

AN EVALUATION OF SMALL-SCALE PIGGERIES IN LIMPOPO PROVINCE, SOUTH AFRICA.

by

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at

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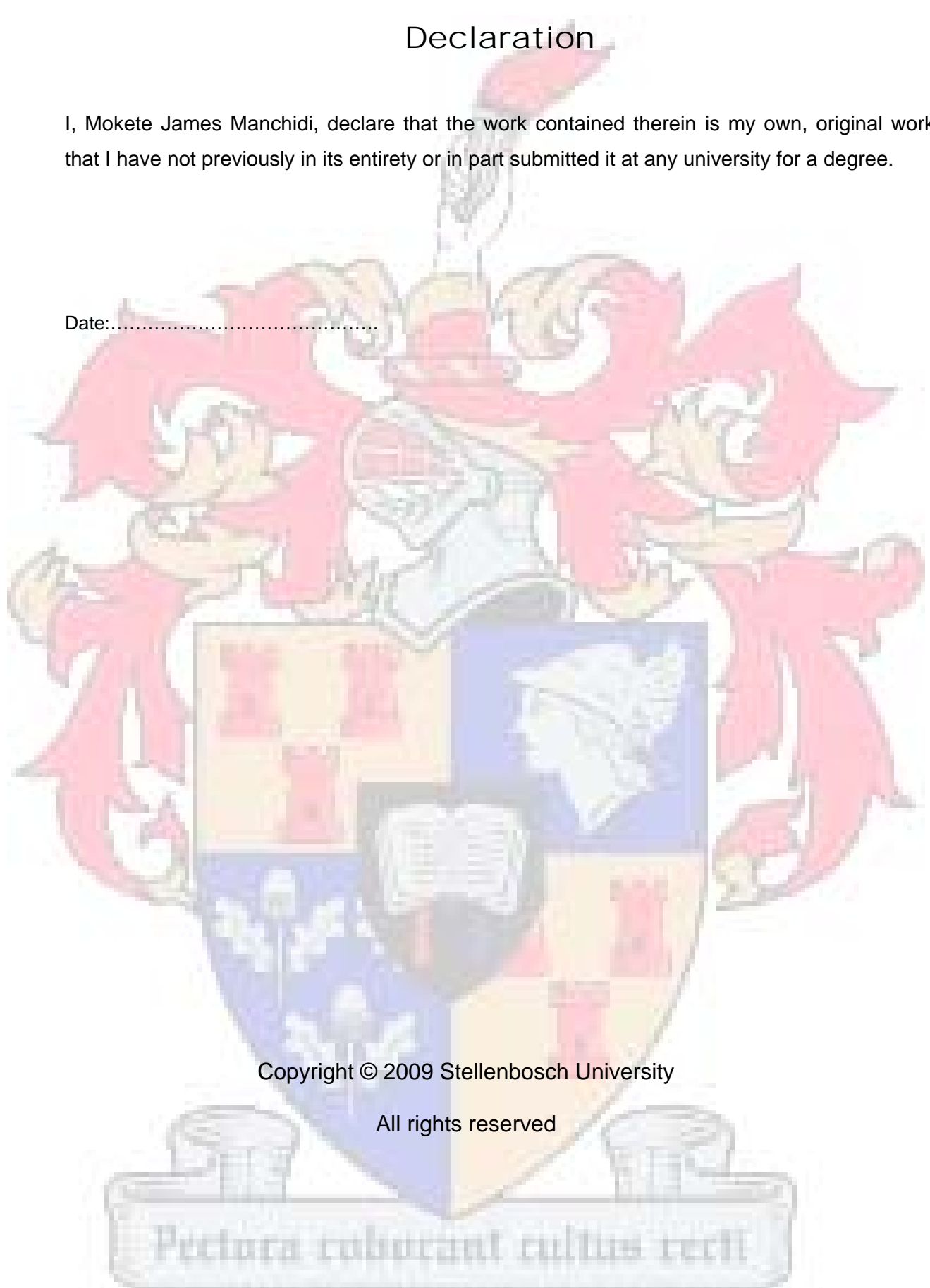
Date: *March 2009*

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Declaration

I, Mokete James Manchidi, declare that the work contained therein is my own, original work that I have not previously in its entirety or in part submitted it at any university for a degree.

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Abstract

This mini-thesis describes the pig industry in South Africa which consists of a commercial intensive sector and an extensive sector that is also known as the small scale sector. Challenges in such as, marketing, feed, housing and genetics of small scale farmers are discussed.

The objective of this study is to identify the problems experienced by the emerging/small scale pig farmers and to benchmark the production parameters of these farmers. Data was collected using questionnaires, telephone and site visits to farms/projects. The data collection was grouped into descriptions of small scale piggeries, feeding strategies, management programs, production parameters, regional constraints, marketing, comparisons between stud and commercial piggeries.

The results were arranged into the following manner: general, regional constraints, description of small scale piggery facilities, feeding strategies of small scale farmers, management programs in small scale piggeries, production parameters of small scale piggeries in the Limpopo province, production parameters of stud and commercial piggeries, and the management strategy in a commercial piggery.

Those piggeries having 5-30 sow units were interviewed. Results indicate that small scale farmers were found not to be sustainable in their production. The small scale farmers have no understanding of the pig industry, genetics and breeding of pigs, feeding strategies, and marketing channels for pigs. Typical problems experienced are: marketing is only done once or twice a year and not regularly as with any commercial piggery – a main problem identified here was access to the formal market. Typical production problems experienced were long farrowing intervals, small litter sizes, late weaning periods and low weaning percentages. This was attributed not only to mismanagement but also to bad infrastructure. Small scale piggeries typically have low cost sty's that have inadequate floors, walls, roofing and very few of the piggeries has sufficient fresh water. Another problem experienced was poor growth which could be directly linked to the nutrition of the pigs. Most of the feed consisted of kitchen waste as balanced diets were perceived to be too expensive whilst access to suppliers, and transport (of both feed and pigs off to market) was generally lacking. Another major problem identified by the producers was insufficient scientific help from Government. Most producers also mentioned that they would welcome a mentorship program and help with the marketing and sourcing of funds. None the less, the pig owners all indicated that they wish to continue farming with pigs and that with the right help, they would be able to be successful.

Opsomming

Hierdie werkstuk beskryf die vark industrie in Suid-Afrika wat bestaan uit 'n kommersiële intensiewe en ekstensiewe sektor wat ook bekend staan as die klein-skaal sektor. Uitdagings soos bemarking, voer, behuising en genetika van klein-skaalse boere word bespreek.

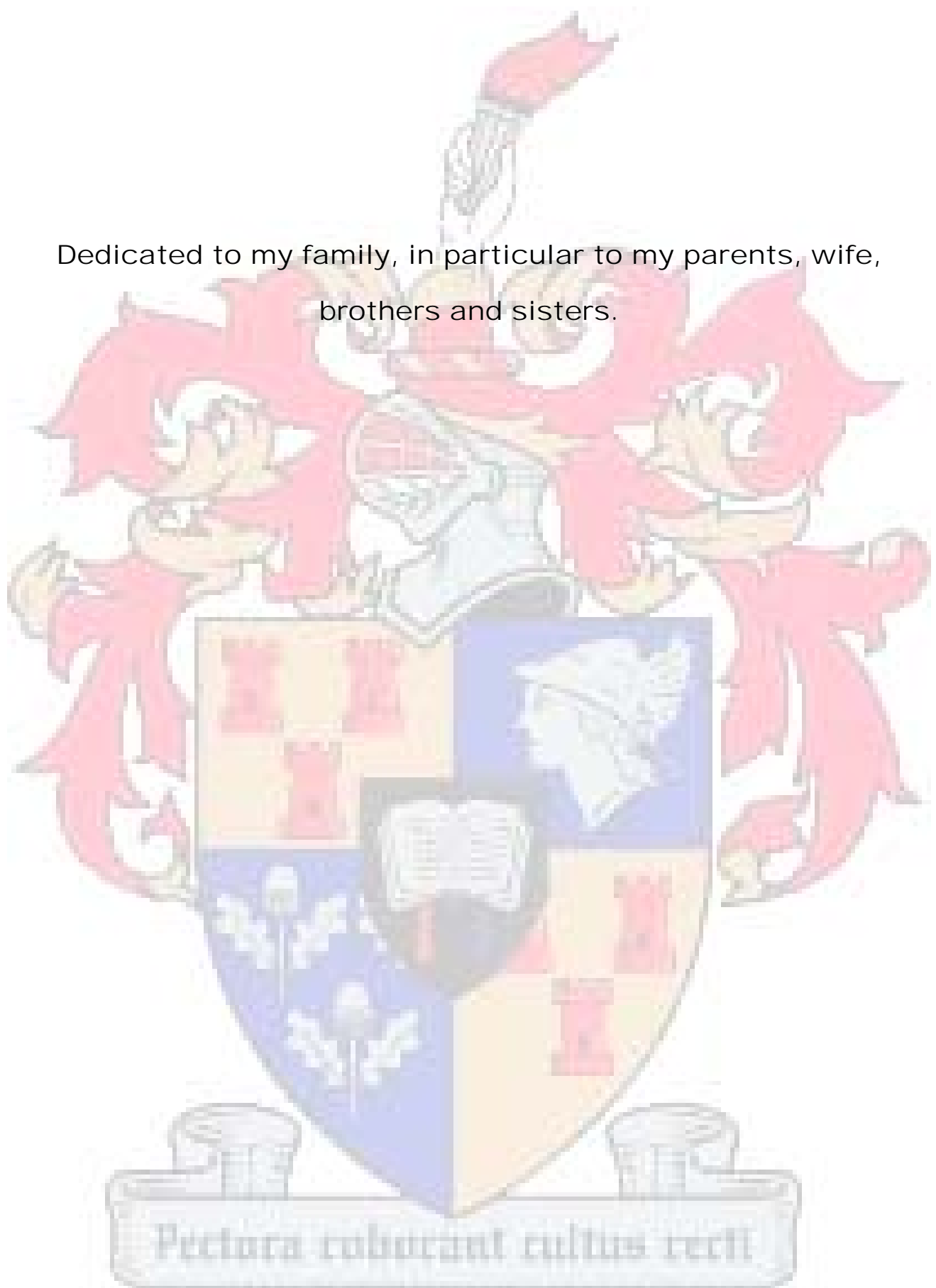
Die doel van die studie is om die probleme te identifiseer wat ervaar word deur die opkomende/klein-skaalse boere asook om die produksie-parameters van die boere te bepaal. Data was versamel deur middel van vraelyste, telefoonoproepe asook besoeke aan die boere/projekte. Die dataversameling was op verdeel in beskrywings van klein-skaalse vark eenhede, voerstrategieë, bestuursprogramme, produksie-parameters, distriksbepelings, bemarking, en vergelykings tussen stoet- en kommersiële-eenhede.

Die resultate was gesorteer op die volgende manier: algemeen, distriksbepelings, beskrywing van klein-skaalse varkeenhede, produksie-parameters van klein-skaalse varkeenhede in die Limpopoprovinsie, produksie-parameters van stoet- en kommersiële varkeenhede, en die bestuurstrategie in 'n kommersiële varkeenheid.

Onderhoude is gevoer met dié eenhede wat tussen 5-30 soë het. Resultate wys dat klein-skaalse boere nie volhoubaar is in hul produksie nie. Die klein-skaalse boere het geen kennis van die vark bedryf, genetika en teel van varke, voerstrategieë en bemarking van varke nie. Tipiese probleme wat ervaar word is: bemarking word slegs een of twee keer per jaar gedoen en nie gereeld soos met kommersiële eenhede nie – die hoof probleem wat geïdentifiseer is die toegang tot die formele mark. Tipiese produksieprobleme wat hier geïdentifiseer is, was lang kraam intervalle, klein werpsel groottes, laat speenperiodes en lae speenpersentasies. Dit was as gevolg van nie net misbestuur nie, maar ook as gevolg van slegte infrastruktuur. Klein-skaalse vark eenhede het gewoonlik goedkoop varkhokke met onvoldoende bevoering, mure, en dakke en baie min van die eenhede het genoegsame vars water gehad. Nog 'n probleem wat ondervind is, was die slegte groei van die varke wat direk gekoppel kan word aan die voeding van die varke. Meeste van die voer het bestaan uit kombuisvullis omdat gebalanseerde rantsoene beskou was as te duur, terwyl daar oor die algemeen 'n te kort was aan toegang tot verskaffers en vervoer (van beide voer en varke na die mark). Nog 'n groot probleem wat geïdentifiseer is deur die produsente was dat daar 'n tekort is aan wetenskaplike hulp van die Regering. Meeste van die produsente het ook genoem dat hul 'n mentorskapprogram sal verwelkom asook hulp met bemarking en befondsing. Nie te min, die varkeienaars het almal aangetoon dat hul graag met die varkboerdery sou wil aangaan en dat met die regte hulp sou hul suksesvol kan wees.

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Dedicated to my family, in particular to my parents, wife,
brothers and sisters.



Acknowledgements

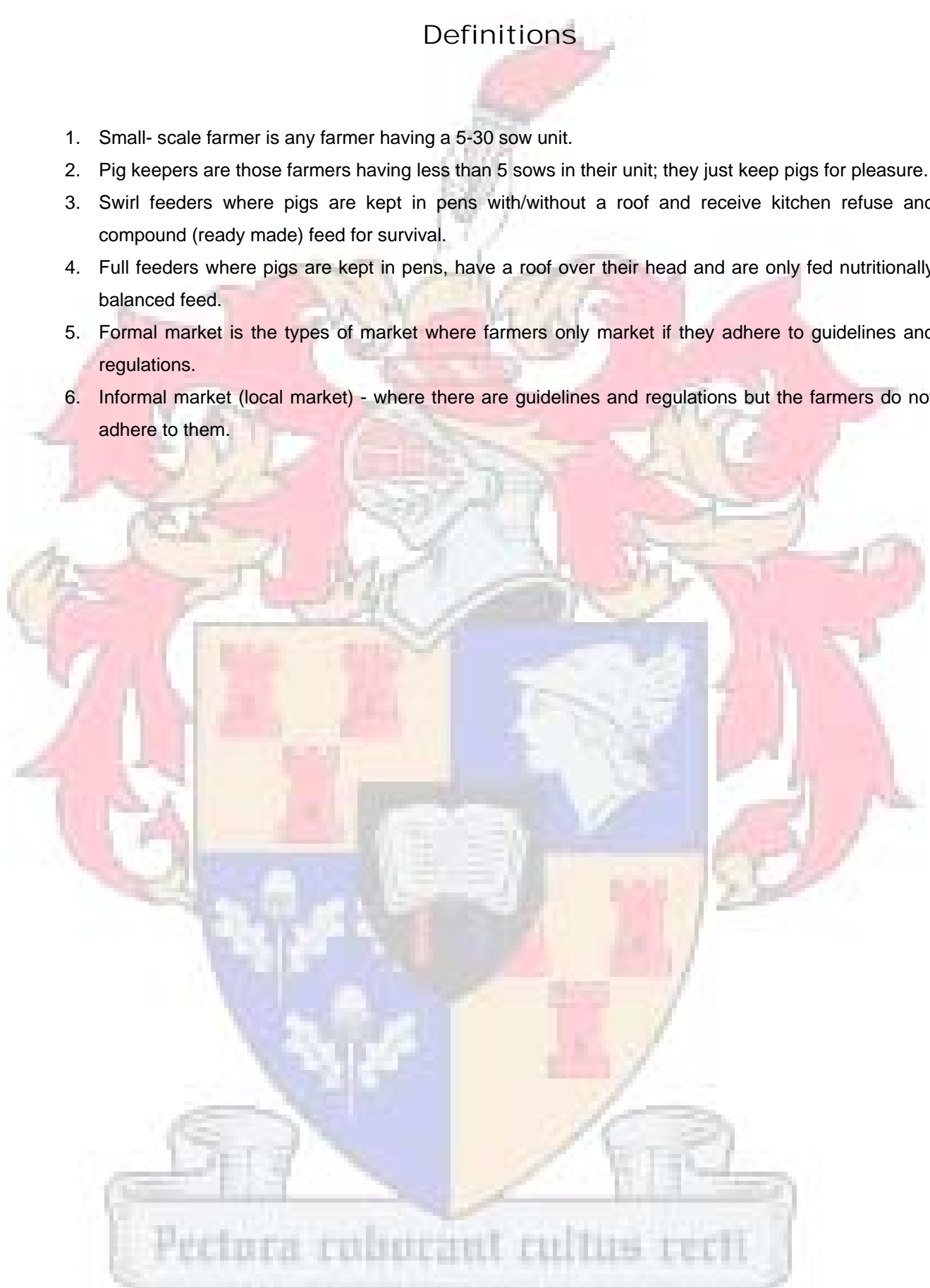
I would like to take this opportunity to express my gratitude to my supervisor, Prof. L.C Hoffman, he was very patient in advising me on how to write a scientific report and the correction thereof. I would also like to thank the following institutions and people:

- SETASA for sponsoring me to accomplish my MPhil degree.
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- My word of thanks also goes to the following: Ms. A. Botha, Ms. G. Jordaan, Dr. H. Lambrechts and all the friendly and helpful staff of the Faculty of Agriculture University of Stellenbosch.
- Pig project members for allowing me to visit their projects.
- The owners of EAS PORK piggery- Mr. and Mrs Raath for giving me an opportunity to spend six weeks on their farm thereby gaining practical exposure to a commercial piggery and not forgetting my mentor at EAS PORK, Mossie de Kock.



Definitions

1. Small- scale farmer is any farmer having a 5-30 sow unit.
2. Pig keepers are those farmers having less than 5 sows in their unit; they just keep pigs for pleasure.
3. Swirl feeders where pigs are kept in pens with/without a roof and receive kitchen refuse and compound (ready made) feed for survival.
4. Full feeders where pigs are kept in pens, have a roof over their head and are only fed nutritionally balanced feed.
5. Formal market is the types of market where farmers only market if they adhere to guidelines and regulations.
6. Informal market (local market) - where there are guidelines and regulations but the farmers do not adhere to them.



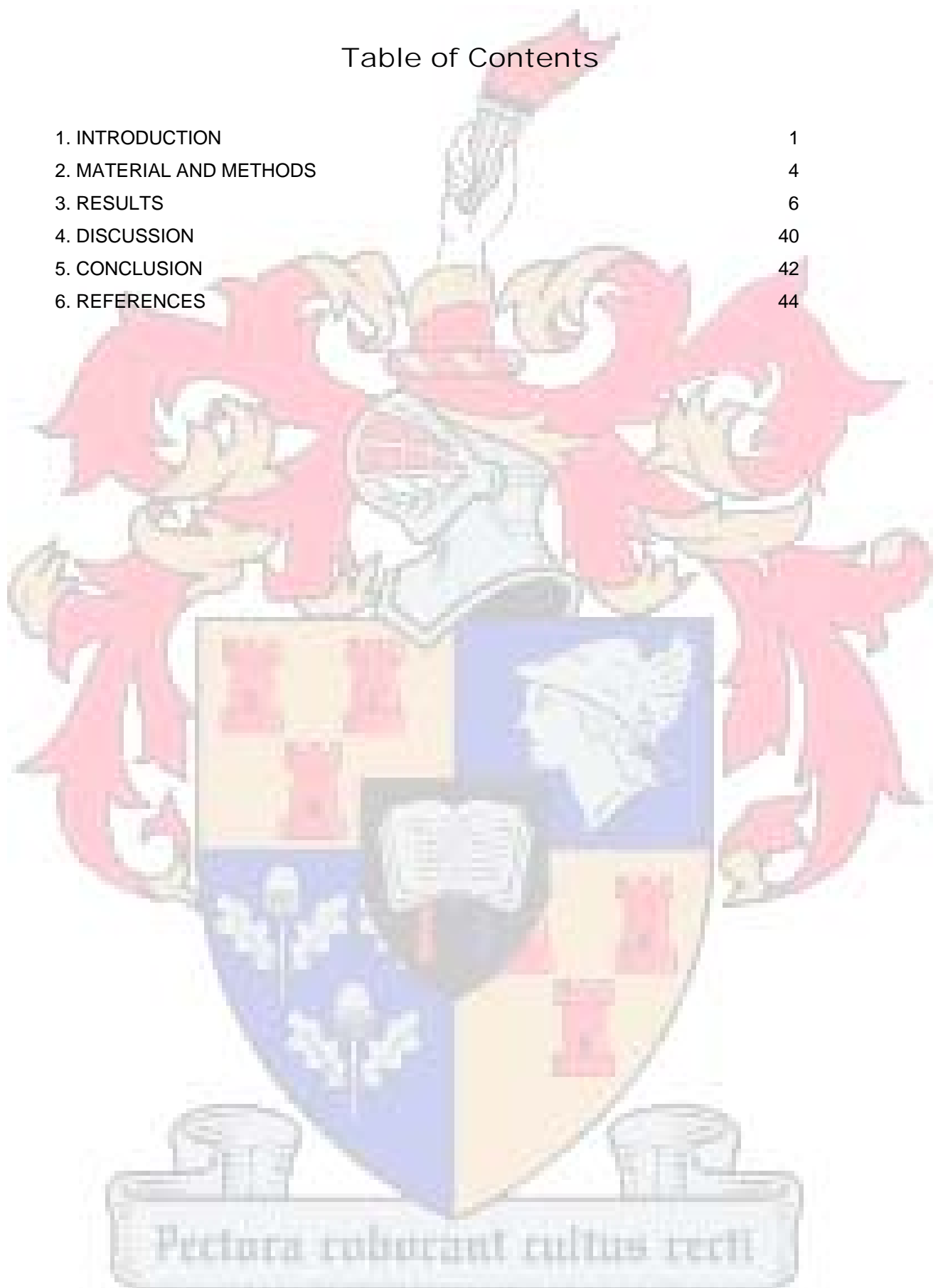
List Piggeries

1. Mokhudu
2. Mukansi
3. Disoloane
4. Roman Catholic
5. Makua
6. A re thushaneng
7. Masemola
8. Baloyi
9. Baloyi
10. Bapela
11. Manganyi
12. Mahlare
13. Kotla
14. Matsepe
15. Hlatswao
16. Manny C.M.K
17. Rekgonne
18. Manasoe
19. Itsosheng
20. J.D.P (Kgoedi)
21. Tlokwe
22. Makofane
23. Itsosheng multipurpose (LRAD)
24. Mogadima
25. Legolaneng
26. Malapane
27. Kgaphola
28. Mokganyetsi
29. Monyebodi
30. Kgopaneng
31. Duno



Table of Contents

1. INTRODUCTION	1
2. MATERIAL AND METHODS	4
3. RESULTS	6
4. DISCUSSION	40
5. CONCLUSION	42
6. REFERENCES	44



INTRODUCTION

The pig industry in South Africa consists of a commercial intensive sector and an extensive sector mainly associated with small scale farmers. Commercial production takes place on approximately 350 commercial farms. Forty percent of these farms operate on 40-150 sow units with the rest having 400-2500 sow units. In total it is estimated that the national South African pig herd consists of 110 000 sows in commercial farms and 20 000 sows in the small scale farmer sector (Limpopo Department of Agriculture, 2004). Pig production projects are used as an alternative to broiler production in the Limpopo Province as a solution to food security problems. If these projects are well managed they can also contribute to job creation. Suitable breeding pigs are scarce in this area; this leads to sound commercial and replacement policies not being adhered to. The reality is that small scale farmers' farm with breeding pigs of poor quality, as they have to buy what is readily accessible/affordable to them. This is in contrast to one of the priorities of the National Department of Agriculture, which is to help farmers to farm with improved livestock (Limpopo Department of Agriculture, 2004). The focus of this discussion is to evaluate practices in commercial farms which can be used to address the shortcomings of small scale farmers.

Pigs produced commercially in Limpopo Province are marketed on contract to abattoirs or in the open market. Contract prices are set on a three monthly or annual basis and are based on input costs while open market prices fluctuate according to supply and demand. In Limpopo Province there are 84 registered abattoirs, although only three of those abattoirs slaughter pigs.

Access to the market is a big challenge to small scale farmers. For example, Makhuduthamaga municipality (one of the Municipalities in Limpopo) has a number of pigs under extensive farming systems, but the markets (such as auction and abattoirs) are approximately 120 km away and the farmers have no means of transporting the animals to these (Limpopo Department of Agriculture, 2003). International factors also influence the price that pork producers, both the commercial as well as the emerging farmers, receive (Makube, 2005). The prices that the producers receive are also not always market related, for example, a stronger rand forces the international prices of pork to be lower (Makube, 2005).

Other challenges faced by the small scale producer are related to the production requirements of pigs. Pigs need to have access to water for their metabolic processes and water is also required to clean the pens. In most of these units, their pigs get water only twice/day, in the morning and in the afternoon. In some piggeries pigs get water every second day i.e., if they were given water on Saturday; they will get water again on Monday. This retards the growth potential of the pigs. Feed suppliers are also situated in the towns and most of the emerging farmers are in rural areas where they do not have the means to transport the feed. Small scale farmers are also not organized, if they were to form co-operatives, they could for example, access finance from banks, have a stronger negotiating presence as pertaining to feed purchase or pig marketing, etc.

Pigs need a cool and dry environment and piglets need to be kept warm (Van Niekerk, 2005). Cold, wet conditions are the cause of diarrhea, pneumonia, poor growth and deaths. Piglets have only 14% of body fat at birth, thus they are poorly insulated against cold (Van Niekerk, 2005). However, most of the infrastructure (especially to keep the new born piglets warm) of the small scale pig farmers is insufficient.

In order to overcome some of their difficulties they (small scale farmers) are farming with crossbreds (Large White crossed with Landrace, was very popular in South Africa). One of the reasons for using First filial generation (F1) hybrids is the fact that they are more hardy and tend to have a higher fecundity than normal purebred breeds. More piglets born and weaned per sow will increase the income of the production system and as a result the profit will also increase. Incorrect conditions in the farrowing house will reduce the number of piglets weaned – a major problem is piglets dying as a result of cold. Agalactia and stress may also be the cause of piglet mortality (Chabo *et al.*, 2000). By 2007, sow productivity in commercial farmers had increased from about 18.0 to 27.73 piglets per sow per year (Davies, 2007 personal communication).

The most important factor in pig production is the ability of the sow to produce and wean the maximum number of piglets and the second factor is to spend less money on feed costs. One of the major production costs of any piggery is feed costs. Currently in some commercial piggeries the feed conversion has decreased from 4.5 to 3.5 feed/kg lean meat produced (Davies, 2007). Malnutrition is also one of the important problems in small pig herds (Department of Agriculture, 2004). This can be corrected by giving them the right type and quantity of feed. (2003). In hot conditions, feed intake also declines, and to a lesser extent, milk production will decline in order to avoid an excessive increase of body temperature. The reduction of milk yield in hot conditions could be related to the decrease of voluntary feed intake and the associated reduction in nutrient availability for milk yield and synthesis (Reanadeau *et al.*, 2003). This phenomenon is particularly rampant in the Limpopo Province where environmental temperatures are high (above 35°C in summer) and the pig housing is inadequate to provide the necessary cooling.

The presence of mycotoxins (a secondary metabolite of fungi) in the feed could result in a reduced availability of nutrients to the pig and subsequent growth depression and increased susceptibility to diseases. This negative effect can also be exasperated due to a reduced feed intake. The negative effects of the fungus can be inhibition of metabolic processes such as protein synthesis, nutrient absorption, toxicity, etc. (Swamy *et al.*, 2003). This fungus typically grows on feed when the storage conditions are not ideal (Swamy *et al.*, 2003).

The above is only a short overview of factors that are known to influence the productivity of any commercial pig production unit. Unfortunately, our knowledge of the production conditions and parameters of small scale pig farming/production units in South Africa is sorely lacking and urgently needs to be benchmarked. Only when this has been done, can the industry, government, NGO's and other role players' start implementing strategies to address all the shortcomings.

Pectora robustant cultus recti

A background discussion that explains the area of the Limpopo Province, the total population of its major cities and marketing activities of pigs will act as departure point for the discussion. The material and methods utilized to collect the data will follow the background. The data was collected by questionnaires, site visits and telephonic interviews. A sample of farmers was selected to be interviewed on a personal one to one ratio. The findings of the data collected which is the results will follow the material and methods section, pictures, tables and text will be used to present the results. After presenting the result they will be discussed, a conclusion will follow the discussion and at the end there will be list of references.

Aim of this investigation.

Very little data exists of the state of South Africa's emerging pig producers as pertaining to their production criteria. The aim of this study is to quantify the production systems and performance of small-scale piggeries in the Limpopo Province. Production problems experienced by farmers will also be evaluated and possible solutions will be suggested. To be able to compare the production performance of these small scale pig farmers, an analysis of the performance of the commercial pig industry in South Africa was first required.

Background

Limpopo is the third largest province in South Africa, having an area of 123 900 km². The population is estimated at around 5 360 000. It has four main cities namely Polokwane, Mokopane, Tzaneen and Phalaborwa. It has no harbours; main airports are found in Polokwane and Mokopane. The main economic activities in Limpopo are Agriculture, Mining and Tourism. In the agriculture sector, livestock production is a major activity. Most livestock activities include game farming and cattle ranching. Due to the high environmental temperatures and the distance to the feed sources (maize production areas) and markets, the intensive livestock production systems (poultry, pig and dairy) are not as well developed as in other provinces. Limpopo Province has the highest economic growth rate of all the Provinces in South Africa (Moloto, 2005). The provincial economy increased from R31bn in 1995; to R72bn in 2002. The average economic growth from 1995 to 2002 was 4%, compared with an average national economic growth of 2.8% in the same period. Although African Swine fever is endemic to the region, it does not pose a serious threat in the Limpopo province to the commercial pig farmers as stringent regulations to control/inhibit it, such as adequate enclosures, are adhered to. It was once reported in 1998 at Mokopane (one of the big towns in Limpopo province), 20 pigs died and 7 pigs were destroyed (Veterinary services annual report, 1998).



MATERIALS AND METHODS

The information obtained from the emerging pig producers was by means of a questionnaire (Addendum A) that was filled in during on-site visits. Additional information was also obtained by means of telephonic interviews.

Only those piggeries having 5-30 sow units were selected and their owners or members of the projects were interviewed. Piggeries were selected with the help of Agricultural extension officers from all over the four districts of Limpopo Province (namely Waterberg, Sekhukhune, Vhembe and Capricorn). After receiving the questionnaires, piggeries were grouped according to the number of sows in each unit. Factors investigated include marketing of pork or pigs, housing, feeding, medication, breeding and management practices.

For the information on the commercial sector, no National statistics were available. Data was therefore obtained from TOPIGS, Charles Street Veterinary Consultant and other Veterinary consultants. It should be borne in mind that as these are all consultants working in the pig industry sector, the data may be biased.

The data on the commercial piggeries were obtained from the following companies: TOPIGS –commercial line (Mr. Francois du Toit), Charles Street Veterinary Consultant and Veterinarian- Animal Production Consultant (Dr. Peter Davies), Pig Consultant –Dr. Peter Evans.

Topigs is a breeding company producing a commercial pig line. One of their breeding goals has been to improve the survival of piglets. They aim to breed a sow which can produce a high number of piglets and have the ability to wean them.

Dr. Peter V A Davies has a Veterinary-Animal consultant company based in Waterkloof, Pretoria. He provides technical service to commercial pig farmers around South Africa. He supplied information on the production parameters of commercial pig farmers.

Charles Street Veterinary Consultant is a company of Veterinary Consultants and animal scientists providing services to commercial farms. They provide services such biosecurity issues, management and pig health. Monthly visit are made to the farms and emergency visits in case there is an urgent need at the farm. They also present talks at study groups when there is a need. They issue a document every year indicating the average litter size, number born alive, number born dead, number weaned etc. in the commercial piggeries they consult in. They also indicate the best and the worst performing piggeries. This is helpful as commercial farmers can evaluate their performance relative to that of other pig producers.

Dr. Peter V.A Davies operates from an office in Waterkloof, Pretoria. He gives advice to farmers in the Gauteng and Limpopo provinces.

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It is generally believed that stud breeders will outperform commercial breeders. However, the fact that commercial breeders frequently use F1 sows (with their well documented higher fecundity and mothering ability) while stud breeders use purebreds should not be overlooked.

Commercial farms normally have good management practices; they have boar, farrowing, dry sow, gilt, weaner, grower and finisher houses. Some have a facility for mixing and storing of feed. Provision is also made for a room to store the raw materials and the feed. Some use artificial insemination to serve their females. There is a changing room for workers to change clothes when they report for duty. Their pig gets a well balanced diet and there is frequently an animal feed consultant who visits the farm to give advice on feeding and ration formulation of the feed for the pigs. There is also a routine visit by a Veterinarian to advise on pig health matters and reproduction of pigs.



RESULTS

After obtaining all the data, the results were grouped in the following manner:

- 3.1 General
- 3.2 Regional constraints
- 3.3 Description of small scale piggery facilities,
- 3.4 Feeding strategies of small scale farmers,
- 3.5 Management programs in small scale piggeries,
- 3.6 Production parameters of small scale piggeries in the Limpopo province
- 3.7 Production parameters of commercial line and commercial piggeries
- 3.8 The management strategy in a commercial piggery.

3.1 General

Thirty one piggery projects were interviewed and these piggeries were grouped into three groups. The first group consisted of those piggeries having less than five members, the second group has more than six members and the last group is owned by individuals.

Most of the piggery projects interviewed consisted of unemployed youth, disabled people, women and men who had organized themselves into groups and formed these projects. Piggeries were owned by either individuals or groups or organization or co-operatives. Those owned by individuals have either the husband or wife or the son as the owner and employed 1-3 people. Others used their grandchildren to assist in the running of the farm. Members of the organization or groups or co-operatives all have equal ownership as well as management inputs; their labour force is normally the farmers themselves. Twenty one of the respondents mentioned that they lack training (Figure 1).

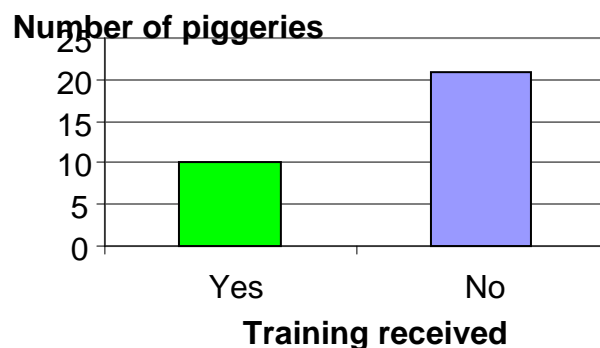


Figure 1. Relationship between response on training undertaken and number of piggeries

Training is one of the most crucial factors influencing the profitability of their business. Similar to commercial farms, emerging farmers farm with cross-bred pigs. The majority of farmers have 6-9 sow units (Figure 2).

Crossbreeding produce F1 mothers which can result in an increase in the number of piglets born per litter. The contributing factors to the higher number of piglets born are as a result of the higher ovulation rate. The end product of breeding F1 pigs is F2 sows; this is normally done in small scale piggeries when the farmers select their own replacement gilts. F2 sows have been noted to produce two piglets less than the F1 sows (du Toit, 2007).

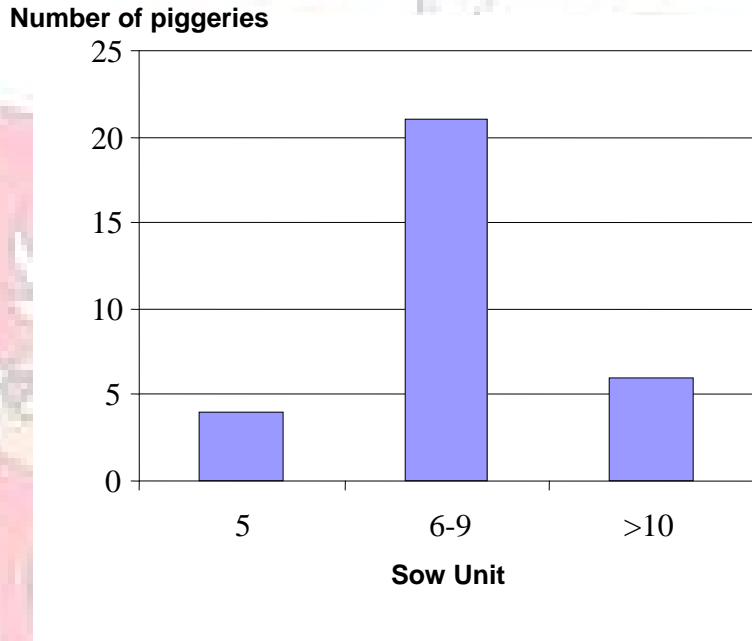


Figure 2. Relationship between the sow unit size and number of piggeries interviewed

Twenty two piggeries are owned by individuals (Figure 3). It seems as if most farmers in this group are interested in working with pigs. Piggeries owned by groups lack total commitment of members, some come late to work or do not report for work at all.



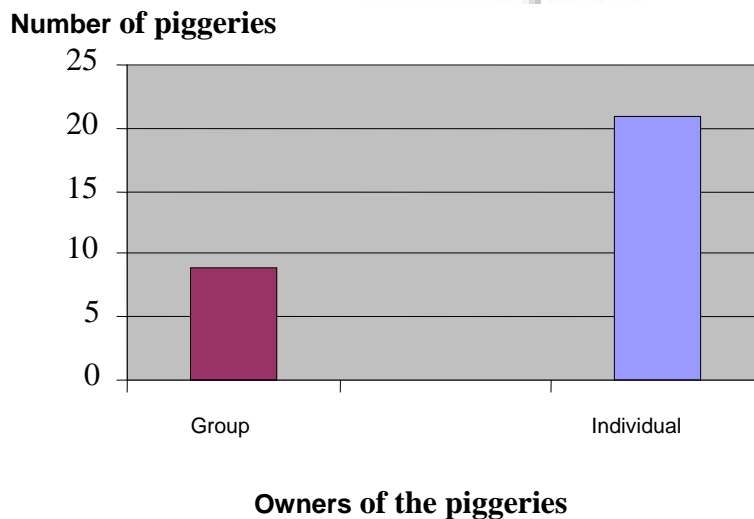


Figure 3. Relationship between numbers of piggeries and owners of piggeries

Small scale farmers interviewed in Limpopo Province have obtained their land either through Permission to Occupy (PTO) from their traditional leaders, via the Land Redistribution for Agricultural Development (LRAD), by means of the Settlement Land Acquisition Grant (SLAG) programs.

The following section is on the regional constraints faced by the Agricultural extension officers who are meant to advise and help the emerging farmers.

3.2 Regional constraints

Lack of co-ordination between animal health and Agricultural Extension officers contribute to projects being unsustainable. An animal health technician has a three year diploma and has been taught about animal diseases, treatment and their control. Agricultural Extension officers have been trained on methods of transferring skills and knowledge to the farmers and also on sharing of knowledge and skills amongst farmers and the extension officer. The Agricultural Extension officer and the animal health technician often service the same farmers but they never talk to each other on job related issues. It was also evident that the Agricultural Extension officers do not have the necessary knowledge and skills to help the farmers. An Extension officer responsible for animal production (they are now being called Agricultural advisory officer) is an official who has attained a Bachelor of Science degree in animal science, or a Bachelor of Agriculture honours in animal production, or a Bachelor of Technology specializing in extension. On the other hand, Agricultural extension officers have a diploma in agriculture with Extension as their major subject and an Animal production technician would have a diploma in animal production or a Bachelor of Agriculture degree.

Another issue raised in the discussions with the producers was the lack of Extension officers responsible for animal production, Animal production technicians and Agricultural extension officers as well as their level of experience and expertise. Animal production contributes 51% to the agricultural contribution of the Limpopo

Province; the remaining 49% comes from horticulture and agronomic crops. The staff compliment of Extension officers responsible for animal production is very low (50 in 2007) in the whole province (including six districts and 26 Municipalities). This includes people working at head office, agricultural training centers and agricultural development centers (formerly called research stations). If this number is divided by the number of municipalities excluding head office, agricultural training and development centers, it means each municipality will have two Extension officers responsible for animal production. Government officials need to establish partnerships with the local commercial farmers. These commercial farmers are more than willing to work with small scale farmers.

The next section is a brief explanation of facilities of small scale piggery.

3.3 Description of small scale piggery facilities

The pigs are housed in a wide range of facilities from full earthen floors using low cost building material, to more modern facilities containing cement floors and running water. The following figures (Figures 4-10) show typical housing and management practices and give a good indication of the infrastructure and systems utilized. The constraints of each are typically a lack of cement floor, bedding material and shade (these are self evident as displayed in the figures). Figure 4 indicates a typical example having a large ground area with a small cement floor.



Figure 4. Some pig houses have a small concrete floor and a large earthen floor area.

During summer, the water should be kept in the shade (although this is not always done) (Figure5).

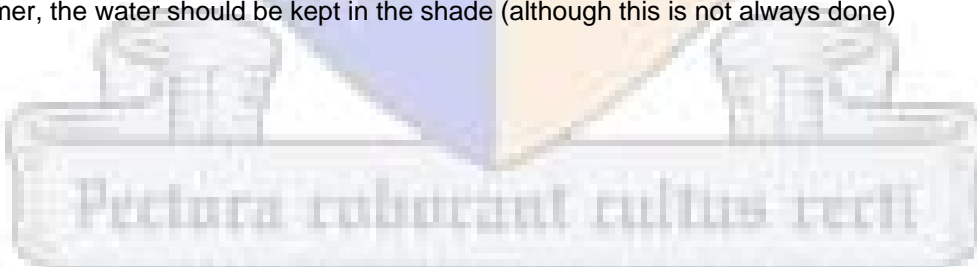




Figure 5. Feed and drinking water troughs placed on the earthen floor (note that this photo was taken at midday as indicated by the shadows, yet there is no water for the pigs in the troughs).

The pigs should not be allowed to move around in the community as they can come in contact with diseases or spread diseases to other pigs in the community (Figure 6).



Figure 6. Some piggeries have a wire fence.

Pigs should not be exposed to direct sunlight and winds, as this will cause stress. When sows or gilts are exposed to high environmental temperatures their libido, fertility and conception rates decrease, the same applies to boars.

Pectora roburant cultus recti



Figure 7. Pigs are kept in areas with no shade.

The main aim of the provision of a farrowing facility in a piggery is to reduce the mortality of piglets but the welfare of the sow should not be ignored. The small scale farmer must try to balance the requirement of the two groups of pigs at their different production stages. The pen of the piglets should have a creep area, bedding material and a dunging area, those are sometimes overlooked in small scale farmers. Piglets need bedding material as they are born with only 14% of body fat. Their bodies cannot generate sufficient heat to keep them warm. External heat sources or insulation from environmental temperature extremes is normally not catered for in small scale farms (Figure 8).



Figure 8. In most of the piggeries, no bedding material for the piglets is provided.

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Exposing pigs to unfavourable environmental conditions like sunlight and cold winds can retard their growth rate. Some piggeries have better structures to keep their pigs warm during the winter and cool during the summer (Figure 9). As the air openings are small (500 cm) this can cause problems in ventilation as less air will come into and circulate through the house. Ventilation methods should be such that it avoids overheating of the pigs.



Figure 9. Some of the pig sties have partial shade and others have complete shade.

Of the thirty one piggeries evaluated, twenty three have no running water (Figure 10) and only eight have boreholes on their farms. In any pig production system there should be enough water supplied for the health of the pigs and their welfare. Drinking troughs of about 300 mm width should be provided for 20 finishing pigs (Pigs Code of Welfare, 2005). As pigs drink more water in hot weather; the farmer should refill the drinking troughs when they are empty during the day.

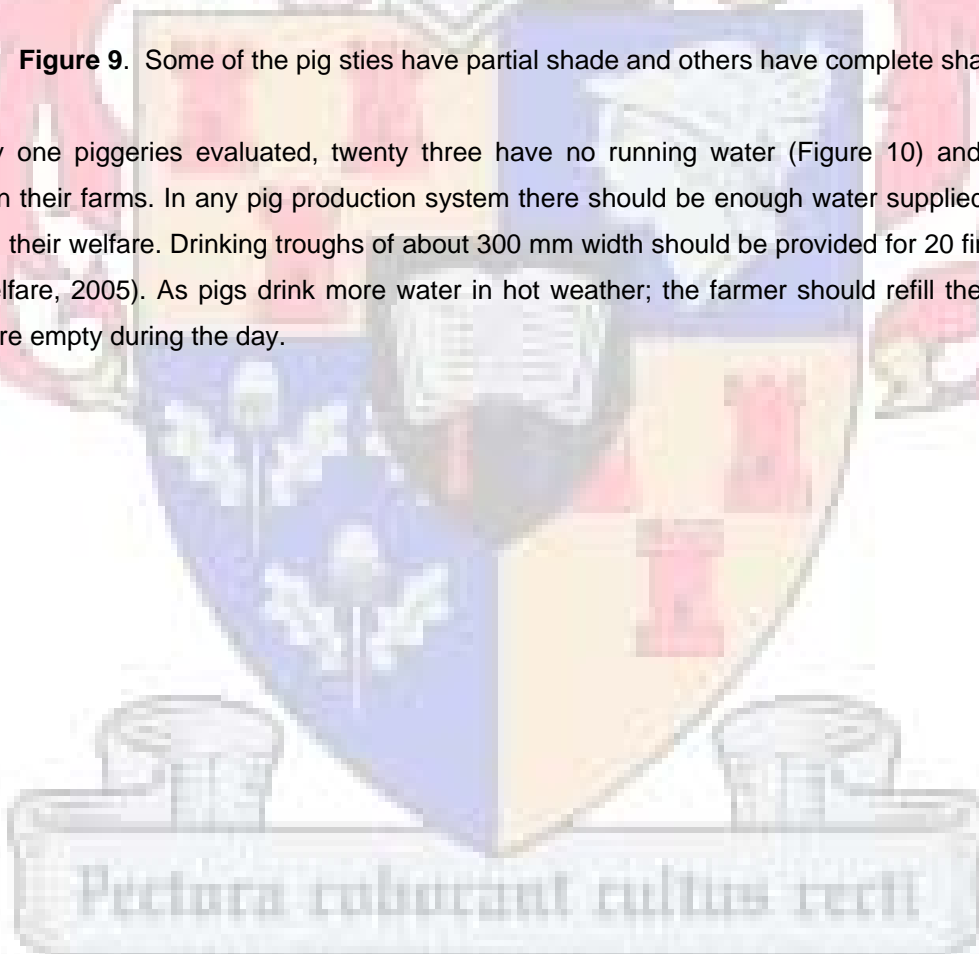




Figure 10. Hand delivered water being poured out for pigs to consume.

However; the water is frequently insufficient thus causing the animals to suffer excess stress (Figure 11). Weaker piglets will sometimes not have access to water at all, thus causing their growth to be retarded and it will not normally be economic to maintain these pigs in the system.



Figure 11. Insufficient drinking space and insufficient water supplied resulting in the piglets fighting for water.

The next section examines the pig feeding strategies employed by the small scale farmers.

3.4 Feeding strategies of small scale farmers.

The way in which small scale piggeries feed their pigs differs; some piggeries feed pigs twice per day, every day whilst others feed their pigs every second day. If pigs receive their feed on Saturday they will get their next meal the following Monday. This normally happens in those piggeries feeding their pigs' kitchen refuse from hospitals and boarding schools.

Feed given to the pigs varies according to the piggeries and could be kitchen refuse or wasted food from social gatherings, wheat bran, pig grower (a commercial concentrate), and/or yellow maize (Figure 12). The way the pigs are fed also varies according to the knowledge and experience of the owner or group. For example, some feed their pig's only kitchen refuse, and/or a commercially available wheat bran, and/or pig grower and/or yellow maize. Others mix one bag of concentrate with three bags yellow maize as they believe that it will make the pigs grow better.

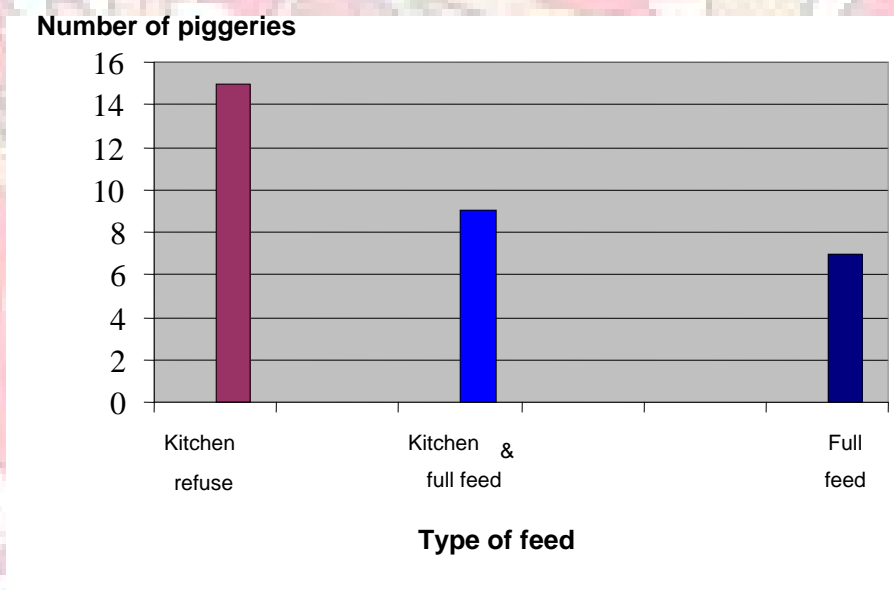


Figure 12. The types of feed used by small scale piggeries in Limpopo Province.

The growth rates of pigs are greatly reduced in these situations. Small scale farmers frequently feed their pigs feed contaminated with fungi. Malnutrition is one of the important problems of small pig herds (Department of Agriculture, 2004). This can be corrected by giving them the right type of feed. In hot conditions, feed intake also declines, and to a smaller extent, milk production will decline in order to avoid an excessive increase of body temperature. The reduction of milk yield in hot conditions could be related to the decrease of voluntary feed intake and the associated reduction in nutrient availability for milk yield and synthesis (Reanadeau *et al.*, 2003).

Results of this investigation indicated that some farmers feed the whole grain diet to pigs as they are not aware of the negative results that may occur. Pigs on a whole grain diet generally maintain lower production levels compared to pigs on a meal diet (Brand *et al.*, 1997). The lactating sows experience a lot of stress in the situations where they get their feed every second day. Piglets need their share of milk every day whether the

mother has eaten or not. This results in the sow utilizing body reserves to produce sufficient milk for the piglets. The situation is exasperated if the sow was in a bad (thin) condition even before farrowing. Personal observation during the on site visits indicated that this was the norm (Figure 13). Small scale farmers are not well informed about the welfare issues as pertaining to their pigs; it is the responsibility of agricultural officials to make them aware of them.

The Code of Pig Welfare of South Africa emphasize that pigs must have freedom from thirst, hunger and malnutrition. Figure 13 illustrates a malnourished sow; this sow will take more than sixty days to conceive. Pig must have the correct ration allowance (2 kg of feed) per day and it must be a balanced diet. The factors which should be considered when determining the ration allowance of a sow are the age and state of health of the animal, the nutritional composition and quality of the feed, and the previous ration allowance. If the sow looks too thin, the ration allowance should be increased, it is best to feed the sow according to its body condition. Reproductive inefficiency may be associated with back fat depths of less than 12 mm, but there is also a negative effect in the sow achieving more than 25-30 mm back fat depth (Surndorff, 2004).



Figure 13. A sow showing severe signs of malnutrition.

Generally, under nutrition is more of a problem observed amongst the small scale famers. Kitchen refuse is not a balanced diet for pigs, and during the site visits it was observed that the coats of the pigs depending on this type of feed were often rough (Figure 14).

Pectora robustant cultus recti

It is also preferable that no tools, and/or objects be brought into the pen as they might cause injury to the pigs and thus adversely affect the welfare of the animals. In Figure 14 there are pieces of steel pipes and bricks in the pen.



Figure 14. Pigs do not receive sufficient and or balanced ration and are in a poor condition. Note all the foreign objects lying in the pen – all these could injure the animals and should be considered as welfare risks.

3.5 Management programs in small scale piggeries.

Few of the small scale piggeries had any formal management programs. This is partly due to insufficient advice from the extension officers as well as from insufficient infrastructure. An example is the housing of sows and boars together (Figure 15).

Some of the respondents noted that when the boar is housed together with the sow for a long period, the boar will become exhausted to such an extent that its level of libido drops and the boar will not be interested in the sow, even when she comes on heat. There is also frequently no weaning and breeding strategy, the sow weans itself and the boar may mate when he wishes. When a boar and sows are housed in one pen the small scale farmer will not have any mating targets for each week and month. This creates further problems as the farrowing pens will sometimes be overcrowded. The two main factors in achieving mating targets are detection of heat signs on sows and gilts and making sure that effective mating takes place. It was noted that when the sows are kept with the boars for a long period, the sows are frequently over stimulated and will not show standing heat.

Pectora roburant cultus recti



Figure 15. Boars housed in the same pen as the sow through out.

Small scale farmers believe that the dung from cattle are free from diseases and can provide warmth to piglets immediately after birth (Figure 16). Therefore the pregnant sow is kept in a cattle kraal during the last days of its pregnancy. The kraal is then used as a farrowing pen; this exposes the piglets to unfavourable environmental conditions such as cold and high temperatures. The kraal manure might also have micro-organisms such as bacteria or fungi which will cause diseases to the piglets. In those situations it will also not be easy to disinfect the navel cord.

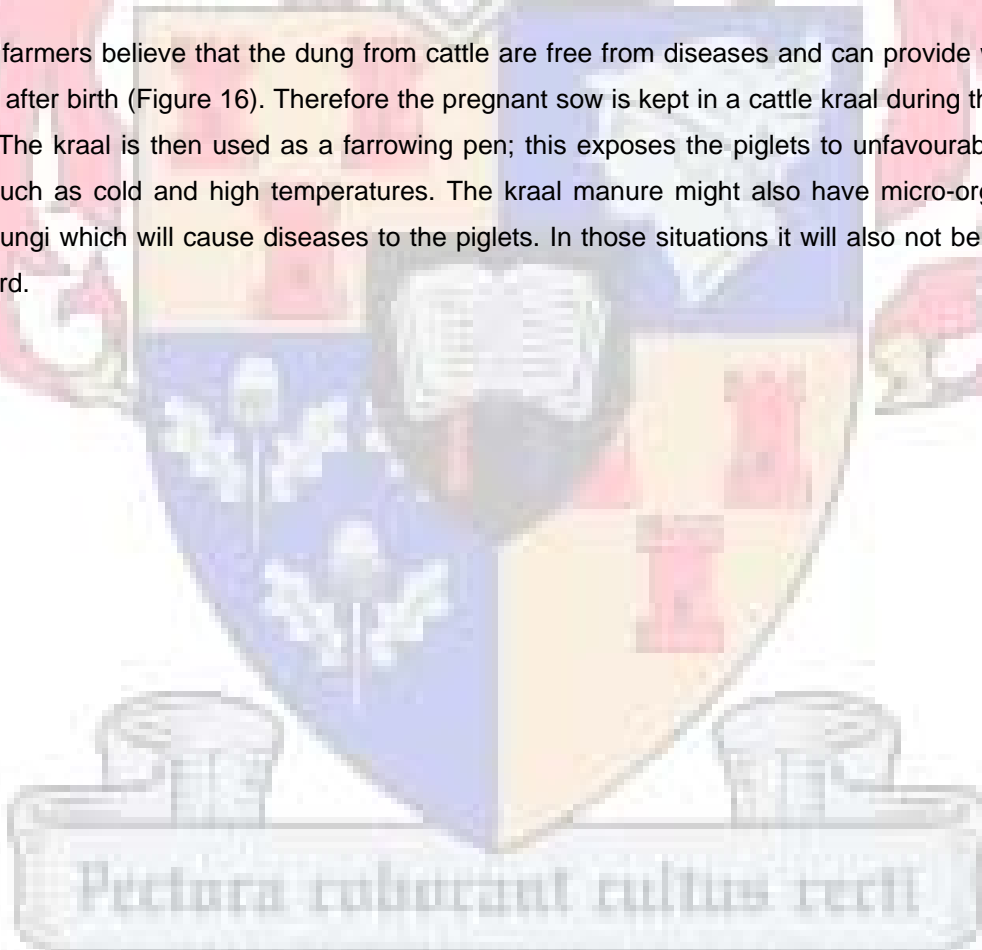




Figure 16. This sow is due to farrow in a few days time and is being kept in a cattle kraal.

One of the most important factors overlooked by many of the small scale farmers is that piglets need to be kept warm. Piglets cannot produce their own heat at birth, by keeping the piglets warm they will not use their body reserves or nutritional components derived from their feed to generate heat, but rather use the nutritional energy/amino acids for growth.

The housing together of pigs in different production stages (Figure 17) may cause frequent fights during feeding. The pig will compete for feed and water, which will result in the young pigs getting insufficient/less feed and water. The farmer will also be unable to set the exact date for marketing his/her pigs. Some piglets are housed together with the adult pigs and the competition for feed and water could result in fighting and some pigs will sustain injuries and wounds. The wounds then become a potential source of infection of various diseases.

The diet composition of weaners and growers are not the same as they are in different growth and development stages. When they are mixed as in Figure 17, the diet and ration allowance of one of the groups (normally the weaners) is sometimes compromised.





Figure 17. Weaners and growers are housed in the same pen

3.6 Production parameters of small scale piggeries in the Limpopo province.

In Table 1 the general productivity of the various small scale piggeries are indicated. An interesting phenomenon is that as the number of sows increase, the management program improves resulting in better production efficiency.

In Table 1, there is a clear indication that with increases in the number of sows per unit, piglets' mortality decreases. The farmers become more committed in their management practices and they are willing to learn from other farmers. Better management is practiced in piggeries having 5 five members or individual ownership. From the personal interviews it was noticed that when there are more than 5 five members, not all the members are committed to work.

The mortality amongst the pigs of the small scale farmers is high due to many factors such as lack of bedding material, rails for sows in the farrowing pens to prevent the sow from lying on the piglets. A number of these factors have already been discussed and are visible in the Figures.



Table 1. Productivity of sows (<10 per unit) in small scale farmer systems

	5 sows	6-7 sows	>7sows
1. Piglet Mortality	40%	30%	20%
2. Open days	30 days	10 days	10 days
3. Lactation length	60 days	28-60 days	28- 60days
4. Pregnancy period	115 days	115 days	115 days
5. Farrowing interval	205 days	153-185 days	153 -185 days
6. Litters/year	1.78	2.3 - 1.97	2.3-1.97
8. Housing	No bedding material and heaters for piglets	No bedding material and heaters for piglets	Provide bedding material to piglets
9. Marketing	They market their pigs at the abattoir, auction and informal market	They market their pigs at the abattoir, auction and informal market	They market their pigs at the abattoir, auction and informal market
10. Number of piglets born/sow/year	7-10	9-12	9-12
11. Number of piglets weaned/sow/year	4-6	5-7	5-8
12. Age of gilts and boars at first mating	12 month	12 month	12 month



Piggeries having five or individual ownership but also having more than five sow units, produce 1.74 litters per year whilst the others produce 1.5 litters/year. As less piglets are produced this will lead to less piglets being weaned. Most of the small scale farmers are unaware that the open period should be 3-5 days. In cases where the sows are too thin, the open period can be longer, because the sow will take a longer time to recover its body condition. This seems to be the major reason for the long open period noted. The reason for the poor condition of the sows is the fact that the farmers do not feed their sows a balanced diet.

An analysis of the responses from the farmers as pertaining to their marketing strategy (Figure 18) indicates that they use three main methods of marketing: selling to an abattoir, selling locally and informally or selling at live animal auctions. Twenty six of the small scale piggeries send their pigs to the informal market. The reason given for using this market is that they have no transport or money to hire a truck. Their clients pay and then collect the pigs on farm.

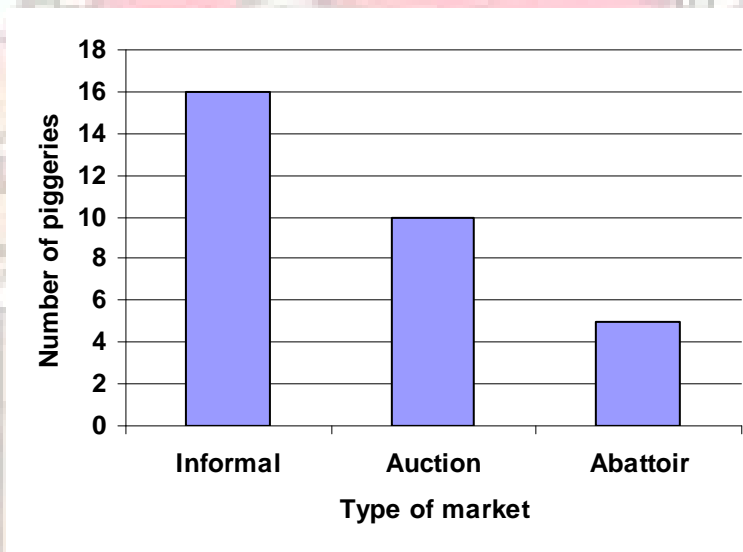


Figure 18. Marketing strategy practiced by the small scale pig producers in the Limpopo province.

The following is a short explanation of the various marketing strategies followed:

a. Informal market

All the piggeries sell pigs to the local people on request. The veterinary public health department should advise them on the use of an approved slaughtering facility and handling of meat and waste – however, this is not always done. Sometimes people organize themselves into a group (those people who eat pork) and buy one pig at R400-500, depending on the size of the pig. The pig is then slaughtered at their own place. Some clients ask the project members to slaughter the pigs.

All the piggeries interviewed indicated that they slaughter pigs on site and sell the pork. During the process of slaughtering a man will stand in front of the pig while other (2-4) men will hold the hind legs, the man in front will hit the pig on the head with an ax or hammer. This is not in line with the code of conduct for pigs as they should not be exposed to pain during slaughter. Stunning of pigs is not done. The carcasses are then cut into pieces of

about one kilogram. There is no attempt to try and cut the pieces into formal cuts as defined in the commercial scenario. There are also no cooling facilities; although the meat may be taken to freezers. Members of the community will come and buy pork at approximately R10 per kg. This is the most profitable marketing process, because one pig can produce 100 cuts if her live weight was 150 kg. They will get \pm R1000 from one pig.

b. Live Auction

In Figure 19, pigs from a small scale farmers are shown in the auction facilities whilst those pigs in Figure 20, are from a commercial farmer. Those pigs coming from the small scale farmers are dirty and thin whilst those coming from the commercial farmer are clean and well fed.

Pigs will be offloaded into the holding pens at the auction site and the owner will then register them with auctioneers. The auctioneers will announce the starting price (such as R200 for each pig weighing 50 kg live weight). Interested buyers will rise up their hands. Auctioneers will increase the price until there is only one hand up and this buyer will then buy the pig on that final price.



Figure 19. Pigs from a small scale farmer in the auction pens

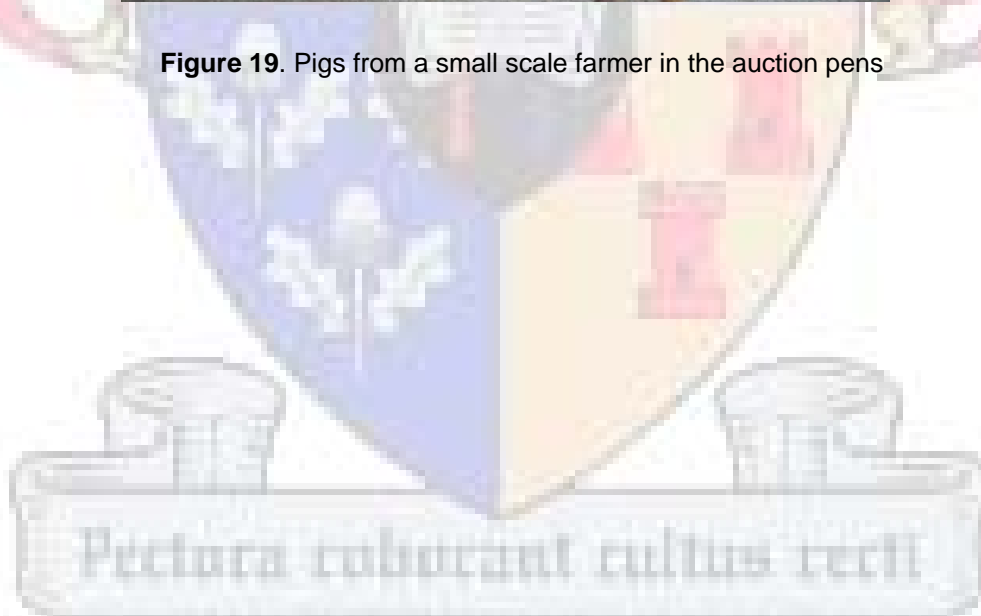




Figure 20. Pigs from a commercial farmer in the auction pens

c. Marketing at the abattoir

This marketing strategy looks promising (a large number of respondents indicated that this is where they would like to market their pigs) but it requires the management to keep records of the medicine used as this will be required during marketing. Pigs are sent to the abattoir at approximately 85 kg live weight. Firstly the veterinary surgeon examines the pigs and submits a health status report on the pigs; this report will be submitted to the abattoir during delivery of the pigs. The money will also be deposited directly into the organization/farmer's account.

3.6 Other factors noted during the site visits

The following are some general comments addressing some of the observations made during the site visits. Although some of these have been touched on during the earlier section of this discussion they are mentioned again as these observations are of such a nature that they warrant further discussion.

Pigs of small scale farmers are exposed to various stressors, for example, the housing conditions are not ideal. Husbandry practices, feeding and nutrition (Close, 2005) and (or) various environmental stresses can greatly influence the wellbeing of animals (Piva *et al.*, 2002). One of the most important factors identified as an impediment to the successful farming of the pigs on a small scale is the insufficient feeding of balanced feed. Pigs are also housed in large groups that lead to fighting and as a result feed intake is reduced. Where there is insufficient feed, the larger pigs will get and consume most of the feed at the cost of smaller pigs.

In some of the piggeries investigated the pigs are exposed to high environmental temperatures. Environmental effects can also have an influence on the growth of pigs. Pigs which are kept in areas of environmental

temperature $>33^{\circ}\text{C}$ consume less feed and consequently grow at a slower rate than pigs maintained in areas with environmental temperature of 23°C (DeRouclay, 2003).

Farmers must always be encouraged to keep the pen clean, to avoid the situations as depicted in Figure 21. A dirty environment may be the breeding ground of diseases and it will become costly to the farmer to get rid of the diseases.



Figure 21. The diagram showing a typical farrowing pen with an accumulation of faeces.

There is a wrong perception amongst the farmers that pigs need a dirty environment or pens (Figure 22). This belief needs to be addressed.



Figure 22. A typical farrowing pen showing accumulation of faeces and dirt.

Pectora tabulant cultus recti

It must be noted though that some of the small scale piggeries do keep weaners and adult pigs in clean gravel pens (Figure 23). The weaners look happy under those environmental conditions and these farmers also reported lower incidences of diseases.



Figure 23. Weaners in their clean, sand filled pen.

Figure 24 is a good example of total number of piglets weaned per sow. In this case there are eight weaners, although this number is below that expected in any commercial intensive system, it does indicate that with the proper housing and management systems, the small scale farmers can improve their productivity.



Figure 24. Healthy weaners in their pen

During this investigation, training was given to some farmers by officials from the training centers (Figure 25). As mentioned, this was indicated as an urgent need by most of the farmers interviewed.



Figure 25. Demonstration of handling of piglets by animal production technician

Of the 31 piggeries evaluated only four have a loading ramp (Figure 26). This is a cause of concern as carcasses of pigs injured during the process of loading to the market get lower prices. The risks from bruises should cause down grading in situation as described.



Figure 26. Loading ramp used by Small scale farmers

The next section is a brief explanation of the production performance indicators in well establish commercial pig farmers.

3.7 Production efficiency of synthetic line and commercial piggeries.

The small scale farmers need to adopt the production practices of commercial farmers if they wish to improve their production. The commercial farmers have knowledge on the nutritional requirements of their pigs as can be demonstrated by their inclusion of additional amino acids such as lysine, and vitamin and mineral premixes etc in

the diet fed to their pigs. Emerging farmers normally feed their pig on only one type of raw material such as wheat bran or yellow maize or just kitchen refuse.

During this section, the production practices of commercial producers are described and where applicable, compared. The synthetic line and other pedigree breeders use purebred pigs - both female and male. They are concerned with the genetic make up of an animal. Fewer piglets are born per sow by these "pure bred" lines/breeds than that of the commercial breeders. Growth rate of pigs in synthetic line stud herds is normally lower as compared to growth of pigs in commercial breeder herds. Commercial breeders are concerned with producing more pigs which can grow rapidly. The shorter period to marketing means the farmer spends less money on feed costs and the fixed cost per pig slaughtered is also less.

To obtain this information, a study of the records of the various commercial and synthetic line breeders was conducted and the relevant data extracted. The objective of this exercise is to try and get an indication where the production bench marks could be for the small scale pig farmers.

The data portrayed in Table 2 is derived from the records of synthetic line at Topigs in Pretoria, and that in Table 3 from records supplied by Dr. Peter VA Davies of their commercial breeder clients.

Table 2. Production parameters of synthetic line stud breeders (Average) (du Toit, 2007)

Litter /year	Piglets born alive /year	Piglets born dead /year	No. of Piglets weaned	Weaning weight (kg)	Pre-weaning Mortality (%)	Post weaning mortality (%)	FCR	Age of boar at First mating (weeks)	Age of gilt at first mating (weeks)	Rating
2.2	23.0	1.3	22	6.5	12	3.5	4.0	35	35	Poor
2.35	25.1	2.35	23.6	7.2	10	2.5	3.7	30	30	Average
2.38	28.0	0.8	26.4	7.5	7	1.5	3.6	30	30	Good
2.4	27.0	0.7	26	8.0	5	1	3.4	30	30	Excellent



Table 3. Production parameters of commercial pig breeders (Average) (Davies, 2007)

Litter /year	Piglets born alive /year	Piglets born dead /year	No. of piglets weaned	Weaning Weight (kg)	Pre-weaning Mortality (%)	Post weaning mortality (%)	FCR	Age of boar at first mating (weeks)	Age of gilt at first mating (weeks)	Rating
1.8	18.0	0.9	16.2	6.0	10	8	4.5	42.8	30	Poor
2.2	23.32	1.1	20.52	6.8	12	6	4.0	42.8	30	Average
2.3	25.76	1.15	23.70	7.8	8	4	3.8	38	30	Good
2.35	27.73	1.17	26.34	8.8	5	2	3.5	38	30	Excellent

The information contained in these two Tables is useful in comparing the production performance of the small scale farmers to that of commercial farmers. The aim is to have small scale farmers graduating to the performance level of commercial farmers.

The number of piglets weaned by commercial producers on average is 23.7 compared to 20.52 of stud breeders. There is a positive relationship between the total number of piglets born and the total number of piglets weaned. A sow producing 27.73 piglets /year weans approximately 26.34 /year compared to a sow producing only 18.0/year and weaning 16.20 piglets /year in the commercial herds. There has been an improvement of two pigs born and weaned for the top 25% of farms over the past five years (Evans, 2007). In the CSVC Survey of 2004 the average numbers of piglets born were 24.33, born dead were 1.32 and numbers of piglets weaned were 21.87 per annum. In 2005/2006 the average number of piglets born alive was 29.0 and number of piglets weaned was 25.31 per annum.

There is a disparity between larger, medium and small farms; larger farms perform better than medium and small farms. The reasons why this is so is not clear but it may be that the health status in the larger farms are good. These producers have sufficient numbers to warrant more regular visits from Veterinarians.

For the data used to portray a typical commercial pig producer's management strategy, a period of six weeks was spent on a commercial farm monitoring their activities. Additional data was also obtained by analyzing their records. Commercial South African pig farmers normally have well developed infrastructure such as an office, store rooms, change rooms, telephone, water and electricity. They normally buy raw materials and mix feed on their farm or sometimes buy readymade balanced feed from feed suppliers. They tend to use crossbred pigs although the boar is a sometimes pure bred or AI may be used. They would have a contract with an abattoir for the marketing of their pigs.

The next section will look at the valuable experience gained at the commercial farm.

3.8 Production parameters of commercial piggery (Commercial Farm Experience)

The following is a summary of the management strategy as performed at a commercial piggery containing 700 sows. It is argued that as this piggery is run as a successful commercial entity, the strategy applied is similar to that in the rest of South Africa and could be used as guidelines for emerging pig producers.

Boar house

(i) Heat detection

In this production system, natural mating with the assistance of a stockman is used. The sows are divided into three groups according to their reaction to the vulva stimulus:

Group 1

These pigs withstand pressure of the hands on their back without the presence of a boar. They will be inseminated in the afternoon of that day or the next morning. If they are standing for either a man or boar they will be inseminated within ± 2 hours.

Group 2

These pigs withstand pressure of the hands on their back only in the presence of the boar. They will be inseminated on the next day in the afternoon – these sows must be standing for ± 3 tests.

Group 3

They show heat signs but do withstand pressure on their back in the presence and without the presence of the boar. These groups of pigs are mated the next afternoon/morning. At least two boars are used as changing the boars assist in solving the problem of potential infertility in one of the boars. There is also a slight increase in litter size when the sperm from two boars are mixed during the mating cycle.

During natural mating, the assistant ensures that the penis penetrates the vulva, as some boars need assistance. The ejaculation is examined to ensure that the semen plug is present after mating.

The following procedures are followed for checking heat signs:

- Press the pig at her back
- Stimulate vulva
- Tightness of the flanks or sides
- Position of the ear/eyes
- Tail up
- Hair erect

Pectora robustant cultus recti

(ii) Pregnancy test

This is done 24-25 days after the sow was inseminated or mated with a boar. An Ultrasound scanner instrument is used which shows the presence and movement of the foetus in the uterus. This specific producer has a good conception rate: where 55 sows were tested (29/11/2005), three were found to be empty and the remaining 52 were pregnant.

(iii) Pregnant sows

The dry sows are kept in the boar house for at least 35 days; from there they will be transferred to the pregnant house. They are moved to the farrowing house at least seven days before farrowing.

(iv) Back fat (P2) measurement

During the whole production cycle of the sow, various back fat depth measurements are taken to ensure that she is in the correct condition so as to maximize her production potential. These measurements are taken using sonar, at the following periods:

- Pre-farrowing (FP2), seven days before farrowing.
- Pre-weaning (WP), two-three weeks before the sows are moved into the boar house.

The amount of balanced feed fed will be adjusted accordingly; if the sow is too fat, the ration allowance is reduced, if the sow is too thin, the ration allowance is increased.

Boar replacement

Generally the boar is replaced every second year. The reasons for replacing the boars are infertility, old age and injuries of the legs.

Gilt replacement

The following gilt replacement strategy is followed on the commercial farm: 14 gilts are selected every 3 weeks to join the breeding sows. The gilts are selected from the farm, based on the following criteria:

- Mothering ability of the mother
- Bred in the genetic pool, they produce some of their own breeding stock (Line 30 is for slaughter and line 80 is for breeding).
- Growth rate of the piglets
- Condition of the piglets during suckling

The management program of the gilts is as follows:

- The gilts are numbered at 24 weeks of age.
- Heat signs are recorded from 24 weeks of age.
- The gilts are removed from *ad lib* feeding, and only fed once per day with a boar and sow ration.
- They will be mated or inseminated at 210 days of age or 30 weeks of age.

- A P2 measurement is taken on the day the gilts are put into the boar house. Gilts enter boars house at week number 27 and will be mated (inseminated) at week number 30-31.

Farrowing house

The following management steps are followed in preparing the sow before farrowing:

- The sow is moved slowly ensuring that she does not overheat or stress when being handled.
- The sow is washed (use soap if available) all over.
- The sow is injected (in the neck) to control internal parasites.
- Thereafter the sow is moved into her crate in the farrowing pen.

Farrowing

The stockman in the farrowing house ensures that the infrared lamp is working and places it in the creep area to warm the piglets. It provides heat which attracts the piglets, thereby helping to avoid squashing of the piglets by the sow. There is a roof over the creeping area to prevent draughts and to keep the heat inside. The infrared lamp will be kept burning for two days where after it is be removed. The heaters for the piglets in the creep area are monitored regularly to ensure that they are in a working condition. Bedding material is also spread in the creep area.

The sow is fed according to its P2 back fat depth measurement. She is also fed a pre-farrowing mix to assist in her bowl movement.

The sow is assisted by the stockman on duty in case of problems during farrowing. A record of the time she starts to deliver the first piglet is kept and if she releases only one/two pigs and then stops for 30 minutes, it means she needs to be assisted.

Steps in assisting the sow:

- Before assisting a sow in case of dystocia, check the lying position of the sow, she should lie on one of her sides (she should lie down in a nursing position). If she is not in that position, rub your hand on her teats; she will then lie down into the correct position.
- When the sow is showing signs of difficulty in giving birth inject oxytocin, and wait for 15 minutes. Oxytocin help the sow's uterus contract.
- Put on plastic gloves and pour lubricant on your hands. Place your hand inside the uterus and pull the piglets out one by one. Wash the membranes from the snout of the piglet.
- Disinfect the umbilical cord using disinfectant. This will prevent infection through the umbilical cord. It also minimizes the risk of joint infections.
- Make sure the piglets get colostrum within two hours after birth. Colostrum contains antibodies which will give piglets immunity against diseases. In addition to antibodies colostrums contain carbohrates, proteins, fat and water, they are important for the metabolic process of the pig.

On day three after birth, the following management practices are done:

1. Tattooing: an instrument with the name of the farm registered mark is applied on the ear of piglets and tattooing ink is rubbed on the ear. This owner identification is a legal requirement.
2. Ear notching: an ear notcher is used to make notches on the ear according to the week of the year (if it is week number 48, notches will be made for that number).
3. An Iron injection is given to the piglets to supplement the iron from the mother's milk as they are kept on a concrete floor. This is given to supplement the intake and strengthen the function of the liver and kidneys. Iron supplement is used, for the prevention and treatment of iron deficiency (anemia) in piglets. It is administered intramuscularly in the neck, just behind the ear.
4. Coccidiostats is given to piglets if they show signs of diarrhea to prevent coccidiosis.
5. Tail cutting is done to avoid cannibalism. Only two thirds of the tail is cut.

Treatment of the sow after birth.

The sow is given antibiotics to prevent any infection which might have occurred during farrowing. The sow is also given vitamins to boost its immunity.

Weaning

Before weaning the following are checked:

- The weaners' house must be clean,
- feeders and drinkers must be in a working condition.
- Feed and vaccines for piglets and weaners must be available in storage.

The sow is taken to the boar house 28 days after farrowing when the piglets are weaned and thereafter the piglets are removed from the farrowing house. This is normally done on a Thursday and the sows will then be inseminated the next Tuesday. Sows are given feed (3 kg) at weaning in the farrowing house. Thereafter, they will be given another 2 kg in the boar house. The next day they will get 3 kg of feed.

In a number of commercial pig production systems in South Africa, an all in-all out weaning system is used. In such a system, the weaning week is every third week. Litters of the sow that give birth in the same week are housed together although the young boars and gilts are housed separately. They will remain in their specific pens until they are moved into the grower pens. Weaners are moved to the grower pen at 7-8 weeks of age. Pens are cleaned and rested for one week before being filled with the next batch of weaners.

Vaccination of weaners

Piglets: they get vaccinated by means of an intramuscular or subcutaneous (behind the ear in the neck) injection at weaning followed by another three weeks later. Vaccine is used to prevent and control pneumonia caused by Strains of *Mycoplasma hyponeumonia* infection in pigs. Alternatively, piglets should be given a vaccine intramuscularly or subcutaneously at five to seven days of age and again at 23 to 28 days of age.

Feeding

These commercial farmers (as do most commercial farmers in South Africa) buy commercial feed and also mix some nutritionally balanced diets on farm. As these farms are large enough, they negotiate feed process with the feeding companies – a factor that the emerging pig producers cannot do as they do not consume the volumes of feed that the commercial farmers do. Frequently, as a part of their client service, commercial feed companies frequently have trained pig scientists who consult with their clients on pig husbandry and management matters.

So as to maximize productivity, commercial pig farmers feed a series of different feeds, balanced according to the pigs growth stage and specific requirements. For example, the young piglets are fed a creep feed that is fed *ad libitum* from 10 days of age to 2 days after weaning (for a 28 day weaning period), with a minimum intake of 700 g per piglet. This specific production unit feeds three different formulated diets from weaning to marketing. There are also specifically formulated diets for the dry sows and boars, another for the gilts as well as a lactating sow diet. The adult animals are not fed *ad libitum* but rather amounts determined by their body condition (fat depth) or the number and age of the piglets during the lactation period.

Marketing

Marketing is done at a live weight of between 91 – 100 kg. Pigs are weighed before they are sent to the abattoir. They are transported very early in the morning so as to minimize heat stress. Pigs are marketed in Gauteng and in Polokwane in the Limpopo Province.

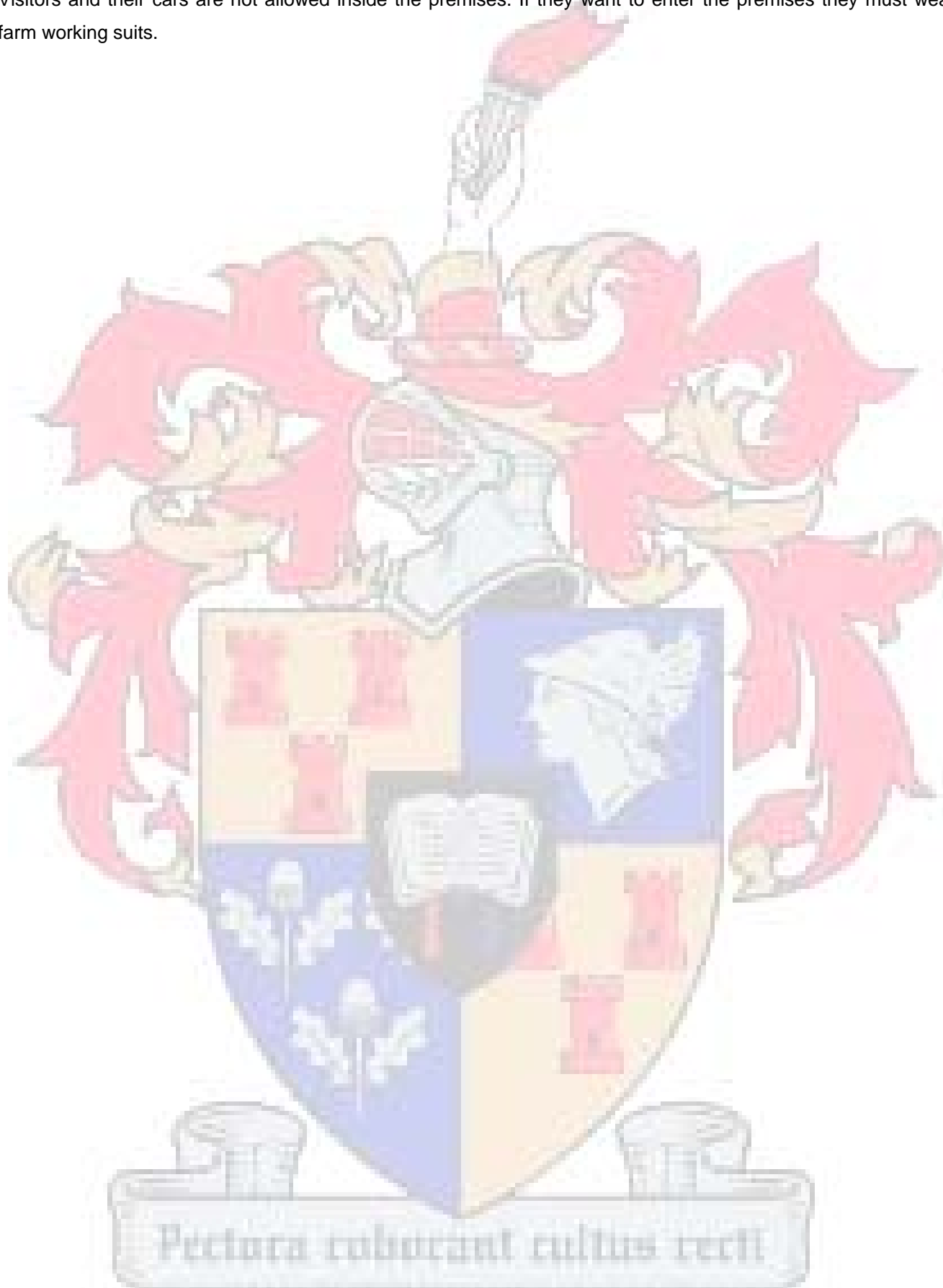
Bio-security

Bio-security is very important in the pig industry because if ignored, the producers and government will spend huge amount of money in trying to treat the diseases. Government has spent close to R2million (R1 454 000 for compensation and R500 000 for logistical expenses) in compensation and logistical expenses during the past five years (Phillips, 2006). There were three serious setbacks in the pig industry in the past five years (Robinson, 2006). These were Foot and Mouth disease in Kwazulu-Natal, Porcine Reproductive and Respiratory Syndrome (PRRS) in the Western Cape and Classical Swine Fever (CSF) in the Western and recently in the Eastern Cape. The CSF was last reported in the country in 1918 (Phillips, 2006). The spread of the diseases is through pigs, people, vehicles, feed, other animals, water or birds (Phillips, 2006). That is also the added cost of decreased production/reproduction in the herd due to disease outbreaks.

At this commercial farm, all workers disinfect their shoes before entering the change room. At the change room they change clothes (they wear working suits and gumboots). The working suits are washed on the farm. When they leave the change room they disinfect their gumboots, change clothes and wash their hands. Workers in charge of the farrowing house must also disinfect their shoes at the door of the farrowing house before they enter. The suckling piglets are most susceptible to diseases and therefore this facility is managed as a high risk zone.

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Visitors and their cars are not allowed inside the premises. If they want to enter the premises they must wear farm working suits.



DISCUSSION

From discussions held with the farmers it is clear that the farmers lack ownership in projects. They think that the Agricultural extension officers or Animal production technicians own their projects; they are unable to take major decisions such as to decide on when to market their pigs or buy feed. It is also impossible for these staff to service the whole province effectively and efficiently. This problem is exacerbated by the lack of co-ordination between the animal health and Agricultural extension officers which contributes to small scale piggery projects being unsustainable as these officers are meant to provide the sorely needed information on pig farming. The small scale piggeries must also establish formal and informal contact with commercial piggeries as they will be able to get more knowledge on production procedures as well as easier access to the different marketing channels for pigs. Some emerging farmers have gone through the Government's mentorship programs and they now market their pigs at the abattoir. The mentorship program is a three years period and it is a process of moving the small scale farmer away from subsistence to commercial farming. During the mentoring process the commercial farmer works closely for maybe two to three years, with small scale farmer. The commercial farmer trains the small scale farmer on the management of pigs through the different production stages until marketing. Thereafter the commercial farmer will withdraw gradually until the small scale farmer is on his/her own.

Mentorship has also helped farmers in having contact with feed and breeding stock suppliers. They have been taught the basic knowledge on mixing feed at their farm and management of pigs. None the less, feed cost is the major cost in any pig industry including that of small scale farmer. Farmers have access to raw materials like yellow maize, Soya bean, Lucerne etc, they just needs to be taught on how to mix them manually (ration formulation), that will not only improve performance but will also reduce some of the feed costs. Storage of the feed on farm is also an issue that warrants further training. The type and quality of feed will also affect the sow productivity; the pig must get feed without mould, as mould can produce poor growth in sows (Swamy *et al*, 2003).

The farrowing house should also have bedding material as piglets are born with low body fat. They must be kept under a warm environment for them to grow rapidly and avoid cold stress. If piglets are exposed to a cold environment they will take longer from weaning to reach the correct weight for the market. Under commercial conditions, additional heating is provided to the piglets in the farrowing house by means of heaters, lamps etc. However, this method is not appropriate to small scale farmers as most do not have any electricity. Correct designs of piglet shelters, use of straw in these shelters, etc., will help alleviate this problem.

Pectora roburant cultus recti

CONCLUSSION

Production of small-scale piggeries is low due to lack of the following; water, electricity, housing, access to inputs such as feeds and medicines. Similarly, a lack of advice/training also hampers the productivity of the farming units. Another challenge faced by small scale farmers is lack of access to market and breeding stock.

Pig production efficiency can be improved by adhering to the following management practices:

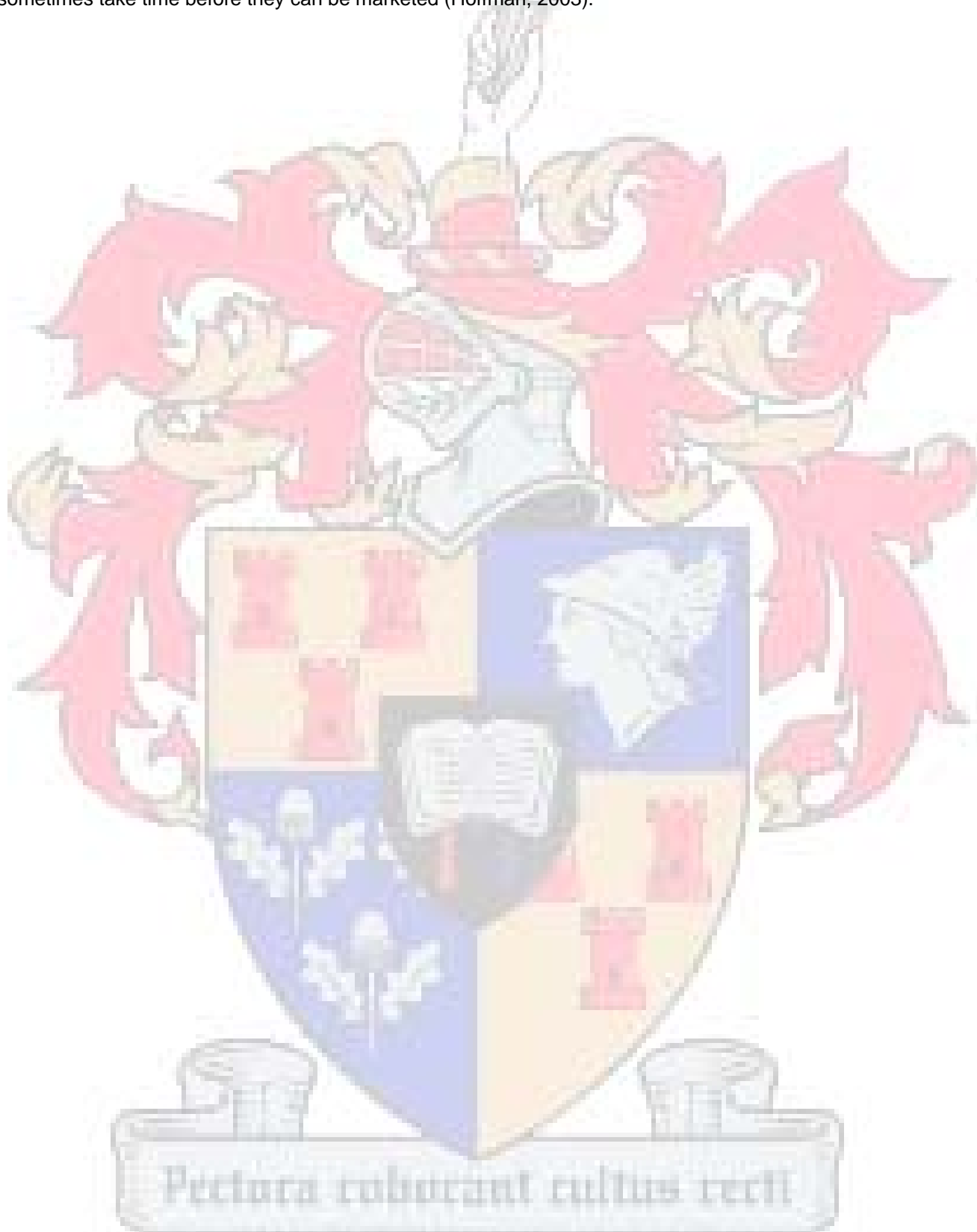
- Disease control.
- Providing shelter for pigs.
- Providing bedding materials for piglets.
- Providing balanced diets.
- Avoid feeding pigs rotten feed (as some feed have clear signs of fungi).
- Separating boars from sows (have days for mating)
- Control lactation to between 28 and 35 days.
- Reduce open periods to between 3-5 days.
- Establishing marketing channels, especially to abattoirs.
- Establish constant supply of quality breeding stock.
- Establish better mechanism of purchasing feed and medicines.

The Department of Agriculture in the Limpopo province should make sure that farmers are trained in the management of pigs, record keeping and financial management. The Department should also try to establish a team spirit between the Agricultural extension officers, animal production and health technicians. The Agricultural training centre should produce more (at least 100 pigs/year) pigs for resale as breeding stock to small scale farmers. Further research needs to be done by the Limpopo Department of Agriculture on small scale farmers and their needs.

Farmers need on farm training on management of pigs. The Department of Agriculture should train and employ Agricultural Extension officers who are willing to work. The Department frequently sends the officials to training, but some of these officials have no interest in the training and therefore after the training, they do not implement the knowledge and skills gained.

The farmers need access to products and services; this can only happen if the Department can provide communication, funding and entrepreneurial development support. The Department should make conditions conducive to private sector involvement; they should assist emerging farmers and improve extension services. The Department of Agriculture should review their strategic plan to look into possibilities of increasing their Animal Scientists especially along commodity groups such as Monogastric animals (Pig production). Presently, the Department of Agriculture lacks competent officials in Pig Management.

Organization such as SAPPO (South African Pig Producer Organisation) are in a good position to give support to small scale farmers through training, linking small scale farmers with commercial farmers and feed suppliers. Some of the piggeries resemble that of free-range housing systems but in a free-range system, pigs may sometimes take time before they can be marketed (Hoffman, 2003).



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Pectora laborant cultus recti

QUESTIONNAIRE

A. Technical data (Management)

1. What type of pig breeds do you farm with?

Duroc	
Landrace	
Largewhite	
Other (Specify)	

2. How many sows are there in the herd?

3. How many piglets are there in the herd?

4. How many gilts are there in the herd?

5. How many boars are there in the herd?

6. How many growers are there in the herd?



7. At what age do you wean your piglets?

8. How soon after weaning, do you mate again?

9. At what age do you breed you gilts?

10. At what age do you breed your boars?

.....

11. What is your replacement policy?

.....

12. What is your culling policy?

.....

13. Where do you buy your breeding stock?

.....

14. Do Agricultural Extension officers provide you with relevant and technical Production advice ?

Yes		
No		



15. How would you rate your Agricultural extension officers in terms of the Following service they are providing:

	Poor	Fair	Good
1. Farm management (farm planning, maintenance and general management)			
2. Community development (facilitator of development)			
3. Economic aspects (accessing finance)			
4. Viability and sustainability (solution to problems)			

Project name	Year started
1. Itsosheng piggery	
2. Manasoe piggery	
3. Legolaneng piggery	
4. Hlatswago piggery	
5. Matsepe piggery	
6. Manny C.M.K piggery	
7. A re thushaneng piggey	
8. Mahlare piggery	
9. Disoloane piggery	
10. Roman Catholic piggery	
11. Matlala piggery	
12. Ledwaba piggery	

Project name	Age of manager/owner			
	18- 25	25- 35	35- 45	>45
1. Itsosheng piggery				
2. Manasoe piggery				
3. Legolaneng piggery				
4. Hlatswao piggery				
5. Matsepe piggery				
6.Mannya C.M.K piggery				
7. A re thushaneng piggery				
8. Mahlare piggery				
9. Disoloane piggery				
10. Roman Catholic piggery				
11. Matlala piggery				
12. Ledwaba piggery				

Project name	Educational level(Grade)			
	3	3-7	8-10	
1. Itsosheng piggery				
2. Manasoe piggery				
3. Legolaneng piggery				
4. Hlatswao piggery				
5. Matsepe piggery				
6.Mannya C.M.K piggery				
7. A re thushaneng piggery				
8. Mahlare piggery				
9. Disoloane piggery				
10. Roman Catholic piggery				
11. Matlala piggery				
12. Ledwaba piggery				



Number of people employed

Project name	Gender	
	Males	Females
1. Itsosheng piggery		
2. Manasoe piggery		
3. Legolaneng piggery		
4. Hlatswao piggery		
5. Matsepe piggery		
6. Manny C.M.K piggery		
7. A re thushaneng piggery		
8. Mahlare piggery		
9. Disoloane piggery		
10. Roman Catholic piggery		
11. Matlala piggery		
12. Ledwaba piggery		

B. Health plan

1. Do you have health plan (disease control programme).

.....

2. If yes, what the are the most important disease s you control/prevent/at your Piggery?

.....

3. Explain in detail steps you follow in controlling/preventing diseases.

.....

4. Explain in detail your vaccination program.

.....



5. Explain in detail your method of controlling internal parasites.

.....
.....
.....
.....
.....

C. Housing

1. What is the number of sows pregnant?

2. What is the number of furrowing pens?

3. What is the number of pens for boars?

4. What is the number of pens for weaners?

5. What is the number of pens for fatteners?



D. Marketing plan

1. Where do you market your pigs?
.....
2. How many pigs do you market?
.....
Monthly.....
In 3 months.....
In 6 months.....
In 12 months.....
3. At what age do you market your pigs?
.....
4. What is the price per/pig?
.....
5. Do you have promotion plan?
.....
6. How do you get your pigs to the market?
.....
7. What is the distance between your project and market?
.....
.....

E. Feeding

1. What type of feed do you feed your pigs?
2. Where do you purchase your feed?
.....
3. The feed ,your pigs receive is in :

Dry matter basis	
Wet form	
4. What is the quantity of feed fed to your pigs per day?
.....
5. What is the quantity of water you fed to your pigs/day?
.....
6. How often do your pigs receive water?
.....
7. What is the source of water to your project?

.....
8. Do you have enough water throughout the year?
.....
.....

9. What is the source of power to your project?
.....

10. What do you use to warm up your piglets during winter/cold days?
.....

F. Training

1. Did you receive training in management of pigs?

Yes	
No	

2. If you get an offer for training what will you like to be trained on?
.....
.....
.....

G. Infrastructure

1. What are the conditions of roads from your main road to the project?
.....
.....

2. If it is a gravel road how often do public works people scrap the road?

Once/month	
Twice/moth	
Once in two months	
Once in three months	

3. What is the distance between your project and market?

.....
.....

4. Will you commend on the process of marketing systems you use
(It can either be marketing of pigs or pork)?

.....
.....
.....
.....
.....

5. What do you use to warm up your piglets during winter/cold days?

.....

6. How did you access land for the project?

.....

7. Do you experience any problems in acquiring land?

.....

8. Any other comments you wish to make?

.....
.....
.....

