SOCIO-ECONOMIC ANALYSIS AND PROFITABILITY OF SMALL-SCALE BROILER PRODUCTION ENTERPRISES IN VHEMBE DISTRICT, LIMPOPO PROVINCE

by

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MINI - DISSERTATION

Submitted in partial fulfilment of the requirements for the degree of

Master of Agricultural Extension

in

FACULTY OF SCIENCES AND AGRICULTURE

(School of Agriculture and Environmental Sciences)

at the

UNIVERSITY OF LIMPOPO

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2015

DECLARATION

I, Mulaudzi Rudzani Grace, declare that mini-dissertation hereby submitted to the University of Limpopo, for the degree Master of Agricultural Extension has not previously been submitted by me for a degree at this or any other University; that it is my work in design and in execution, and that all material contained therein has been duly acknowledged.

Signature …… **Date** ……

MULAUDZI R. G. (Ms)

DEDICATION

This work is dedicated to my mother, Mrs Thifulufheli Emmah Mudau, my daughter Mulaudzi Vhutshilo and my son Mulaudzi Khuthalani.

ACKNOWLEDGEMENT

I want to thank God for His grace and mercy that if it was not His will, this study would not be possible, and the following persons for their respective contribution to this dissertation:

A special thanks to my supervisor, Dr B.J. Mtileni for his tireless guidance, support, encouragement and dedication. My co-supervisor, Prof. A. Belete for his support and guidance. My colleagues in the Department of Agriculture, for their support and provision of information on small-scale broiler production. Vhembe district small-scale broiler producers for their willingness to participate in this study. The Limpopo Department of Agriculture for permission to conduct this study. Limpopo Department of Agriculture Extension Recovery Programme for funding this study. Mr. Makhavhu Nkhangweni for his enthusiastic support and guidance all the way. My two children, Vhutshilo and Khuthalani, for their love and support. My mothers, Mrs Mudau T.E. and Mrs Makumbane L.M. for their unrestricted love, support and guidance all the way. My siblings, Emmanuel, Ndivhuwo, Portia, Phathutshedzo, Ndamulelo and my in-laws for their unconditional love and support. Lastly, my comprehensive family, especially my grandmother Mrs Mulaudzi Ntavhanyeni Johanna for the prayers that she always does for the success of everyone in the family.

ABSTRACT

The aim of the study was to analyse the socio-economic factors affecting the gross margin of small-scale broiler producers in the Vhembe district and thereby determine their profitability and contribution towards the local economic development. The population comprised of small-scale broiler producers who reared between100 and 3200 birds in the Vhembe district. A total of 94 out of 311small-scale broiler producers were selected using a simple random- sampling procedure. Data on different socio-economic parameters was collected through personal interviews using a semi-structured questionnaire. Descriptive statistics was computed using FREQ COUNTS procedures to describe the characteristics of small-scale broiler producers. Gross margin analysis was used to calculate the profitability for small-scale broiler producers. The Multiple Linear Regression was used to estimate the influence of socio-economic factors influence on the gross margin of the small-scale broiler producers. Multiple Regression analysis indicated that small-scale broiler producers in the Vhembe district were making profit. Socio-economic variables such as age of the farmer, farming experience, flock size, training received by the farmer, market access and record keeping, educational level, household income and extension services were found to have positive correlation with the small-scale broiler producers' gross margin. To effectively address production constraints affecting gross margin of small-scale broiler producers, it is, therefore, fundamental to consider their socio-economic profiles.

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ABBREVIATIONS AND ACRONYMS

DAFF	- Department of Agriculture, Forestry and Fisheries
DoH	- Department of Health
FAO	- Food and Agriculture Organization
LED	- Local Economic Development
LEGDP	- Limpopo Employment, Growth and Development Plan
PGDS	- Provincial Growth and Development Strategy
SA	- South Africa
SAPA	- South African Poultry Association
SEDA	- Small Enterprise Development Agency
SPSS	- Statistical Package for Social Sciences
STATS	- Statistics
TEA	- Total Entrepreneurial Activities
USDA	- United States Department of Agriculture
VDLEDS	- Vhembe District Local Economic Development Strategy
VDM	-Vhembe District Municipality

CHAPTER 1: GENERAL INTRODUCTION

1.1 Introduction

Livestock production in general and poultry production in particular play important socio-economic roles in most developing countries (Alders, 2004). Like many other developing countries, South Africa is highly challenged by unemployment, food insecurity and low economic growth. According to Waynne and Lyne (2003), broiler production enterprises were identified as the most effective form of production that creates jobs and improves food security and economic status worldwide. In South Africa, the broiler industry is divided into commercial and traditional production systems. The traditional production system is characterised by village chickens mainly local ecotypes and scavenging with seasonal feed supplements (Addisu *et al.,* 2013; Mogesh *et al.,* 2014), whiles the commercial production systems are characterised by their levels of operation (Mlozi *et al.,* 2001).

The commercial broiler production system is further categorized by different levels, namely, the highly commercial large scale broiler producer enterprises (>50 000 birds), the medium scale broiler enterprises (20 001 – 50 000 birds) and the small-scale broiler enterprises (≤ 20 000) (Moreki, 2011). The South African broiler industry is constituted of a few large broiler producers who account for 80% of the total production while 20 % is attributed to both medium and small-scale broiler producers (DAFF, 2011). Majority of small-scale broiler enterprises have been initiated by groups and individuals and they support the Millennium Development Goal (MDGs) number 1(i.e. eradicating extreme poverty and hunger).

In the Vhembe district, there are efforts to improve the output of small-scale broiler producers and consequently their contribution to household economies. Previous researches to improve small-scale broiler production have merely focused on providing solutions to production constraints such as feed shortage, lack of quality day old chicks, low production inputs, poor and low output, low to minimal bio-security, lack of slaughter facilities, lack of production skills, lack of extension support and weak market linkages (Sebopetji and Belete, 2009; Tshikosi, 2009; Maliwichi, 2010; DAFF, 2011; Munyai, 2012; Tshovhote *et al.,* 2013; LDA, 2013; Ntuli and Oladele, 2013).

It has become a common understanding that knowledge about farmers' socio-economic factors such as gender, age and wealth status of the household head, household size, production system, land size, flock size, housing structures, vaccines and accessibility of extension and veterinary services are crucial in optimising the performance of small-scale broiler producers in the Vhembe district. There is, however, little, if any, literature that describes how the socio-economic factors affect the gross margin, profitability and their contribution towards local economic development of small-scale broiler producers in Vhembe district. Such information is critical in devising appropriate holistic intervention strategies for improving small-scale broiler production in Vhembe district. The main objective of the current study was to analyse how the socio-economic factors influences the gross margin of small-scale broiler producers and thereby determine the business profitability and its contribution towards local economic development in the Vhembe district.

1.2 Problem statement

South Africa has got a challenge of high unemployment rate. The Vhembe district as part of South Africa has an unemployment rate of 53% (Stats SA, 2001). As an attempt of addressing the challenge of unemployment, a number of enterprises which could assist the government in job creation and poverty alleviation have been initiated. One of the initiatives was broiler production enterprises which are operating at the small-scale level, either in groups as cooperatives or individuals at households' level. The challenge with the broiler production enterprises is that they are found to be financially unsustainable, as a result their role in job creation, poverty alleviation and local economic development is not realised. This study therefore aims to describe their characteristics, to determine their gross margins and furthermore to analyse the socio economic factors which affects their gross margins with the aim of recommending the turnaround strategies.

1.3 Motivation of the study

South Africa's agricultural sector is characterised by dualism: a modern commercial farming sector using hired farm workers alongside small-scale farmers, mostly found in the former homeland areas (Agriseta, 2010). Broilers are the main source of affordable protein in both developed and developing countries and are seen as an appropriate vehicle to stimulate economic growth in poor rural communities. It is significant for job creation, food security and the overall economic growth worldwide (Gueye, 1998; Van der Sluis, 1999). The profitability of broiler production enterprises is vital for enterprise sustainability and viability; hence the understanding of their characteristics and socio-economic factors that influence productivity and profitability are essential. They are important in determining the

appropriate and holistic intervention strategies for improving small-scale broiler production in the Vhembe district.

1.4 Aim of the study

The aim of the study is to analyse the socio-economic factors affecting the gross margin of small-scale broiler producers and thereby determine broiler producers' profitability and contribution towards local economic development in the Vhembe district.

1.5 Specific objectives of the study are:

i. To describe the socio-economic characteristics of small-scale broiler producers

ii. To determine the gross margin for small-scale broiler producers

iii. To determine the extent of socio-economic influence on the gross margin of the small-scale broiler producers

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter review various literature concerning profitability and socio-economic analysis of small-scale broiler production enterprises. This chapter covers theoretical and empirical literature in order to understand and build upon what is already known. Reviewed literature is essential towards the profitability and sustainability of small-scale broiler production which entails the overview of broiler production, constraints, economic profitability and socio-economic factors affecting broiler production.

In most developing countries, poultry production system can be generally differentiated into two groups, namely, commercial and traditional systems (Mlozi *at al.,* 2001). A broiler is defined as chickens (birds) of the species (*Gallus domesticus)* specifically bred for the production of meat under various intensive production systems (European Food Safety Authority, 2010).

Unlike free range birds which are raised under subsistence systems, broilers are fully confined in floor houses or cages. Capital outlay in the broiler enterprise is high and the birds are totally dependent on their owners for all their requirements (FAO, 2010). Many researchers differentiate broiler production systems based on the producer's production capacity, differing from one region to the other. Commercial broiler production is categorized under small-scale, medium-scale and large-scale production systems with modern technology (Moreki, 2011; Adeyemo and Onikoyi, 2012). Adeyemo and Onikoyi (2012) and Moreki (2011) classified broiler production scales by flock sizes as follows: small-scale (≤20,000); medium-scale (20,001-50,000) and large-scale (>50,000) birds per

production cycle. Large scale broiler enterprises regulated based on certain standards with huge bio-security. Market shares indicate that the large-scale broiler producers contribute about 80 % of the total broiler production while the remaining 20 % is attributed to medium- and small-scale broiler production enterprises (DAFF, 2011). Thorton (2007) indicated that large-scale broiler enterprises are vested with efficiency. Moreover, they own means of production like hatcheries (breeds operations), processing plants and feed manufacturing industries which give them an opportunity to mix individualized bird diets in corporate-owned feed mills.

Small-scale broiler production enterprises generally raise medium size flocks of local breeds or cross-bred stock. Furthermore, producers provide housing structures made of local materials, purchase feeds, use vaccines and veterinary services when available and may have minimal bio-security system in place (Ahuja, 2007). Despite the vast contributions of the broiler industry in the national economy (Vusi and Oladele, 2013; DAFF, 2011; 2012), small-scale broiler production enterprise subsectors are facing challenges such as lack of slaughtering facilities, poor quality feeds, supply of poor quality chicks, high feed cost and poor marketing information systems (Moreki, 2011; Siliga, 2002; Taru *et al.*, 2010). Nimoh *et al.,* (2011) and Okantah *et al.,* (2003) reported lack of access to credit as another challenge in small-scale broiler production and an important determinant of production performance because without credit, farmers will not be able to incorporate modern technologies and purchase feeds.

Socio-economic factors of the broiler producers could be relevant in influencing broiler production. These include gender, age, marital status, number of household members, education, sources of income, experience, and number of birds, training, marketing,

extension contact and record keeping. Abed *et al.,* (2011), Adebayo and Adeola (2005); and Ojo (2003) reported positive correlation on experience in most of their respondents that the more years they are experienced in broiler production, the more they would increase the number of their flock sizes depending on the prevailing circumstances.

Abed *et al.,* (2011) attributed this to the fact that producers would use their best resources of feed, labour, capital and management to increase their scale of operation, thereby increasing household income and improving their welfare. Ezeh *et al.,* (2012) reported extension contact, household size, age and educational level as the socio-economic determinants of technical efficiency. Age was also reported to have positive relationship efficiency and this was attributed to the fact that attraction of the youth towards broiler production could be because of inherent viability and profit potential of the enterprise.

Furthermore, the level of education attained by a broiler producer not only increases enterprise efficiency and productivity, but also enhances the ability to understand and evaluate new production technologies (Chukwu, 2007; Obasi, 1991). The effect of socio-economic factors that could influence the gross margin of small-scale broiler producers was also estimated in this study.

2.2 Broiler production in South Africa

Broiler meat is produced throughout South Africa with North West, Western Cape, Mpumalanga and KwaZulu–Natal Provinces being the largest producers accounting for approximately (81 %) of total production (DAFF, 2011). During 2010/11 the North West Province produced (25 %) of the entire broiler meat in South Africa followed by Western Cape Province by (22 %), Mpumalanga Province 18 % and KwaZulu–Natal Province (16

%). The Limpopo and Northern Cape Provinces were the least producers, producing (1 %) each of South African broiler meat production (DAFF, 2012). According to the Limpopo Provincial Growth Development Strategies (2009) and the New Economic Growth Path Framework (2010), Limpopo province agricultural sector contribute only (3 %) of the Gross Domestic Product (GDP) compared to all other provinces. Broiler meat has the highest per capita consumption than all other animal protein (DAFF, 2011).

South Africa consumes more broiler meat than what it locally produces resulting in South Africa being a net importer of broiler meat mainly to satisfy the local demand (DAFF, 2012). Moreover, the per capita of broiler meat consumed in South Africa has increased from 22.0 kg per person in 2002 to 35.8 kg per person in 2011. Wynne and Lyne (2003) indicated that broiler production has been promoted as the most effective form of production that creates jobs; improve food security and economic status of the poor.

In developing countries, small-scale broiler production has been practiced as a poverty alleviation programme and food security at household level as it provides off-farm employment and income generating opportunities (Sonaiya, 2000; Tadelle and Ogle, 2000; Gueye, 2008). Riise *et al.,* (2004) indicated that small-scale broiler producers are able to operate and manage technical enterprises efficiently with a high economic return on the investment. However, Landes *et al.,* (2004) and Taha (2003) highlighted that the significant growth in poultry (especially broiler chicken) production and consumption in developing countries has important implications on the global trading of feeds and related inputs. Many small-scale broiler enterprises have been initiated and supported by government and non-governmental institutions with the sole objectives of job creation, poverty alleviation and growing rural economic base. However, these enterprises are not

sustainable and viable. As a result, their mortality rate is greater than the survival rate benchmarked by the provincial broiler's contribution (DAFF, 2011). Contributing factors to the high mortality rate of Vhembe broiler production enterprises are not known. Hence this study analysed the relationship of socio-economic characteristics of small-scale broiler production enterprises to profitability so that the necessary interventions can be made. Literature on production resources in broiler production systems reviewed in this study includes: day-old chicks, feed cost, housing, litter management, water access, biosecurity, record keeping and marketing channels.

2.2.1 Day-old chicks

The period spent to access day-old chicks determines the interval between the production cycles in broiler production enterprises. According to SAPA (2002), breeders and hatcheries contribute a great deal to the finished product. Daghir (1995) emphasized that the quality of day old chicks is important and therefore chicks should be from a single breeder. Compromised quality of day-old chicks also compromises the end product. Access to day-old chick was reviewed for the purpose of instilling clarity on the production inputs of broiler production enterprises more especially for small-scale broiler production.

2.2.2 Stocking density

Heier *et al*., (2002) described broiler stocking density as the number of weight of broilers that can be reared within a given area. The threshold production capacity for a commercially viable and profitable business is vital in broiler production. Stocking density has critical implications on the broiler industry because higher returns can be obtained as the number of birds per unit space increases, but economic profit may come at the cost of

reduced bird performance, health, and welfare if densities are too high (Sarbaswarup *at al.,* 2012). Benyi *et al.,* (2015) emphasized that broiler production requires a balance between maximization of the weight of bird per unit of the floor area and losses due to overcrowding. Moreover, to achieve both full genetic potential and profitability of the enterprise, birds need to be provided with all the space they need.

The literature recommends different stocking densities for an average commercial broiler production. Brits (2011) recommended 8-4 birds/m^2 for the small-scale farmer and 17-23 birds/m^2 for the large commercial farmer. SAPA (2010) recommended 20-25 birds/m^2 for day old chicks and 10-12 birds/m^2 for 20-25 days old chicks. Uzum (2013) recommended stocking density lower than 18 birds/m^2 whereas Madiya (2003) recommended 21 birds /m^2. Commercial broiler producers are often tempted to increase the number of breeding stock per pen as a method to reduce housing, equipment, and labour cost per pen (Mtileni *et al.,* 2007).

However, Abudabos *et al.,* (2015) argue that in order to achieve a satisfactory economic return, the bird kg must be maximized. This was also supported by the National Chicken Council (2011) who established a voluntary animal welfare guideline which emphasises the maximum limit of stock density based on broiler final body weight, where it ranged from 31.8kg/m^2 for light broilers to 41.6kg/m^2 for roasters. Benyi *et al.,* (2015) further suggested that for profitable broiler production in the tropics and subtropics Ross 308 should be reared at stocking density of 30kgBW/m^2.

As stocking density increases, the metabolic waste and heat production also increases, with temperatures above the litter frequently exceeding 30^0C (Meluzzi and Sirri, 2009). Elevated mortality due to high stocking densities was also reported in poorly ventilated

houses and attributed to ammonia build up which increases susceptibility to respiratory diseases (Tyson, 1995; Heier *et al*., 2002). Škrbić *et al.,* (2008 and 2009b) reported broiler stocking density as a factor of poultry welfare that can influence carcass quality and morbidity in birds can be identified in average stocking density. Furthermore, Nembilwi (2002); Hall (2001) and Britz (2011) revealed that high stocking densities can have a deleterious effect on the economics and welfare of poultry production. A higher mortality, greater incidence of leg problems and disturbed resisting behaviour in birds kept in high stocking densities was also reported. A positive correlation between stocking density and economic return has been reported in broiler production (Buijs *et al.,* 2009; Petek *et al.,* 2010).

2.2.3 Feeds cost

Feed cost has always been a significant in the poultry industry, whilst it is the determinant of efficiency and profitability as it accounts for over 50 % of the total cost of production (Hassan *et al.,* 2011; Haruna and Hamidu, 2004; Kalla, 2007). According to Abed *et al.,* (2011), feed appeared to be the major determinant of flock size, feed conversion and weight gain. Moreover, broilers that are fed *ad libitum* gain weights faster and attain marketable weights easily and are sold at higher unit price. Hassan *et al.,* (2011), Siliga (2002), Emam *et al.,* (2011) and Moreki (2011) confirmed that feed is the main costly item for all broiler production sectors and further suggested that in order to reduce feed costs; efforts should be made to train farmers on how to source locally and utilize poultry feed stuffs to compound feeds.

2.2.4 Biosecurity

Small-scale broiler production is characterised by low biosecurity measures (Conan *et al.,* 2012). Moreki (2011) reported high chick mortality rate which was attributed to poor brooding practices, lack of health management practices including inadequate biosecurity measures and feeding birds with poor quality feeds. Gibbens *et al.,* (2001) reported the limitation of infection by 50 % in a flock with biosecurity.

2.2.5 Record keeping

Record keeping is an important part of the agricultural modernization scheme. Regular and efficient record keeping by farmers is also regarded as a central indicator of modern agriculture in developed countries (Dudafa, 2013). Simmons *et al.,* (1987) emphasized the need for daily broiler performance recorded data to assist producers when other production stakeholders like extension officers and veterinarians monitor farm progress. Dudafa (2013) further indicate that farmers often talk of profit and loss not on the basis of facts and figures derived from performance records, but from intuition or guessing. Broiler management skills with respect to record keeping, savings, reinvestment of accumulated profit and business planning would enhance the economic viability of these enterprises.

2.2.6 Marketing channels

Market access is a major determinant of the economic productivity. The Vhembe district municipality small-scale agriculture is challenged by lack of market access (VLEDS, 2006). Ralivhesa et al. (2013) pointed out that once broilers have reached the desired market weight of about 2100g to 2300g, they should be marketed as soon as possible, if not, the producer will feed them until they are bought at a loss. Small-scale producers sell their

broilers at direct markets where sometimes competition becomes high and the products glut the market, contrary to medium and large scale producers who often sell their birds in formally organised markets like contracts (SAPA, 2012).

2.2.7 Access to finance

The broilers are continually characterized by low production levels attributed to limited access to finance (credit facilities) for the procurement of basic broiler equipment and materials (Okoli, 1991). Lack of access to finance in small-scale broiler production was reported to limit the spate of development of the broiler enterprises and attributed this to low level of production output in the enterprises (Adeyemo and Adeyemo, 2009; and; Akanni, 2007). Ike and Ugwumba (2011) recommended that States and local governments should improve credit delivery to broiler producers as this will go a long way in improving output.

Adeyemo and Onikoyi (2012) further reported the supply of poor quality chicks, high feed cost, poor marketing information system, inadequate slaughtering facilities, inadequate and sometimes outright lack of basic infrastructure such as roads, electricity and water supply as the main constraints in small-scale broiler production enterprises. Siliga (2002) and Agro-Industrial sector (2002) indicated high feed cost as a threat to broiler enterprises. These production factors can negatively affect the farmer's profit and consequently affecting the sub-sector's viability and competiveness (Koney, 1993). Furthermore, access to sustainable financial services enables owners of micro enterprises to finance income, build assets, and reduce their vulnerability to external shocks (Onyeneke and Iruo, 2012).

2.3 Economic profitability of broiler production

Many poultry producers consider broiler farming as unique because its revenue is their main source of income due to its quick returns (Sanni and Ogundipe, 2005). Funds invested in broiler production are recovered faster than in any other livestock production. Many countries have initiated programs aimed at improving small-scale poultry production as a means of promoting socio-economic benefits to rural communities. According to Islam *et al.,* (2002), profitability of a broiler production enterprise mostly depends on good parent stock, quality chicks and feed. Sanni and Ogundipe (2005) indicated that the analysis of cost-return structure in poultry production would facilitate appropriate knowledge of cost implications in order to obtain optimum economic benefit from investment into the industry.

The broiler industry is one of the profitable ventures which can effectively tackle the problem of unemployment as evident in agriculture for improving economic status of the farming community (Singh *et al.*, 2010). SAPA (2012) argued that the unpredictability in profitability is inherent to the broiler industry. This is due to biological factors such as diseases and prolonged turnaround times in the production chain.

2.4 Socio-economic factors affecting small-scale broiler production

Socio-economic factors that influence small-scale broiler production output and profitability include: gender, age, education and experience amongst other key factors that determine productivity of small-scale broiler production (Islam *et al.,* 2010; Ntuli and Oladele, 2013; Ngozi and Chinoso, 2013). Age of a farmer determines whether the farmer is still within the active labour force or not. Age was reported to have serious implications with regard to technological adoption (Islam *et al.,* 2010; Ezeh, 2012; Sankhyan, 2013).

Onyeke and Iruo (2012) confirmed that the age of farmers has a negative impact on the enterprise's output. Experience in broiler farming was also reported as one of the key factors affecting productivity since the longer the years of farming experience, the more experienced the farmer becomes and the more efficient the farmer is expected to be (Ismal *et al.,* 2010; Ike and Ugwumba, 2011). Approximately 80 % of the population in Vhembe district is rural based. This situation greatly impacts on the population's capacity to acquire education, particularly tertiary education which in turn influences the potential for employment in the formal economic sector.

Available information shows that one in three people (33.4 %) aged 20 and above has had no formal education (DoH Annual Plan, 2011/2012-2013/2014). Broiler production requires high level of education in order to understand production risks and adjust the factors used to ensure high productivity. Illiteracy is regarded as a major limitation to technology adoption in livestock production moreover high levels of education will enable producers to access relevant information that stimulate production (Adewunmi, 2008; Aboki *et al.,* 2013). Emmam and Hassan (2011) reported that education has an important influence in managerial ability, adoption of new technologies and decision making.

CHAPTER 3: METHODOLOGY

3.1 Study site

The study was conducted in the Vhembe district. The Vhembe district is located at the North-western tip of South Africa. The Vhembe district municipality covers an area of 21 407 km^2 and is home to approximately 1 294 722 people (Vhembe District Municipality, 2013/2014). The District is composed of four local municipalities namely, Thulamela, Makhado, Mutale and Musina (Figure 3.1).

Figure 3.1: Map of Vhembe district showing the geographical location of four selected municipalities.

3.2 Sampling

Small-scale broiler farmers from four municipalities of the Vhembe district namely: Makhado, Mutale and Musina (sample size of 21 % for each municipality); and 37 % for Thulamela municipality formed the sample frame (Figure 3.2). A total of ninety four (94) small-scale broiler producers were selected using the simple random sampling procedure, where all observations of the frame were given an equal probability of selection.

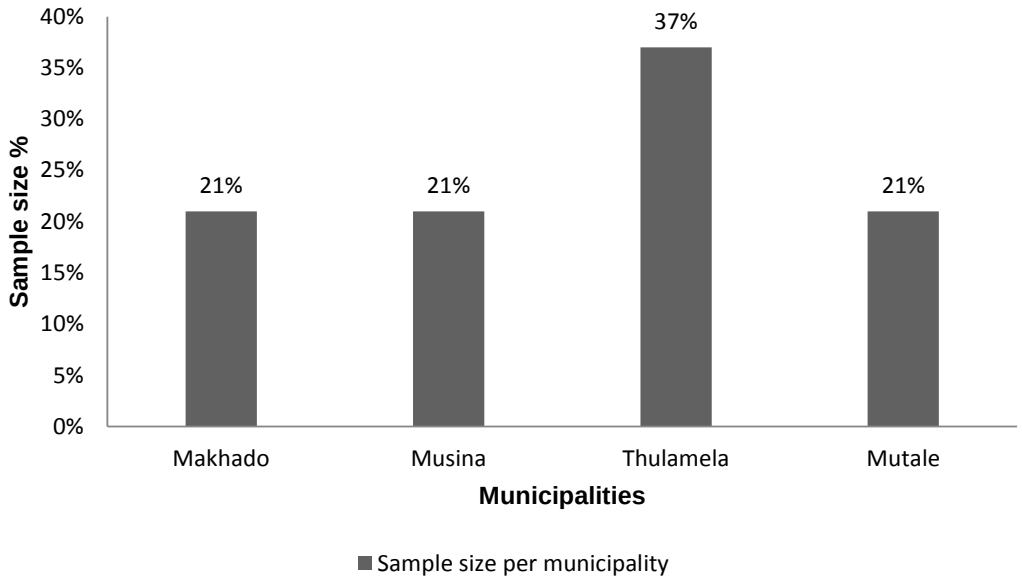

Figure 3.2: Sample sizes from four different municipalities of Vhembe district.

3.3 Data collection

Quantitative data was collected from primary sources through the use of a pre-tested semi-structured questionnaire (Appendix 1) administered to 94 small-scale farmers. The aspects covered in the questionnaire included the small-scale broiler farmers' demographic and specific characteristics on broiler production systems, cash flow in the form of inputs and sale transactions and also the socio-economic factors which were

estimated to demarcate their influence on the gross margin. Secondary data that includes enterprise financial records were obtained from farmers records.

3.4 Data analysis

The data was analysed using the Statistical Package for Social Science (SPSS, 2013). Descriptive statistics was computed using FREQ COUNTS procedures to describe the characteristics of small-scale broiler producers. Gross margin analysis was used to calculate the gross margin of the small-scale broiler producers and Multiple Linear Regression Model (MLR) was used to estimate the extent of socio-economic influence on the gross margin of the small-scale broiler producers in the Vhembe district. The Multiple Regression was represented in general as follows:

$$Y=\alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + \alpha_4 X_4 + \alpha_5 X_5 + \alpha_6 X_6 + \alpha_7 X_7 + \alpha_8 X_8 + \alpha_9 X_9 + \alpha_{10} X_{10} + \alpha_{11} X_{11} + \alpha_{12} X_{12} + U$$

Where: Y is the Gross margin

α_0	represent a Constant
$\alpha_1 - \alpha_{12}$	represent the estimated parameters
$X_1 - X_{12}$	represent the variables indicated
U	is the error term

Gross Margin (GM) profit of an enterprise is revenue less cost of goods sold, divided by revenues (Robins, 2000) = f (gender of household head, age of household head, marital status of household head, number of household members, education in number of years

spent in school by household head, number of years' experience in farming of household head, number of birds per production cycle, number of years spent in broiler production training by household head, market access). The specific regression equation was as follows:

$$GM_i = \alpha_0 + \alpha_1 GEN + \alpha_2 EXP + \alpha_3 MAR + \alpha_4 AGE + \alpha_5 EDU + \alpha_6 INC + \alpha_7 HHM + \alpha_8 FLK + \alpha_9 TRN + \alpha_{10} MKT + \alpha_{11} EXT + \alpha_{12} RCDS + \mathcal{E}$$

Table 3.1: Description of socio-economic variables of Vhembe district small-scale broiler producers

INDEPENDENT VARIABLES		
Variables	**Description**	**Measurement**
X_1	Age of the farmer	Years
X_2	1 if the farmer is male, 0 otherwise	Dummy
X_3	1 if the farmer is married, 0 otherwise	Dummy
X_4	Farming experience of the farmer	Years
X_5	1 if the farmer has formal education, 0 otherwise	Dummy
X_6	Household income of the farmer	Dummy
X_7	Size of the household of the farmer	Per head
X_8	The flock size of the farmer	Per head
X_9	1 if the farmer received training, 0 if otherwise	Dummy
X_{10}	1 if the farmer has access to market, 0 otherwise	Dummy
X_{11}	1 if the farmer has access to extension services, 0 otherwise	Dummy
X_{12}	1 if the farmer keep farming records, 0 otherwise	Dummy

Gross Margin (GM) analysis was used to determine the profitability of the small-scale broiler enterprises. GM for all small-scale broiler producers was compiled by collecting information on variable input costs such as: Acquisition of day-old chicks, feed, litter, electricity, medication, repairs, rent and transportation. Fixed costs for buildings structures were not considered for gross margin analysis. Table 3.2 illustrates the expected signs of coefficient for Vhembe district independent socio-economic variables. The following information on income (price of birds sold and number of birds sold) was used to calculate the gross margin. The formula for Gross Margin was given (per 100 birds) as follows:

Gross margin = Gross revenue – Total variable cost

Thus

$GM_i = \sum P_i Y_i - C_i$

Where: GM_i = Gross margin of each broiler enterprise $_i$

P_i = Price per live birds

Y_i = Number of live bird sold

C_i = Total variable cost incurred

$_{i.....n}$ = Total number of birds

The most profitable small-scale broiler enterprise will be the one with the largest GM.

Table 3.2: Expected signs of independent socio-economic variables for Vhembe district

Independent socio-economic variable	Expected signs
Gender of the household head	+
Age of household head	+/-
Marital status of household head	+/-
No. of household members	+/-
Education in number. of years spent in school by household head	+
Source of household income	+/-
No. of years of experience in broiler production	+
No. of birds reared per production cycle	+
No. of years spent in broiler production training by household head	+
Access to markets by household head	+
Extension contacts by household head	+/-
Record keeping	+/-

CHAPTER 4: RESULTS

4.1 Descriptive results

Table 4.1 shows the descriptive statistics of the four components of the gross margin. The minimum and maximum flock sizes of the small-scale producers in the Vhembe district were 100 and 3200, respectively. On the average, the flock size was found to be 769 broilers per production cycle. The minimum and maximum prices charged by small-scale broiler producers in Vhembe district were between R50 and R55 respectively.

The expenditures incurred by the small-scale broiler producers in Vhembe district ranged from R1 500 to R114 000 and the average expenditure incurred in the production process was R27 138.44. The revenue accumulated by the small-scale broiler producers in Vhembe district ranged between R6 000 and R165 000 while the average total revenue was R44 434.39. The gross margin accumulated by the small-scale broiler producers in the Vhembe district was between R4 500 and R55 600, while the average total revenue was R19 027.20.

Table 4.1 Descriptive analysis of the gross margin components

VARIABLES	MEAN	SD	MIN	MAX
Flock size	768.78	27.73	100	3200
Broiler price	60.00	7.66	50	55
Producer ‘expenditure	27 138.44	164.74	1 500	114 000
Producer ‘expenditure	44 439.89	210.81	6 000	165 000
Gross margin	19 027.20	137.94	4 500	55 600

The socio-economic analysis frequencies of the small-scale broiler producers in the Vhembe district are presented in Table 4.2. Small-scale broiler producers in the Vhembe district are dominated by female farmers (64 %). Most of the broiler producers in Vhembe district are less than forty years of age (60 %) while 40 % of the producers were fourty years old and above. About 75 % of the small-scale broiler producers depend on farming as their main source of income while the remaining 25 % depend to hawking, social grants and salaries from non-agricultural employment.

The level of education of small-scale broiler producers in the Vhembe district is dominated by respondents who have acquired secondary education (63 %), whereas the remaining 37 % had primary education, informal education and tertiary education. About 37 % of small-scale broiler producers in the Vhembe district have more than five years' experience in broiler farming while the remaining 63 % have less than five years' experience in broiler farming.

Table 4.2: Frequencies of Vhembe district small-scale producers

Variables	Option	Frequency (N)	Percentage (%)
Gender	Male	34	36
	Female	60	64
Age	Less than 40 years	56	60
	40 and above	38	40
Marital status	Single	11	12
	Married	20	21
	Divorced	34	36
	Widow	29	31
Experience	Less than one year	26	28
	From one to two years	19	20
	Between two and five years	14	15
	More than five years	35	37
Educational level	No formal education	20	21
	Primary education	10	11
	Secondary education	59	63
	Tertiary education	5	5
Household size	Five and less	55	58
	Six and more	39	42
Source of income	Broiler farming	70	75
	Hawkers	9	9
	Salary	15	16

Figure 4.1 illustrates the flock size of small-scale broiler producers' in the different municipalities of the Vhembe district. The highest propotion of producers own flock sizes ranging between 1 and 1000 broilers in Mutale were (90 %), while Makhado were (82 %) and Musina were (82 %). Thulamela municipality dominates all other municipalities in terms of having higher number of flock sizes. Producers with 1001 to 3000 were dominating and over 3001 flock sizes as compared to other municipalities (Figure 4.1).

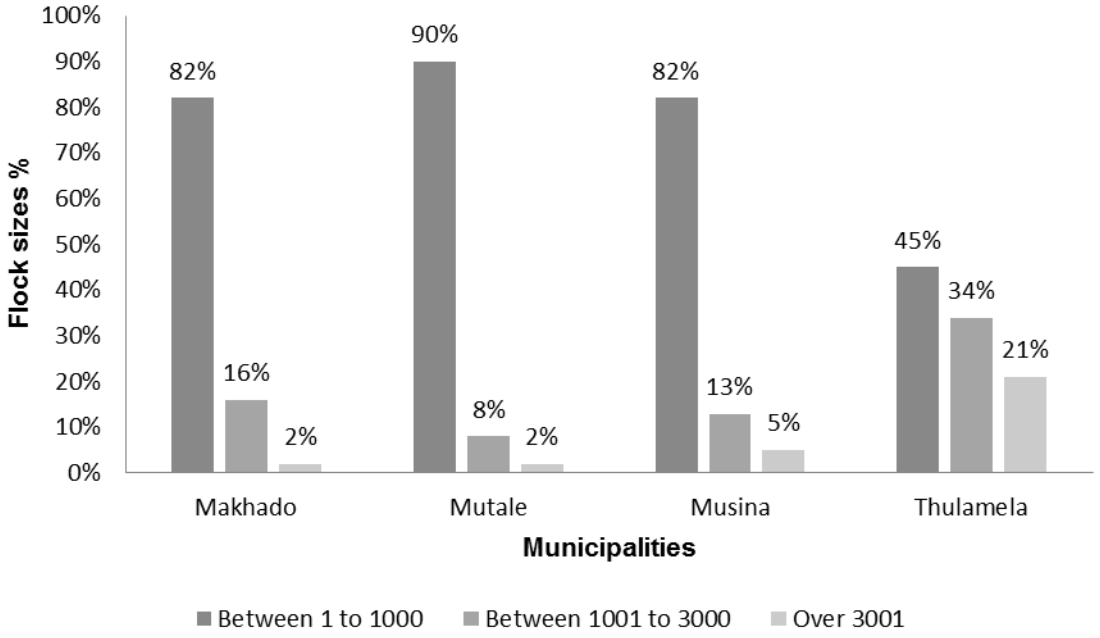

Figure 4.1: Small-scale broiler producer's flock sizes in different municipalities of Vhembe district.

Small-scale broiler producer's market acess in different municipalities of Vhembe district are shown in Figure 4.2. The descriptive result shows that over 70 % of broiler producers in all municipalities have access to market whereas less than 30 % do not have access to the market.

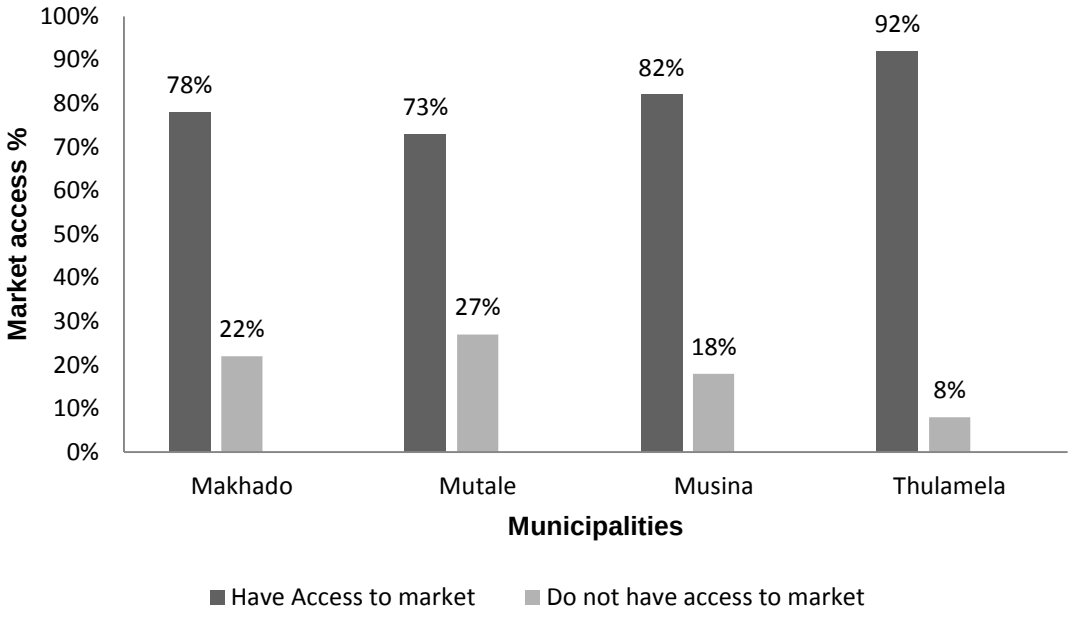

Figure 4.2: Small-scale broiler producer's market access in different municipalities of Vhembe district.

Small-scale broiler producer's record keeping in different municipalities of the Vhembe district are presented in Figure 4.3. The result shows that over 70 % of broiler producers in all municipalities keep broiler performance records whereas less than 30 % do not keep record.

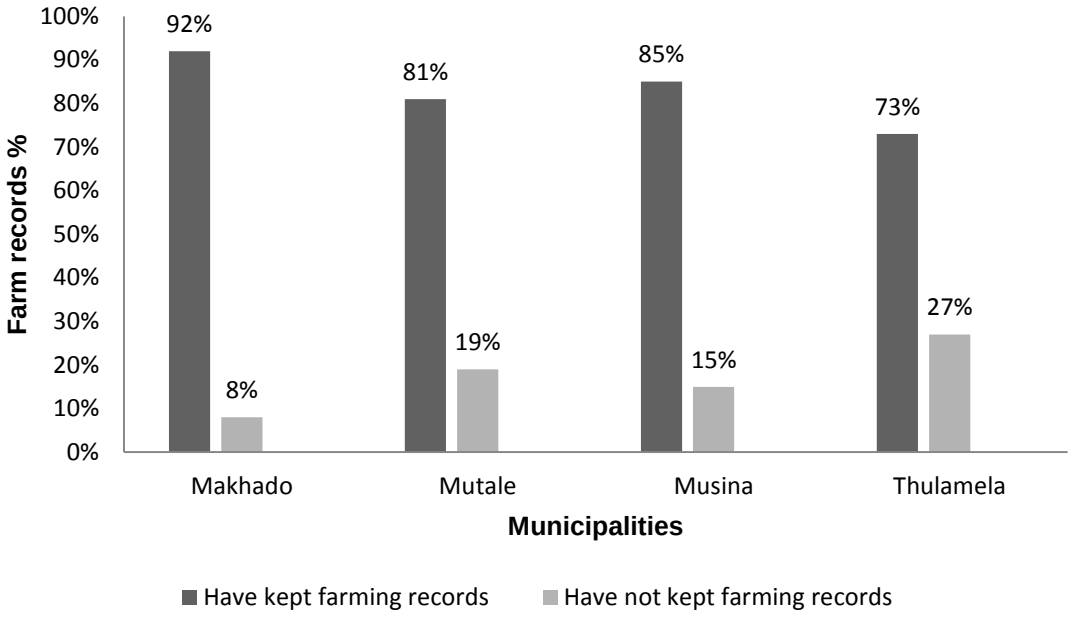

Figure 4.3: Small-scale broiler producer's record keeping in different municipalities of Vhembe district.

Figure 4.4 indicate the distribution of the small-scale broiler producer's extension services in different municipalities of Vhembe district. Over 80 % of broiler producers in all municipalities receive extension services.

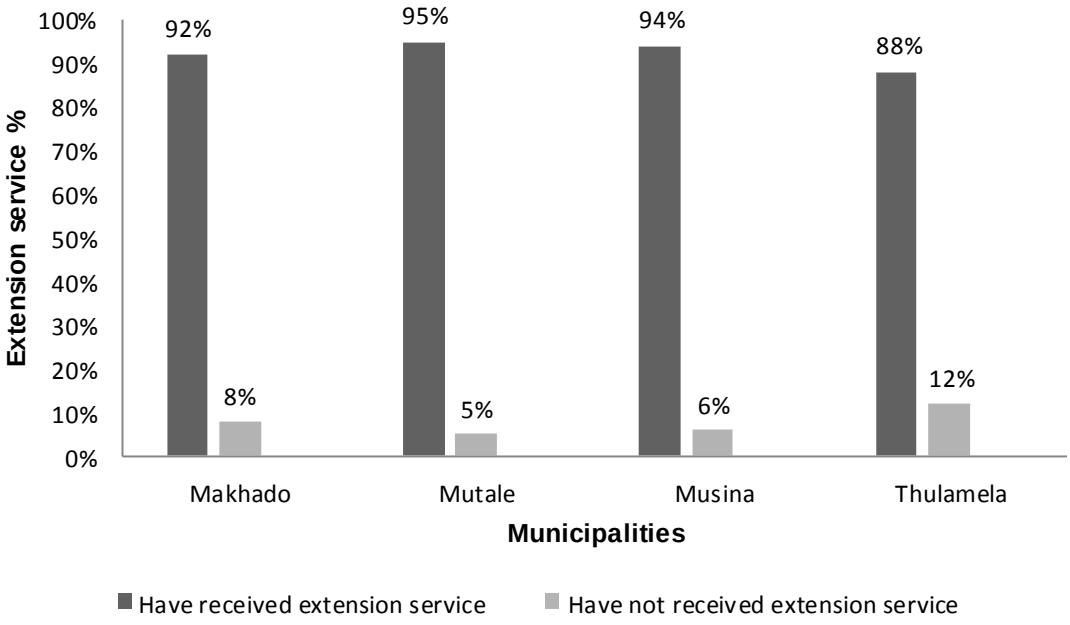

Figure 4.4: Small-scale broiler producer's extension services in different municipalities of Vhembe district

4.2 Gross Margin Analysis

The gross margins of 94 small-scale broiler producers were estimated and used as the dependent variable in the multiple linear regressions. Table 4.3 represents the summary of the gross margin of the 94 small-scale broiler producers in the Vhembe district. The gross margin in rands determined on the basis of minimum values was found to be R2 700 while its gross margin percentage was shown to be 40 %. The gross margin in Rands determined on the basis of average values was found to be R22 248 while its gross margin percentage was shown to be 49 %. The gross margin in Rands determined on the basis of maximum values was found to be R96 000 while its gross margin percentage was shown to be 55 %.

Table 4.3: Small-scale broiler producers' gross margin analysis of Vhembe district

Number of birds sold per production cycle	Price of birds (ZAR)	Total revenue (ZAR)	Total expenditure (ZAR)	Gross margin (ZAR)	Gross margin (%)
100	55	5 500	2 800	2 700	40
796	55	43 780	21 532	22 248	49
32 000	55	176 000	80 000	96 000	55

4.3 Multiple Linear Regression Results

The model results highlight the extent to which various socio-economic factors affect the gross margin of the small-scale broiler producers in the Vhembe district. Table 4.4 presents the estimated parameters (coefficient of socio-economic factors affecting the gross margin of small-scale broiler producers), standard error of estimates, t-statistics of estimates, confident interval through P-values and the adjusted R squared. The adjusted R squared of 0.88 implies that the variables included in the model were able to explain 88 % of the variation.

This reveal that the model used fit well to the variables identified. Standard error of 12 % shows the amount of errors occurred. T-Statistic was used to highlight the departure of an estimated parameter from its notional value and standard error and is used in hypothesis testing; variables that have a t - ratio of greater than 2 are significant. Age, farming experience, educational level, household income, flock size, training received, market access, access to extension services and record keeping were significant for gross margin, while gender, marital status and household size were insignificant.

Table 4.4 Estimated parameters (coefficient of socioeconomic factors affecting the gross margin of small-scale broiler producers in Vhembe district)

Variable	Beta	Standard error	t-statistics	P-value
Age	-0.238***	0.110	2.164	0.001
Gender	0.326	0.548	0.595	0.365
Marital status	-0.016	0.765	0.021	0.351
Farming experience	1.586***	0.181	8.762	0.002
Educational level	0.964**	0.333	2.295	0.045
Household income	0.367	0.123	2.984	0.050
Household size	-0.945	1.623	1.189	0.511
Flock size	1.945***	0.255	7.620	0.002
Training received	1.189***	0.179	6.642	0.005
Market access	1.880***	0.411	4.576	0.002
Access to extension	1.248*	0.441	2.830	0.057
Record keeping	0.802***	0.201	3.990	0.001
Adjusted R squared = 0.88				

*, **, *** represent the significant level at 10 %, 05 % and 01 %, respectively

CHAPTER 5: DISCUSSION

Demographic characteristics of a population are important for classification purposes. It constitutes an essential aspect of the study since it provides basic information about the respondents (Proctor, 2000). The human resources component of a farming enterprise forms an indispensable ingredient in agricultural production. Bowie and Buttle (2013) observed that the human element as a key factor in agricultural and rural development because of its importance in decision making which is fundamental to good management and successful farming. Biological characteristics as well as social, economic and psychological traits of a farming community influence the productivity of farming and dictate the communication strategy and the technology that must be developed for a given area.

Female farmers were found to dominate small-scale broiler production (Vhembe District Local Economic Development Strategy, 2009). Similar findings were reported by Ngozi and Chinonso (2013) that female gender dominates broiler production enterprises. This could be attributed to the less intensive labour demand of poultry farming which female gender could provide and females are found to be more caring as required during broiler rearing than their male counterparts.

The majority of small-scale broiler producers in the Vhembe district were less than 40 years old. This could be attributed to the fact that majority of young people under the age of 40 are unemployed (Quantec, 2006) and as such, they initiate broiler production as a means of survival. Vhembe District Local Economic Development Strategy (2009) indicated that the combined unemployed and underemployed populations in the Vhembe district amounted to 45% of the labour force. Thus, broiler farming could be the turnaround

strategy to generate income in order to uplift individuals' livelihoods. Similarly, Dlova *et al.,* (2004) observed that age is one of the factors that can affect the probability of a farmer being successful in farming; they further stated that younger farmers are more adaptive and more willing than older people to try new methods.

The descriptive results indicate that the majority of the respondents involved in small-scale broiler production in Vhembe district were divorced followed by widowers. The reason for this proportion could be that the two groups (divorcees and widowers) are household heads who have to provide both social and economic support to their family members. This finding agrees with Sanni and Ogundipe (2005) who reported that many people consider broiler farming as unique since its revenue is their main source of income due to its quick returns. Thus, funds invested in broiler production are recovered faster than in any other livestock enterprise since its life cycle is very shorter. Hence the majority of divorcees/widowers go into broiler production since they need quick and short term returns to support their single headed households. On the contrary, Lyanga (2011) reported that single parents prefer to be involved in travelling entrepreneurship economical activities than engage in farming business.

The majority of small-scale broiler producers were found to have more than five years of broiler production experience. The reason could be that chicken farming has been associated with rural communities for a long time, and the Vhembe district is 95 % rural. Similar results were reported by Ike and Ugwumba (2011) that experience acquired during training may prove to be more relevant in affecting output than acquired education. In broiler farming, experience contributes positively in the overall production.

A high proportion of the respondents have secondary level education. This could imply a better chance of doing well in the broiler production business since is able to read and write. Maliwichi and Obadire (2010); Vusi and Odele (2013) emphasized that education is an important factor in running a small-scale business as it influences managerial ability. This implies that broiler producers who could read and write could as well correctly follow the technical recommendations. On the contrary, Ike and Ugwumba (2011) emphasized that mere formal education cannot substitute the influence of acquired experience in affecting output for a particular enterprise.

The majority of the respondents received their income from broiler farming. This could be attributed to the fact that the Vhembe district is a former homeland plagued by high rate of unemployment and poverty and as such, self-employment becomes an alternative. According to Bowie and Buttle (2013), the amount and source of disposable income people have to spend varies with the environmental conditions. Moreover, Mozumdar *et al.,* (2009) reported that through participation in broiler farming household income increased.

The descriptive results show that the majority of the small-scale broiler producers in the four municipalities of the Vhembe district have access to market. This could be attributed to popular demand of white meat, especially broiler meat as most of the community members becomes health conscious. During the year 2010, an estimated 18 % of local poultry meat consumed was imported. The poultry meat consumed in 2010 accounted for approximately 57 % of total consumption of red meat in South Africa. The reason for the high consumer demand for poultry meat is that white meat is considered healthier and cheaper than red meat.

A high proportion of the farmers keep broiler performance records (Okantah *et al.,* 2003). This could be attributed to the fact that a percentage of the broiler producers in the district can read and write. Also, the advice given by extension officers could be a contributing factor to record keeping. Similar findings were reported by Moreki (2011) that market access, extension services and keeping farm record are essential when attempting to maximize the profit margin. Contrary to this, Aboe *et al.,* (2003); Vusi and Oladele (2013) reported that farmers either did not keep records at all or if they did, they did not use them for calculating profits, planning or evaluating their businesses.

The majority of the small-scale broiler producers of Vhembe district operate under small-scale category with flock sizes ranging from one and thousand birds. This could be attributed to the fact that there is limited access to start-up capital and limited access to production inputs such as, access to day-old chicks and feed. Similar results were reported by Ngozi and Chinoso (2013) that small-scale broiler producers are in the majority in the broiler farming enterprise due to high monetory input required to operate a large-scale enterprise and inadequate access to capital faced by farmers.

The gross margin of each respondent was determined in order to assess the actual performance by relating profit to the capital input to generate their profit margins per production cycle. The gross margins revealed that broiler production enterprise is a profitable venture if it achieves a gross margin percentage of 40 % on the average. This result implies that small-scale broiler producers with average flock size were able to achieve estimated gross margins of R18 233 per production cycle. The rationale behind the different gross margin per cycle is the different flock sizes, prices and expenditures.

The gross margin is positively correlated with the flock size, i.e. the higher the flock size, the higher the gross margin (Ralivhesa *et al.,* 2013).

Gross margin could be limited by the unavailability of market for broilers. Broilers need to be sold immediately after reaching the market age; if they are not sold they consume more feed which is at the expense of the producer. Low gross margins could also be attributed to the selling price which is not determined by inflation and high cost of production inputs. Feed cost has been reported by many researchers as the most expensive input in broiler production (SAPA, 2012; Siliga, 2002).

A Multiple Linear Regression analysis indicates the extent to which each variable affects the gross margin. Some of the variables were significant and their levels of significance varied between 10 % (less significant), 5 % (moderately significant) and 1 % (most significant). Age of the broiler producer was found to have a negative relationship with gross margin of broiler production. For every one year increase in the age of the producer, there was a decline of 0.238 in the gross margin realized by small-scale farmer (i.e. 24 % decline in gross margin). Age of the broiler producer was found to be statistically significant at 1 % level. This implies that the older the farmer the lower the gross margin he or she realised. This result could be ascribed to the fact that the older the farmer gets, the more they are likely to be less active and has low innovation capacity. This finding agrees with that of Dlova *et al.,* (2004); Ismal et al., (2010); Mudau *et al*., (2012); Ezeh (2012) and Sankhyan (2013) who confirmed the effect of age on the farm output.

The gender of broiler producers was found to be positively correlated with the gross margin of small-scale broiler production in Vhembe district. Female farmers found to be

more productive with 0.326 gross margin increases. This could be attributed to the fact that care, commitments and dedication between men and women differ.

The marital status of broiler producers was found to be negatively related to the gross margin of small-scale broiler production in the Vhembe district. When the small-scale broiler farmer is married, the gross margin will eventually decline by 0.016 (i.e. 2 % decline in gross margin). However, the variable was found to have statistically insignificant effect on the gross margin realised by farmers. Similar results were reported by Emaikwu *et al.,* (2011) and Dlova *et al.,* (2004) that marital status does not influence farm output or the flock size.

The farming experience of the broiler producers was found to be positively related to the gross margin of small-scale broiler production. This implies that the higher the farming experienced of the farmer, the higher the gross margin realized. A one year increase in farming experience will result to 1.586 increases in gross margin. In addition, farming experience was found to be statistically significant at 1 % level. Ezeh *et al.,* (2012) reported that education has significant relationship with technical efficiency and efficiency increases with an increase in production experience.

The educational level of the broiler producers was found to be positively related to gross margin of small-scale broiler production in Vhembe district. The higher the educational level of the farmer, the higher the gross margin. Educated farmers take into account the opportunity costs of any decision before implementation. The result shows that an increase in the level of education from primary to secondary or secondary to tertiary level increase the gross margin of small-scale broiler production by 0.964 (i.e. 96 % increase in

gross margin). Variable “Educational level” was found to be statistically significant at 5 % level (i.e. 95 % confidence intervals).

Household income of the broiler producers was found to be positively related to the gross margin of broiler production in the Vhembe district. This could be attributed to the fact that household with higher household income are able to meet their household and business needs. When the household income increases by one Rand, the gross margin will increase by 0.367 (i.e. 37 cents in every rand or 37 % increase in the overall gross margin). Household income of the farmer was found to be statistically significant at 5 % level (i.e. 95 % confidence intervals). By implication that would mean that, the higher the household income of the farmer, the higher the gross margin. This finding concurs with the finding of Adebayo and Adeola (2005) that finance and input had significant relationship with average production of the respondents.

The Household size of the broiler producers was found to be negatively related to the gross margin of small-scale broiler production in the Vhembe district. When the size of the farmers ‘household size increases, the gross margin will decline by 1.930 (i.e. more than 100 % decline in gross margin). This could be attributed to the fact that the bigger the household size, the higher the household expenditure. Nevertheless, the variable was found to be statistically insignificant in affecting the gross margin realised by farmers. This result contradicts those of Dlova *et al.,* (2004); Ezeh *et al.,* (2012) and Mkhabele (2014). The authors found household size to have a positive effect in gross margin. They further suggested that larger household may utilize family labour which helps in reducing labour costs and creates strong basis for improved technical efficiency.

The flock size was found to be positively correlated to the gross margin. An increase in the flock size by one unit will lead to 1.945 increases in the gross margin (i.e. almost 200 % increase in the gross margin). This implies that the larger the flock size, the higher the gross margin. The variable 'flocks size' was found to be statistically significant at 1 % level (i.e. 99 % confidence intervals). These results could be attributed to the fact that the higher the flock size, the more the inputs the farmer has to provide and the higher the chance for getting discount.

The training of the broiler producers was found to be positively related to the gross margin. The more the farmers receive training on farming, the higher the gross margin. The trained farmers will be more informed on the production requirements which are positively correlated to gross margin. An increase in the level of training leads to an increase in the gross margin of small-scale broiler production by 1.189 (i.e. more than 100 % of the gross margin). The variable "training" was found to be statistically significant at 1 % level (i.e. 99 % confidence intervals).

The market access was found to be positively correlated to the gross margin. Increase in market access leads to an increase in gross margin by 1.880 (i.e. more than 100 % increase in gross margin). The variable 'market access' was found to be statistically significant at 1 % level (i.e. 99 % confidence intervals). The analysis of cost-return structure in poultry production would facilitate appropriate knowledge of cost implications in order to obtain optimum economic benefit from the investment in the industry (Sanni and Ogundipe, 2005).

Access to extension services by broiler producers was found to be positively related to the gross margin. The result shows that an increase in the access to extension services lead to an increase in the gross margin of small-scale broiler production by 1.248 (i.e. more than 100 % of the gross margin). The variable “access to extension services” was found to be statistically significant at 10 % level (i.e. 90 % confidence intervals). The more farmers have access to extension services, the higher the gross margin. Farmers having access to extension services are more informed on the farming practices which is positively correlated to gross margin.

Record keeping was found to be positively correlated to the gross margin of small-scale broiler production in Vhembe district. The record keeping was found to have influence on the gross margin wherein, an increase in the ability to keep enterprise record by one unit lead to 0.802 increases in the gross margin (i.e. about 82 % increase in the gross margin). This implies that the more the farmer keeps record, the better the gross margin. The variable ‘record keeping’ was found to be statistically significant at 1 % level (i.e. 99 % confidence intervals).

CHAPTER 6: SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 SUMMARY

The descriptive findings indicated that majority of the respondents were females aged less than 40 years. About (31 %) of the farmers have more than five years of experience in broiler production. The findings further realed that the majority (63 %) of the respondents have secondary level of education. About 58 % of the respondents have a family size of atmost five members and 75 % of them depend on broiler farming as their major source of income.

The findings concerning the gross margin for small-scale broiler producers indicated that the minimum and maximum flock size was between 100 and 3000 production capacity per production cycle. The gross margin in rand determined on the basis of minimum values was found to be R2 700 while its gross margin percentage was shown to be 40 %. The gross margin in rand determined on the basis of average values was found to be R22 248 while its gross margin percentage was shown to be 49 %. The gross margin in rand determined on the basis of its maximum values was found to be R96 000 while its gross margin percentage was shown to be 55%.

The Multiple Linear Regression Model results highlighted the extent to which various socioe-conomic factors affect the gross margin of the small-scale broiler producers in the Vhembe district. The model used indicated that it fitted well with the variables identified. Standard error of 12 % shows the amount of errors occurred. T-statistic was used to highlight the departure of an estimated parameter from its national value and standard error; variables that have a t-ratio of greater than 2 are significant.

The following nine variables revealed correlation and significance (Age, farming experience, flock size, training received, market access, and record keeping= 01%), (educational level, household income= 05%), (access to extension = 10%) to gross margin, whilest gender, marital status and household size indicate no correlation to gross margin.

6.2 CONCLUSION

The manner in which the small-scale broiler producers are characterised in the Vhembe district shows that women are in the majority. This finding promotes women empowerment which is in line with the government priorities. However, the sector is dominated by less experienced farmers, only 31 % of the broiler farmers have five years' experience in broiler production enterprises, and as such, the farmers need to be capacitated with broiler technical production skills. There is a need to invest more in the sector since 75 % of the respondents depend entirely on the sector as their major source of income.

While determining the gross marging for small-scale broiler producers in the Vhembe district, it was revealed that broiler producers are able to yield profit from broiler production enterprises. However, the Multiple Linear Regression model estimates results indicated the extent to which selected variables affect the gross margin of small-scale broiler producers. The conclusion drawn from the findings is that the majority (72 %) of small-scale broiler producers have a flock size of 100 broilers per production cycle. The results indicated that the flock size correlate and is significant to the gross margin. On the basis of these findings, the identified socio-economic factors are of significant important in influencing the gross margin of small-scale broiler producers. However there is a need to

consider the gross margin in order to ensure the sustainability of small-scale broiler production.

6.3 RECOMMENDATIONS

The study recommends intensive regular broiler production management training programme (at least once every quarter) aimed at training farmers so as to improve or enhance the gross margin of small-scale broiler farmers in the district. The study further recommend a programme aiming at developing a youth recruiting strategy so as to ensure their active participation in agriculture, particularly in broiler production. In order to maximize profit, this study recommends the introduction of a broiler production value chain approach. The production capacity of small-scale broiler producers in Vhembe district was found to be very low. In order to improve broiler production capacity in the Vhembe district, easy access to funding through the establishment of microfinances or rural cooperative banks wherein farmers could be shareholders and clients concurrently is recommended. These might promote the establishment of profitable and viable broiler production enterprises which may contribute positively towards the national and local economic development. There is a need to develop a model which will assist producers to be financially sustainable, without building a dependency syndrome as well as not compromising the micro lending principles. To effectively address production constraints affecting gross margin of small-scale broiler producers, it is, therefore, fundamental to consider their socioeconomic profiles of broiler producers.

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APPENDIX 1: QUESTIONNAIRE FOR SMALL-SCALE BROILER PRODUCERS

Topic: Profitability and socioeconomic analysis of small-scale broiler production enterprises in Vhembe District, Limpopo Province

Questionnaire number	
Date of interview	
Name of broiler production enterprise	
Name of local municipality	
Village	
Name of respondent	
Position of respondent in the enterprise	
Contact numbers of respondent	
Signature of respondent	

A. CHARACTERISTICS: MARK WITH AN X

1. DEMOGRAPHIC CHARACTERISTIC OF THE RESPONDENT.		NUMBER OF RESPONDENTS		
		MALE	FEMALE	TOTAL
1.1What is the gender of respondent?				
1.2Age of respondent	Less than 40 years			
	40 years and above			
1.3 Marital status of respondent	Single			
	Married			
	Divorced			
	Widow			

DEMOGRAPHIC CHARACTERISTIC OF THE RESPONDENT.		**NUMBER OF RESPONDENTS (MARK WITH AN X)**		
		MALE	FEMALE	TOTAL
1.4 What is the experience of the farmer in broiler rearing?	Less than one year			
	From one to two years			
	Between two and five years			
	More than five years			

1.5What is the respondent's level of education?	No formal education			
	Primary education			
	Secondary Education			
	Tertiary education			
1.6What is the household size of a broiler producer?	Five and less			
	Six and above			
1.7What is the source of income for the farmer?	Broiler farming			
	Hawker			
	Salary			

1.8 What is the flock size of your broiler production enterprise?	Between 1 and 100	
	Between 1000 and 3000	
	Over 3000	

	Mark either YES or NO	
1.9 Do you have access to market for your broilers?		
1.10 Do you keep farm records in your broiler production enterprise?		
1.11 Do you receive extension service in your broiler production farm or enterprise?		
1.12 Did you receive any training on broiler production and management?		

B. BROILER PRODUCTION ENTERPRISE CASH FLOW ANALYSIS

1. What is the total number of broilers reared per production cycle?			
2. Complete the table below based on enterprise cash flow.			
Description	**Quantity purchased**	**Unit price**	**Totals**
Day old chicks			
Feeds			
Saw dust			
Electricity			
Medication			
Labour			
Repairs			
Rent			
Transportation fee			
Overall total expenditure			
3. Based on the above cash flow analysis, what is the total expenditure per production cycle?			
4. What is the total number of broilers sold per production cycle?			
5. At what cost do you sell each broiler in a single production cycle?			
6. Based on the above cash flow analysis, what is the total amount generated after broiler sales per production cycle?			