3. Donated/gift * ..	☐	☐	☐	☐	☐
4. Exchanged/lent	☐	☐	☐	☐	☐

** to include bride price and dowry*

3. Numbers of exits within last 12 months

		Weaners and Adults			
		Adults			
	Foals	Weaners	Males	Females	Total W + A
1. Died …….	☐	☐	☐	☐	☐
2. Sold ……..	☐	☐	☐	☐	☐
3. Slaughtered	☐	☐	☐	☐	☐
4. Donated/gift *	☐	☐	☐	☐	☐
5. Exchanged/lent	☐	☐	☐	☐	☐
6. Stolen	☐	☐	☐	☐	☐

** to include bride price and dowry*

6. Reasons for culling / disposal

Ask as open question and tick any answers given in first *half of box, one or more boxes to be ticked. Then rank top three by writing in second half of box 1 for primary reason for culling, 2 for second and 3 for third.*

	Males	Females
1. Size ……	☐☐	☐☐
2. Conformation / shape ……	☐☐	☐☐
3. Colour ……	☐☐	☐☐
4. Temperament …….	☐☐	☐☐
5. Health …….	☐☐	☐☐
6. Body condition ……..	☐☐	☐☐
7. Performance ……..	☐☐	☐☐
8. Old age ……..	☐☐	☐☐
9. Poor fertility ……..	☐☐	☐☐

Other (specify)

10. _____	☐☐	☐☐
11. _____	☐☐	☐☐

1. Primary reason for keeping male(s)
(Tick one)

1. Breeding …….. ☐
2. Socio-cultural …….. ☐
3. Work / draft ……. ☐
4. Transport ……. ☐

Other (specify)

5. _____ ☐

2. Reasons for choice of male(s) for breeding
If breeding not done proceed to question 5.

Ask an open question and tick any reason for choice
considered in first half of box, one or more boxes to be ticked. Then rank top three by writing in second half of box 1 for primary reason for choice, 2 for second and 3 for third.

1. Size …….. ☐☐
2. Conformation/shape …… ☐☐
3. Colour …….. ☐☐
4. Temperament …….. ☐☐
5. Performance …… ☐☐
6. Availability (no choice) …….. ☐☐

Other (specify)

7. _____ ☐☐

3. Mating

(Tick one or more boxes)

1. Uncontrolled ☐
2. Hand mating ☐
3. Group mating ☐

Other (specify)

4. _____ ☐

4. Sources of male(s) used for breeding on the farm.

1. Own donkey (bred) ☐
2. Own donkey (bought) ☐
3. Donkey donated ☐
4. Donkey borrowed ☐
5. Communal area donkey ☐

5. Use of donkeys for work/draft

Are donkeys used for work/draft? Yes ☐ No ☐

If yes, are both males and females used for draft? Yes ☐ No ☐

What spanning formation is used?
(Tick one or more boxes)

1. Donkeys only o-o ☐
2. Donkeys only o-o-o-o ☐
3. Donkeys only o-o ☐
   o-o
4. With cattle ☐

Other (specify)

5. _____ ☐

COMPLETE THIS FORM FOR ALL DONKEYS

1. Breeds of donkeys ***(rank if known – use owner's knowledge if known)***

Rank	Common breed name	Local breed name	Code *
1	_____	_____	☐
2	_____	_____	☐
3	_____	_____	☐

** (code to be entered from list of breeds)*

2. Numbers by age and sex
(enter X in box if not known)

	Foals	Weaners	Adults
Intact male	☐	☐	☐
Castrate	☐	☐	☐
Female	☐	☐	☐

How old is the oldest animal? ☐ years

3. Origin/source of donkeys

1. Inherited ☐
2. Communal area farm ☐
3. Commercial farm * ☐
4. Market * ☐

** specify location if known*
_____

4. Quality of traits perceived by owner

(Ask each question and for each trait tick one box, - poor, average, good, no opinion)

	Poor	Average	Good	No opinion/ not important
1. Size ……..	☐	☐	☐	☐
2. Conformation / shape ……	☐	☐	☐	☐
3. Colour ……..	☐	☐	☐	☐
4. Disease tolerance ……..	☐	☐	☐	☐
5. Drought tolerance …….	☐	☐	☐	☐
6. Heat tolerance ……..	☐	☐	☐	☐
7. Temperament ……..……..	☐	☐	☐	☐
8. Work rate/draft power ……..	☐	☐	☐	☐
9. Growth rate ……..	☐	☐	☐	☐
10. Fertility …….	☐	☐	☐	☐
Other (specify)				
11. _____	☐	☐	☐	☐

IF MORE THAN ONE PURE BREED SELECT ONE BREED.

1. Breed common name _____ **Code** ☐ *(from list of breeds)*

2. Coat description Hair

Short	☐	Straight	☐
Medium	☐	Curly	☐
Long	☐		

3. Colour *Enter number(s) from colour chart. Complete both halves of double box if animals have more than one colour, main colour first; complete first half only if uniform colour. Rank in order of frequency of colour combinations in animals.*

	Rank		*Rank*		*Rank*		*Rank*		*Rank*	
Body	1. ☐☐	Head	1. ☐☐	Ear tips	1. ☐	Tail switch	1. ☐☐	Hoof	1. ☐☐	
	2. ☐☐		2. ☐☐		2. ☐		2. ☐☐		2. ☐☐	
	3. ☐☐		3. ☐☐		3. ☐		3. ☐☐			
	4. ☐☐		4. ☐☐							
	5. ☐☐		5. ☐☐							

Muzzle 1. ☐☐
2. ☐☐

4. Body Size

		M	F			M	F
Height	< 90 cm	☐	☐	Length	< 80 cm	☐	☐
	< 110 cm	☐	☐		< 100 cm	☐	☐
	< 130 cm	☐	☐		< 120 cm	☐	☐
	> 130 cm	☐	☐		> 120 cm	☐	☐

5. Back cross

Present in all	☐
Present in some	☐
Absent	☐

6. Leg stripes

Present in all	☐
Present in some	☐
Absent	☐

7. Profile

Face *(1 or more ticks allowed)*		Back		Rump	
Flat	☐	Hollow	☐	Flat	☐
Concave	☐	Straight	☐	Sloping	☐
Convex	☐			Roofy	☐

8. Ears Size

		Shape	
Small	☐	Round-edged	☐
Large	☐	Straight-edged	☐

9. Tail Length

				Thickness at base	
Short	(above the hock joint)	☐		Narrow	☐
Medium	(at the hock joint)	☐		Medium	☐
Long	(below the hock joint)	☐		Wide	☐

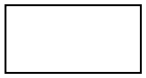
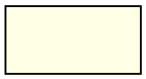
APPENDIX 2

Colour chart

The colour chart used to complete the questions on colour in the Phenotypic description page of the questionnaire is shown here. Note that the colours produced by different computer printers may differ slightly in shade. Thus, it is important to produce a complete set of copies at the central coordinating office ahead of a survey so that there are sufficient copies available for all enumerators. It is a good idea to laminate the charts as this makes them easier to handle in the field.

SADC Farm Animal Genetic Resources Surveys

Colour Chart

1. 
2. 
3. 
4. 
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APPENDIX 3

Breed fact sheet

An example of the breed fact sheets or field guides used for the training courses in Zimbabwe. Data contained in the breed fact sheets were based on selected groups of animals and one of the goals of the livestock breed survey in Zimbabwe was to update the fact sheets. The fact sheet shown here presents phenotypic descriptions of the Tuli breed of cattle.

CATTLE BREEDS FIELD GUIDE

Breed Reference Name: TULI
Local Synonyms:
Strain: CRITERION FARM (MATOPOS RESEARCH STATION)

BREED PHYSICAL CHARACTERISTICS

COAT

- **Colour:** Any colour (white, brownish-grey, beige, yellow, red, tan) except black
- **Pattern:** Uniform
- **Hair type:** Straight
- **Hair length:** Short

HEAD

- **Face Profile:** Flat
- **Muzzle Colour:** Pigmented, Not pigmented

Horns: Present, Absent
Horn Shape Straight

- **Horn Length** Long
- **Horn Spacing** Narrow
- **Horn Orientation** Upwards

Ear Size: Small

- **Colour of ear tips:** Pigmented a bit at the tips
- **Ear Shape:** Round-edged
- **Ear Orientation:** Lateral

BODY

Body Frame: Medium
Back Profile: Hollow, Straight
Rump Profile: Sloping
Hump: Small

- **Hump Orientation:** Erect
- **Hump Location:** Cervico-thoracic

Dewlap: Small
Naval Flap: Small
Legs: Long
Hoofs: Light
Tail

- **Length** Long (below hocks)
- **Thickness at the base:** Wide
- **Colour of the tail switch:** Multicolour (white, dark brown)

Udder size: Small
Teats: Medium

NATURAL PRODUCTION ENVIRONMENT

- Climate (hot and dry)
- Vegetation (savannah range type)
- Production system (extensive, partial supplementation during the dry season, bulling Nov-Feb)
- Health management (all vaccinations, dosing, dipping is conducted regularly, as per government regulations)

BREED DISTRIBUTION