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FACTORS INFLUENCING THE COMMERCIALISATION OF EMERGING DAIRY FARMERS IN SOUTH AFRICA: A CASE STUDY OF THE FREE STATE PROVINCE

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A thesis submitted in fulfilment of the requirements for the degree

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DECLARATION

I, Karabo Peter Molomo, declare that the dissertation at this moment submitted by me for the Philosophiae Doctor in Sustainable Agriculture (PhD) degree at the University of the Free State is my own independent work and has not previously been submitted by me at another university/faculty.

_____ _____

Karabo Peter Molomo Date

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“Being confident of this very thing, that He who begun a good work in you will complete it until the day of Jesus Christ”.

DEDICATION

This dissertation is dedicated to my father, Pastor ST Molomo, and my late mother, EM Molomo, who provided me with a solid educational foundation and supported me throughout my studies. Special dedication to my late Aunt Madichaba Mokonyane, my daughter Molebatsi Molomo and my family.

ABSTRACT

This case study research aimed to identify factors that influence the commercialisation of emerging dairy farmers in the Free State Province, and assess the utility of dairy business hub models to address the identified factors. The study thus sought to answer the following research questions: What are the challenges influencing the commercialisation of emerging dairy farmers in the Free State Province? What are the opportunities for the commercialisation of emerging dairy farmers in the Free State Province? What strategies can be used to assist emerging dairy farmers to become commercial farmers? How can dairy business hub models help to commercialise emerging dairy farmers in the Free State Province?

Semi-structured interviews were used to collect case study data from 15 emerging dairy farmers in the Free State Province. The focus group in this case study included dairy professionals from the Agricultural Research Council (ARC) and SA Stud Book. Data were captured into excel and analysed by qualitative and quantitative methodologies, using the Statistical Package for the Social Sciences (SPSS) version 27. The quantitative data were analysed using frequency tables and descriptive statistics. Themes were used to code and analyse the qualitative data.

The study identified the main constraints impacting the commercialisation of emerging dairy farmers in the Free State Province as: lack of access to financial support, market limitations, lack of infrastructure, low milk prices and lack of appropriate management skills. The results further showed that there are good prospects for commercialising emerging dairy farmers in the Free State Province. It was found that, provided they are correctly implemented, dairy business hub models can pave the way for the commercialisation of emerging dairy farmers in the Free State Province. The study recommends that the government provides emerging dairy farmers with various forms of support, including structural, financial, and market access assistance to help them commercialise their dairy enterprises. Further research should be conducted on implementing dairy business hub models for emerging dairy farmers in South Africa.

Keywords: emerging dairy farmers, commercialisation, dairy business hub model, challenges

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LIST OF ABBREVIATIONS / ACRONYMS

ABS:	American Breeders Society
ARC:	Agricultural Research Council
BMC:	Botswana Meat Commission
CDDP:	Community Dairy Development Program
DAFF:	Department of Agriculture, Forestry and Fisheries
DBHM:	Dairy Business Hub Models
DRDLR:	Department of Rural Development and Land Reform
DALRRD:	Department of Agriculture, Land Reform and Rural Development
EADDP:	East Africa Dairy Development Program
EF:	Emerging farmer
EU:	European Union
FAO:	Food and Agriculture Organisation
GDP:	Gross Domestic Product
ICRAF:	International Centre for Agroforestry Research
IDT:	Independent Development Trust
ILRI:	International Livestock Research Institute
KCC:	Kenya Cooperative Creameries
MPO:	Milk Producers Organisation
MTT:	Mobile Milk Tester
PLAS:	Proactive Land Acquisition Strategy

SH:	Smallholder farmer
SNF:	Solid Non-Fat
SPSS:	Statistical Package for the Social Science
UHT:	Ultra-High Temperature
USA:	United States of America
VMC:	Village Milk Collection Center
WHO:	World Health Organization

CHAPTER 1 :
GENERAL INTRODUCTION

1.1 BACKGROUND OF THE STUDY

The dairy industry is of great socio-economic importance globally. Milk production significantly contributes to household livelihoods, food security, and nutrition. It is a significant source of cash income for farmers and frequently provides relatively quick returns. More than 150 million households worldwide rely on milk production for their livelihoods. In most developing nations, milk is mainly produced by smallholder and emerging dairy farmers (FAO, 2019).

Developing countries' share of the global dairy output has increased significantly in recent years. This increase has been driven primarily by the rise in the number of milk-producing animals, rather than increased productivity per head. Factors such as unavailability of high-quality feed resources, poor health management, limited market access, inadequate facilities and low genetic merit are limiting the productivity of milk animals in developing countries. Furthermore, most developing countries fall under tropical or subtropical regions where the hot and humid climates negatively impact dairy production (FAO, 2019).

The South African livestock sector is divided into a well-established commercial sector and low-income subsistence farmers. Between these two extremes are emerging farmers, who are on the verge of becoming commercial (Meissner, Scholtz and Palmer, 2013). Zantsi, Greyling and Vink (2019) define emerging farmers as those farmers who benefited from the government's rural reform programs and rely mainly on state and semi-government organisations for funding. Mazibuko (2013) describes an emerging farmer as someone who aspires to farm successfully despite physical, mental and socio-economic constraints and requires an external facilitator's assistance to achieve this goal.

According to Meissner et al. (2013), dairy farming significantly contributes to South Africa's agricultural sector, contributing substantially to the country's economic development and sustainability. Emerging dairy farmers in South Africa have the potential to participate meaningfully in the national dairy industry, particularly in rural

areas, because milk can be a reliable intermediate product of extensive livestock farming in the resource-poor sector. Kumbirai (2016) stated that milk produced at such a scale could provide much-needed protein in the human diet and a small but sustainable monthly income in many households.

The main challenges affecting the successful commercialisation of emerging dairy farmers are not well documented; however, they are believed to include lack of knowledge and skills, inadequate access to credit, poor access to markets, lack of access to land, and a lack of efficient extension services. According to Strydom (2016), these challenges are pervasive. Matlou (2018) reported that one of the most difficult challenges facing emerging dairy farmers in the Thabo Mofutsanyane district of QwaQwa in establishing commercial farms is the application of ancient cultural knowledge in a technologically advanced industry. Khapayi and Celliers (2016) contend that there are no opportunities for commercialising emerging farmers in the South African agricultural economy. The reason is that there is no robust support system to help previously disadvantaged farmers, which means that these farmers cannot take advantage of the South African government's various opportunities (Khapayi and Celliers, 2016). As noted by Chikazunga & Paradza (2012), this situation can be turned around through concerted government support. Under the previous South African government, the South African agricultural economy proliferated due to steady-state subsidies and support programs to support commercial farmers.

Government support services are essential for the commercialisation of emerging farmers. Structural, financial, and market access measures are examples of such assistance (Khapayi et al*.,* 2016). According to Meissner et al. (2013), structural support refers to national and provincial organisations that offer policy advice and a supportive national and an international market environment. Meissner et al. (2013) further argued that financial support is the foundation of any commercial enterprise. Currently, most emerging farmers cannot access loans due to various factors, the primary one being lack of land ownership as a basis for equity. These farmers also lack financial management skills. Meissner et al. (2013) also observed that effective commercialisation of emerging dairy farmers requires partnerships. The dairy sector is still engaged in a dualistic system. Commercial farmers actively participate in formal marketing channels. In contrast, emerging farmers operate on the outskirts of official

marketing channels due to a lack of knowledge of market conditions, pricing structures and marketing opportunities.

MPO (2017) stressed that commercialising emerging dairy farmers is crucial for the South African dairy industry's long-term sustainability. It is also vital for national food security and will contribute to the government's strategic goal of developing and empowering previously disadvantaged farmers. The overall achievement of developing emerging dairy farmers would be measured, among other things, by the extent to which emerging dairy farmers are upgraded from subsistence to successful commercial farming.

1.2 IMPORTANCE OF THE STUDY

This research focuses on the Free State, one of the provinces of South Africa with a significant number of emerging dairy farmers. It attempts to further the work of previous researchers on understanding the challenges influencing the commercialisation of emerging dairy farmers. The knowledge generated in this study provides the basis for developing policies and strategies to develop the emerging dairy sector in South Africa, which are informed by sound scientific research.

The current research results will also benefit governments and policy-makers by highlighting the factors that require particular focus and attention to commercialise emerging dairy farmers, while also recommending models that may be used to underpin such programmes. The knowledge generated will also serve as a guide to managing the challenges identified. In addition to developing more commercial and sustainable farming practices, emerging dairy farmers will be empowered to achieve growth and competitiveness in the South African dairy value chain.

1.3 RESEARCH PROBLEM

According to Du Plessis (2016), in the last 28 years, the South African government has established several policies and programs and increased funding for the agricultural industry to assist with the commercialisation of emerging farmers. However, there is insufficient evidence to date to show that these attempts have been

successful. Khapayi et al. (2016) noted that government programs and other efforts have increased rather than relieved the challenges emerging farmers are experiencing. Emerging farmers still live in poverty and encounter challenges transitioning into commercial agriculture. Khapayi et al. (2016) further remarked that the failure of government attempts to integrate emerging farmers into the commercial agricultural system has heightened the need for well-grounded scientific knowledge and a thorough understanding of the challenges that influence emerging farmers' commercialisation.

A better understanding of the main factors that influence the commercialisation of emerging dairy farmers is a prerequisite to adequately preparing policies, development strategies, programs and models to encourage and enhance the transition of emerging dairy farmers to commercial dairying. Several studies have been undertaken on the commercialisation of emerging farmers in general, with a view to developing an understanding of the challenges that hinder the shift from emerging to commercial farming. Despite the significant knowledge gained from these studies, there is still a notable scarcity of in-depth knowledge on factors affecting the commercialisation of emerging dairy farmers. Such knowledge is particularly essential, considering the well-known intricacies of dairy farming. This study sought to address this gap in knowledge by conducting a thorough scientific investigation on the factors influencing the commercialisation of emerging dairy farmers in the Free State Province. An attempt was also made to assess whether dairy business hub models that have been used successfully elsewhere can be applied as a vehicle for the commercialisation of emerging dairy farmers in the Free State Province. The knowledge was generated by addressing the following questions:

1. What are the challenges influencing the commercialisation of emerging dairy farmers in the Free State Province?
2. What are the opportunities for the commercialisation of emerging dairy farmers in the Free State Province?
3. What strategies can be used to assist emerging dairy farmers to become commercial farmers?
4. How can dairy business hub models help to commercialise emerging dairy farmers in the Free State Province?

1.4 RESEARCH AIM

This research aimed to identify factors that influence the commercialisation of emerging dairy farmers in the Free State Province and assess the potential of utilising dairy business hub models to address the identified factors.

1.5 RESEARCH OBJECTIVES

1. To identify and describe the critical challenges influencing the commercialisation of emerging dairy farmers in the Free State Province.
2. To identify the opportunities for the commercialisation of emerging dairy farmers in the Free State Province.
3. To recommend strategies that can be used to assist emerging dairy farmers to become commercial farmers.
4. To assess the utility of dairy business hub models that can help commercialise emerging dairy farmers in the Free State Province.

1.6 RESEARCH DESIGN

A case study methodology was used for this research. A detailed discussion of the case study methods employed, including the research questions, the research propositions made to help answer the research questions, and the data collection and analysis strategies used, are discussed in Chapter 3.

1.7 THESIS STRUCTURE

The thesis is structured into six chapters which are described below:

Chapter 1: Introduction and background of the study

This chapter provides an overview of the study as well as its significance. The problem statement informs the development of research questions. The research aim is next explained, followed by the research objectives, and the research design is then outlined.

Chapter 2: Literature review

This chapter discusses the literature on the relevant study-related subject matter.

Chapter 3: Case study research methodology

This chapter describes the case study research methodology used to conduct this study.

Chapter 4: Case study results and findings

This chapter presents the case study findings in response to the four research questions posed in chapter one. The results from the analysis of data from the semi-structured and focus group interviews are described.

Chapter 5: Discussion

This chapter discusses the case study's results and findings, as stated in Chapter 4.

Chapter 6: Conclusion and recommendations

This chapter presents the conclusions and recommendations derived from the findings described in Chapter 4. This study's contribution to knowledge is demonstrated, and possible limitations and suggestions for further research are suggested.

1.8 SUMMARY

This chapter provided context for the study and highlighted the significance of the study, the research problem, and the research objectives. The next chapter (Chapter 2) covers a literature review on the subject matter.

CHAPTER 2 :
LITERATURE REVIEW

2.1 INTRODUCTION

Literature on aspects related to the subject matter of the current study is reviewed in this chapter. The review starts with an overview of the Global, African and South African dairy industries and dairy farming in the Free State. This is followed by a discussion on the definition of emerging dairy farmers and their role in contributing to national food security. The importance of commercialising emerging dairy farmers, existing opportunities, as well as challenges to achieving this, are then looked at. Case studies on the Joint Partnerships and Dairy Business Hub Models that can be used to commercialise emerging farmers are also reviewed.

2.2 OVERVIEW OF THE GLOBAL DAIRY INDUSTRY

Milk SA (2020) estimates that there are 118 million dairy farms worldwide, with more than 59% in South Asia. According to Dohlman et al. (2021), dairy farms employ 590 million people on average, with each farm having a population of five people. A typical dairy farmer in the world milks three cows. Saudi Arabia, New Zealand, South Africa, Argentina, the United States of America (USA), and Canada have larger dairy farms. The average number of cows in a dairy herd in South Africa in 2018 was 459 (Casey, 2021).

After reaching a peak of 125 million in 2013, dairy farms have declined by 1.4%. In 2018, household farms kept 61% of all dairy animals, family farms 22%, and larger commercial farms 17% (McDonald & Mosheim, 2020). In South Asia and Africa, household farms predominate; family farms predominate in Latin America, East Asia, and the European Union (EU), while larger commercial farms predominate in Oceanic countries and USA (FAO, 2017).

Table 2.1: Average herd size of dairy herds in selected countries in 2018

Country	Average number of cows in herd (cows in herd = cows in milk plus dry cows)
Saudi Arabia	7 139
South Africa	459
New Zealand	416
Australia	274
Czech Republic	239
United States	241
Denmark	204
Israel	186
Argentina	149
United Kingdom	148
Uruguay	136
Canada	92
Uganda	2
Kenya	2
India	2

(Source: Milk SA, 2019)

FAO (2019) indicated that, despite only exporting a few other milk products, India is the world's largest milk producer and top exporter of skimmed milk powder. The United States, India, China, and Brazil are the world's top milk and dairy exporters. Until 2016, China and Russia were the world's leading importers of milk and dairy products, when both countries became self-sufficient, resulting in a global milk glut. The top milk-producing countries in the world are shown in Table 2.2 below.

Table 2.2: Production of unprocessed milk in the top ten milk-producing countries, as well as in South Africa, 2018

	Country	Milk produced (million tonnes)
1	India	201
2	United States	95
3	Pakistan	48
4	Brazil	33
5	Germany	33
6	China	29
7	France	25
8	New Zealand	25
9	Turkey	18
10	Russian Federation	17
	South Africa	3.4

(Source: Milk SA survey 2019 for South African data)

2.3 OVERVIEW OF THE AFRICAN DAIRY INDUSTRY

Louw (2013) pointed out that Africa's dairy sector can improve significantly despite being undeveloped compared to other continents. Africa has sufficient natural resources to establish a commercial and profitable dairy industry. Bingi and Tondel (2015) noted that the African dairy business has yet to become commercialised. Many countries are not concerned about supply and demand. Instead, many nations focus on subsistence farming; hence, most dairy producers are smallholder and emerging dairy farmers. The African dairy sector faces problems such as:

- Lack of extension services support on the farm level;
- Poor herd management practices and low production;
- Farmers and stakeholder organisations are poorly organised;
- Lack of access to primary and secondary services and processes along the value chain is inefficient. and
- Emerging dairy farmers lack knowledge and education.

According to Louw (2013), the above challenging issues need to be addressed to ensure the sustainable development of the African dairy industry. African smallholder and emerging dairy farmers can become commercialised and provide safe and nutritious milk and dairy products to consumers. Nonetheless, addressing the abovementioned challenges will require a collaborative effort with a shared vision.

The top ten milk-producing countries in Africa are listed in Table 2.3 below. Africa's top three producers (Sudan, Kenya and South Africa) account for 44% of the continent's total fresh cow milk production. The top five ranking countries account for 59% of whole cow milk production in Africa, while the top ten countries account for 83%. Compared to the top 10, the 43 countries outside the top ten produce comparatively less milk (FAO, 2013).

Table 2.3: Africa's top ten milk-producing countries (metric tonnes p.a.)

	Country	2005	2006	2007	2008	2009	2010
1	**Sudan**	5,480,000	5,274,000	5,292,000	5,329,000	5,366,300	**5,554,500**
2	**Kenya**	2,650,000	3,500,000	4,230,000	3,990,000	4,070,000	**5,157,000**
3	**South Africa**	2,870,870	2,970,970	3,066,000	3,137,000	3,104,000	**3,233,000**
4	**Egypt**	2,100,000	2,150,000	3,187,320	3,211,360	2,803,340	**2,901,600**
5	**Morocco**	1,400,000	1,500,000	1,600,000	1,700,000	1,800,000	**1,900,000**
6	**Algeria**	1,400,000	1,548,000	1,569,880	1,500,000	1,750,000	**1,811,400**
7	**Ethiopia**	1,150,000	1,200,000	1,250,000	1,350,000	1,400,000	**1,773,600**
8	**Tanzania**	1,386,400	1,412,790	1,422,210	1,500,000	1,604,130	**1,650,000**
9	**Uganda**	1,032,500	1,050,000	1,085,000	1,120,000	1,155,000	**1,190,000**
10	**Tunisia**	**900,000**	**957,000**	**1,006,000**	**1,046,000**	**1,048,000**	1,059,000

(Source: FAO, 2013)

2.4 OVERVIEW OF THE SOUTH AFRICAN DAIRY INDUSTRY

South Africa is Africa's third-largest producer of fresh cow's milk, after Sudan and Kenya (FAO, 2017). According to DAFF (2019), South Africa makes a minimal contribution (0.4%) to the world's milk production. In terms of agricultural production values, the dairy sector remains South Africa's fourth-largest agricultural industry. Furthermore, the dairy industry's contribution to the South African economy is critical to job creation. It employs 60 000 farm employees and provides 40 000 people with indirect jobs in the value-added milk processing and milling business (DAFF, 2019).

2.4.1 Number of dairy farmers

Over the last decade, the South African dairy industry has undergone numerous changes. The number of dairy farmers in South Africa fell by 59%, from 2 682 in January 2011 to 1 119 in July 2020 (Milk SA, 2020), and the number of new dairy farmers was about 100 (Milk SA, 2014). Table 2.5 below presents the trend in the number of producers in each of the country's Province during the period 2011-2020. Limpopo Province experienced the most significant percentage reduction in producer numbers (Milk SA, 2020).

Table 2.4: Number of dairy farmers in each Province, 2011-2020

Province	Jan '11	Jan '12	Jan '14	Jan '15	Jan '16	Jan '17	Jan '18	Jan '19	Jan '20	Jul '20
Western Cape	683	647	529	533	502	481	419	402	379	367
Eastern Cape	314	283	264	262	251	244	212	201	206	194
Northern Cape	28	21	25	14	14	7	7	6	4	4
KwaZulu-Natal	323	322	281	267	253	247	221	212	208	208
Free State	601	535	389	328	280	249	206	165	145	135
North West	386	352	233	222	181	165	135	117	100	93
Gauteng	127	126	109	100	97	98	84	83	65	65
Mpumalanga	201	164	117	94	93	87	69	56	50	47
Limpopo	23	24	14	14	12	15	12	11	7	6
TOTAL	**2 686**	**2 474**	**1961**	**1 834**	**1 683**	**1 593**	**1 365**	**1 253**	**1 164**	**1 119**

(Source: Milk SA, 2020)

2.4.2 Dairy production areas

According to Milk SA (2020), the trend toward increased milk production in pasture-based regions has continued. Milk production is concentrated in coastal areas because of mild temperatures and good rainfall, ensuring excellent quality natural and artificial pastures. The inland production areas are generally less favourable climatically for milk production. DAFF (2019) refers to dairy farming in these areas necessitating intensive and high feedlot production systems costs. Figure 2.1 below shows the contribution of provinces to milk production in South Africa in 2018.

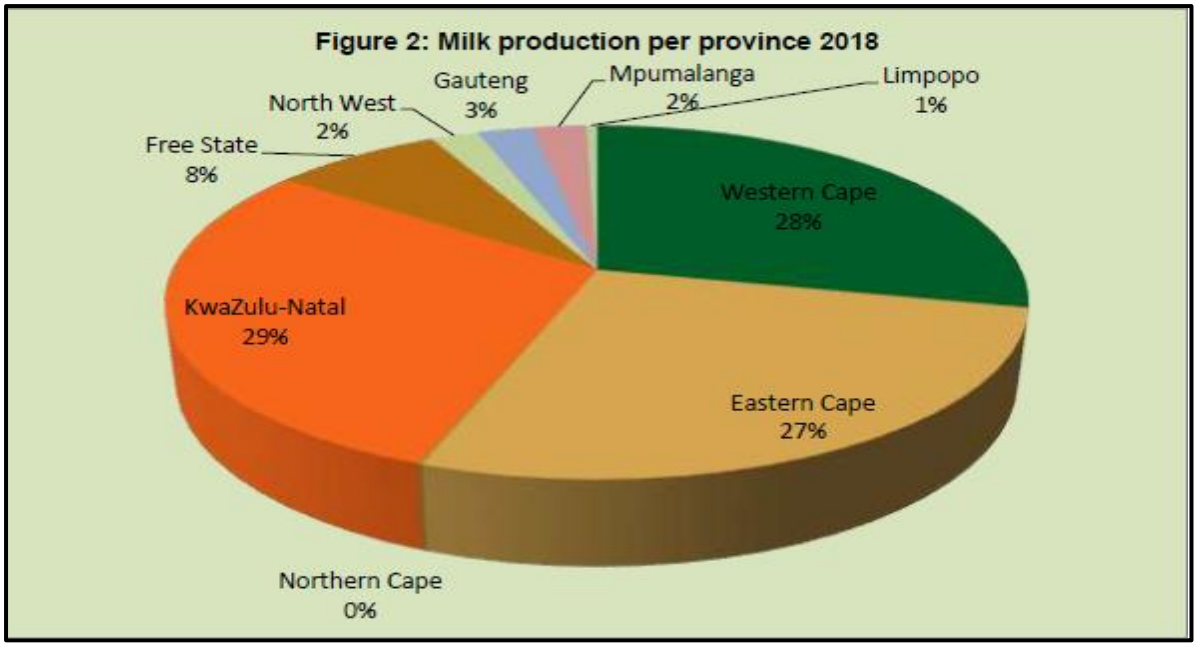

Figure 2.1: Production of milk in each Province, 2018 (Source: Milk SA, 2019)

Kwazulu Natal took the lead with a 29% contribution of the total milk produced in South Africa, followed by the Western Cape with 28% and the Eastern Cape with 27%. The Free State contributed 8%, Gauteng 3%, Mpumalanga 2%, North West 2%, while the Northern Cape and Limpopo provinces contributed less than 1% each. The coastal areas provide about 85% of the total milk production in the country (DAFF, 2019).

2.4.3 Milk production trends

According to Milk SA (2020), annual milk production has constantly increased linearly over time. The overall amount of milk sold in 2019 was 3.433 million tons, a 0.65% increase over the previous year. In the first eight months of 2020, unprocessed milk production was 0.63% lower than at the same time in 2019. Consumption of unprocessed milk increased slowly in 2019 due to agricultural economic pressures and unfavourable meteorological circumstances in certain parts of South Africa. Figure 2.2 below shows the monthly purchases from 2017 to July 2020.

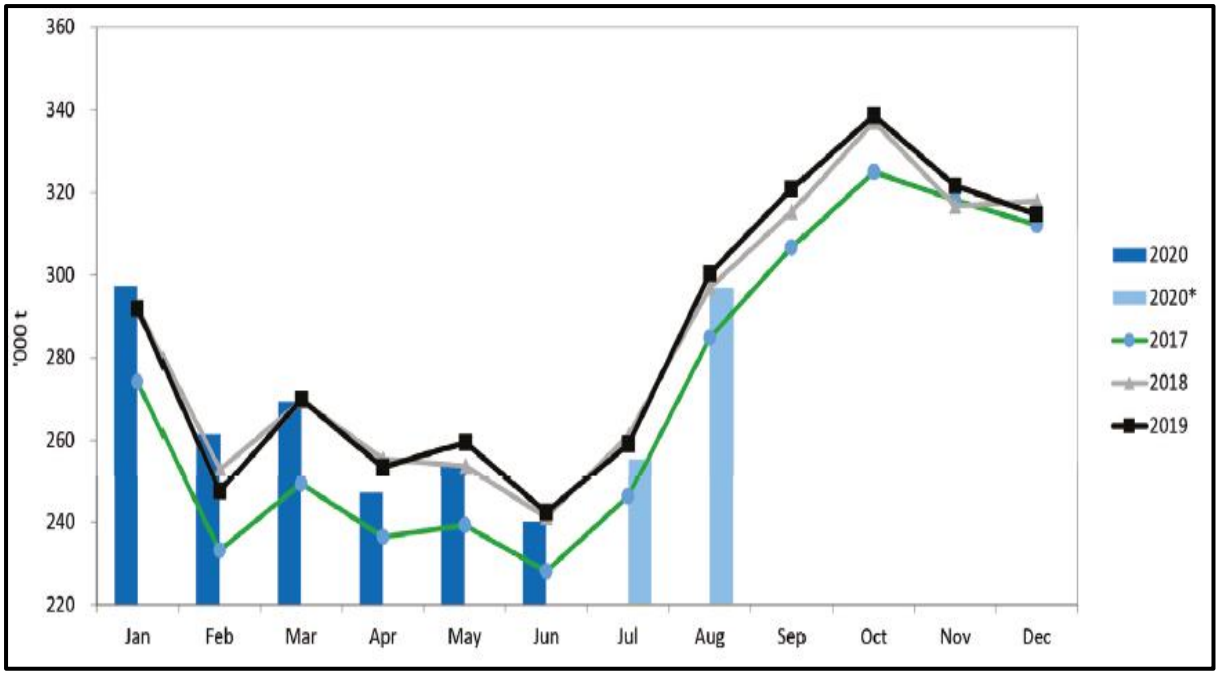

Figure 2.2: Monthly milk purchases in South Africa 2017-2020 (Source: Milk SA, 2020)

Figure 2.3 below indicates total annual milk production changes from 2009 to 2019. While the number of dairy farmers is decreasing, the total milk production still reflects an increase.

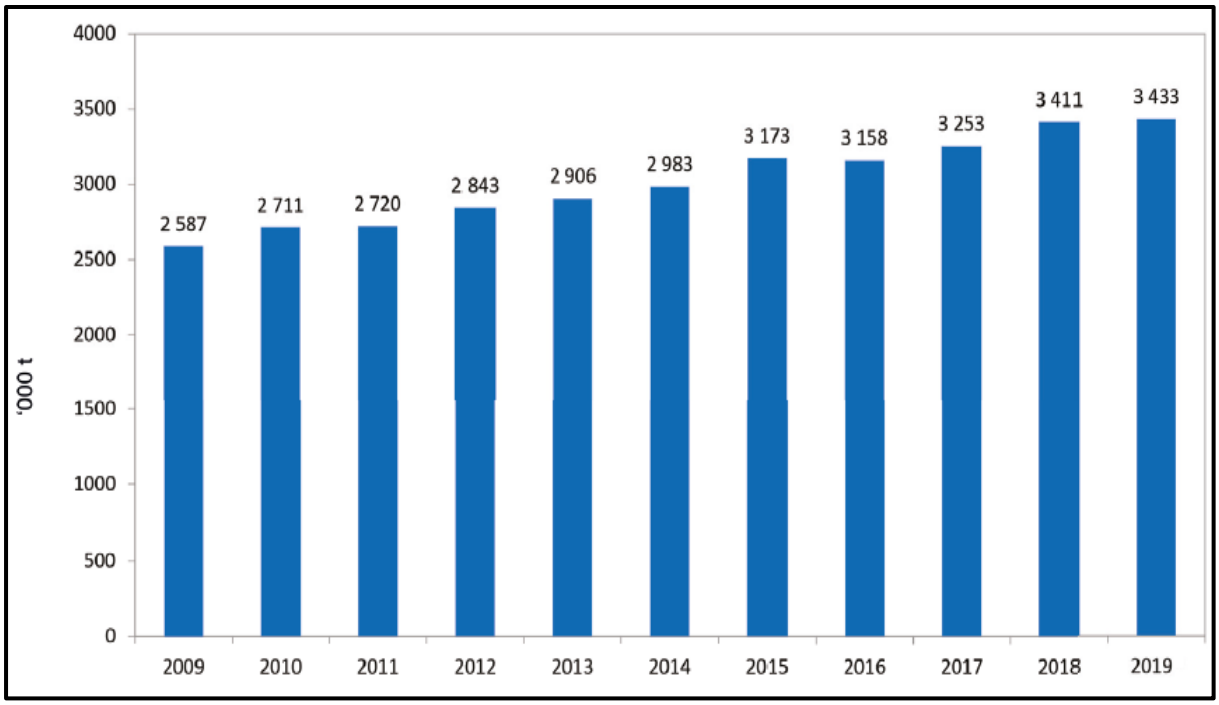

Figure 2.3: South African annual milk purchases, 2009-2019 (Source: Milk SA, 2020)

2.4.4 Structure of the market

The South African milk market comprises 62% liquids and 38% concentrates. Pasteurised liquid milk and Ultra-High Temperature (UHT) milk are the main liquid products, as seen in Figure 2.4 below. At the same time, as shown in Figure 2.4, hard cheese is the primary concentrated product (Milk SA, 2020).

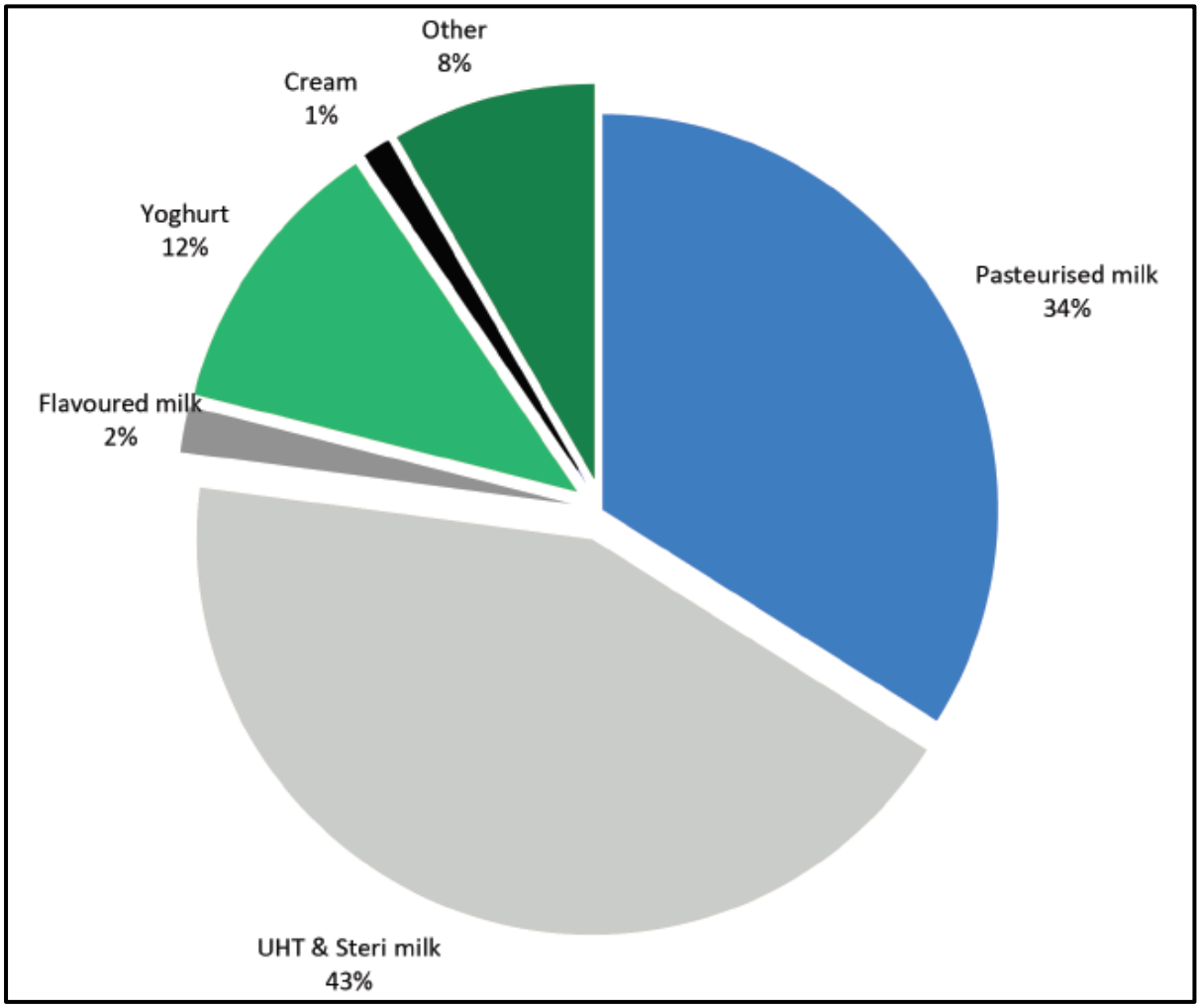

Figure 2.4: Composition of the South African liquid products market, 2019 (Source: Milk SA, 2020)

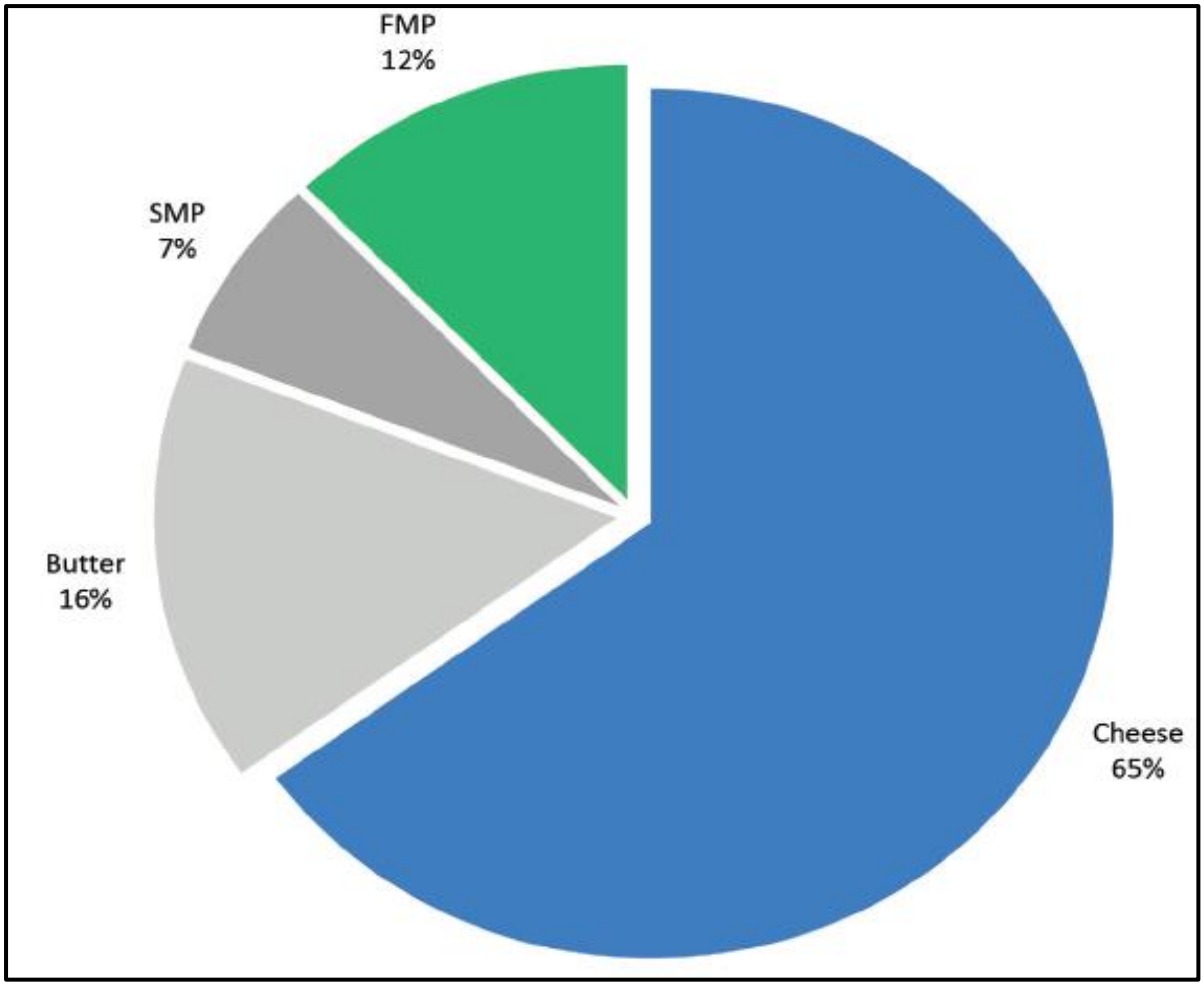

Figure 2.5: Composition of the mass market for concentrated products in South Africa, 2019 (Source: Milk SA, 2020)

2.4.5 Imports and exports of dairy products

According to DAFF (2019), New Zealand and other countries produce milk at a significantly lower cost than South Africa. Because of subsidies in these countries, imported milk from the European Union (EU) and the United States of America (USA) is less expensive than milk from South Africa. Dairy farmers in the EU are compensated for the use of specific inputs. Milk SA (2020) stated that imports totalled 75,600 tonnes in 2019, while exports totalled 45,100 tonnes. Figures 2.6 and 2.7 below show the total dairy products imports and exports.

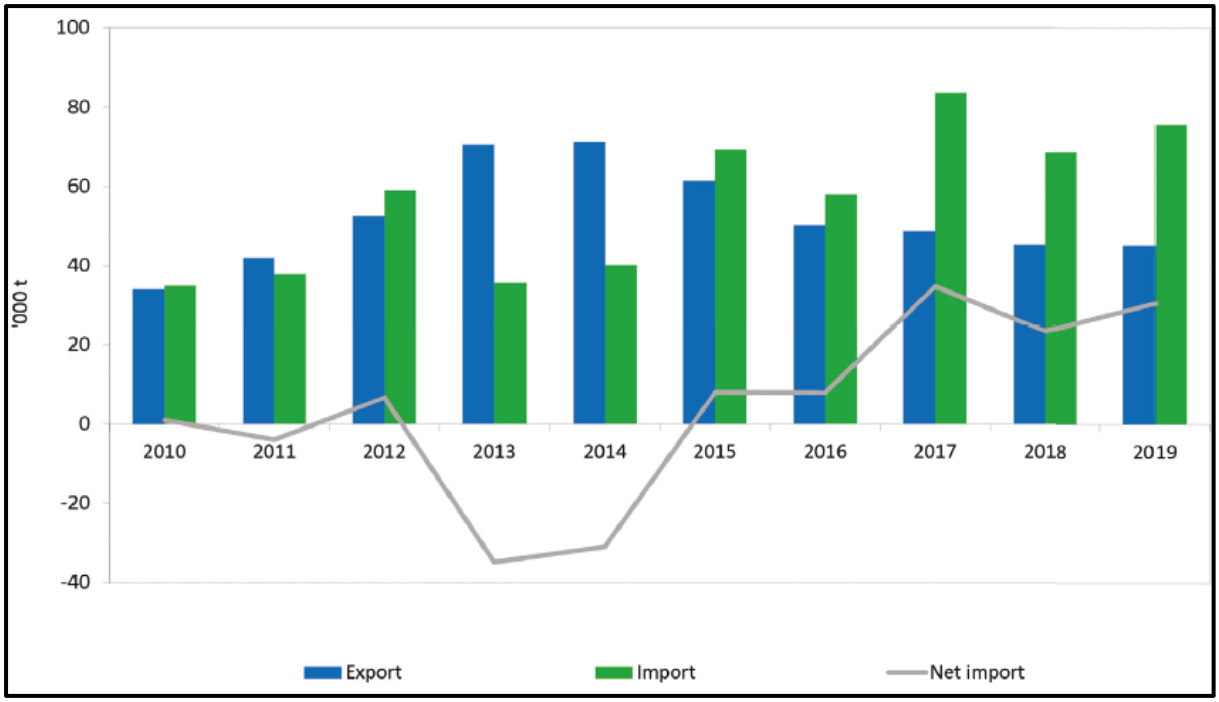

Figure 2.6: Dairy products imports and exports, 2010-2019 (Source: Milk SA, 2020)

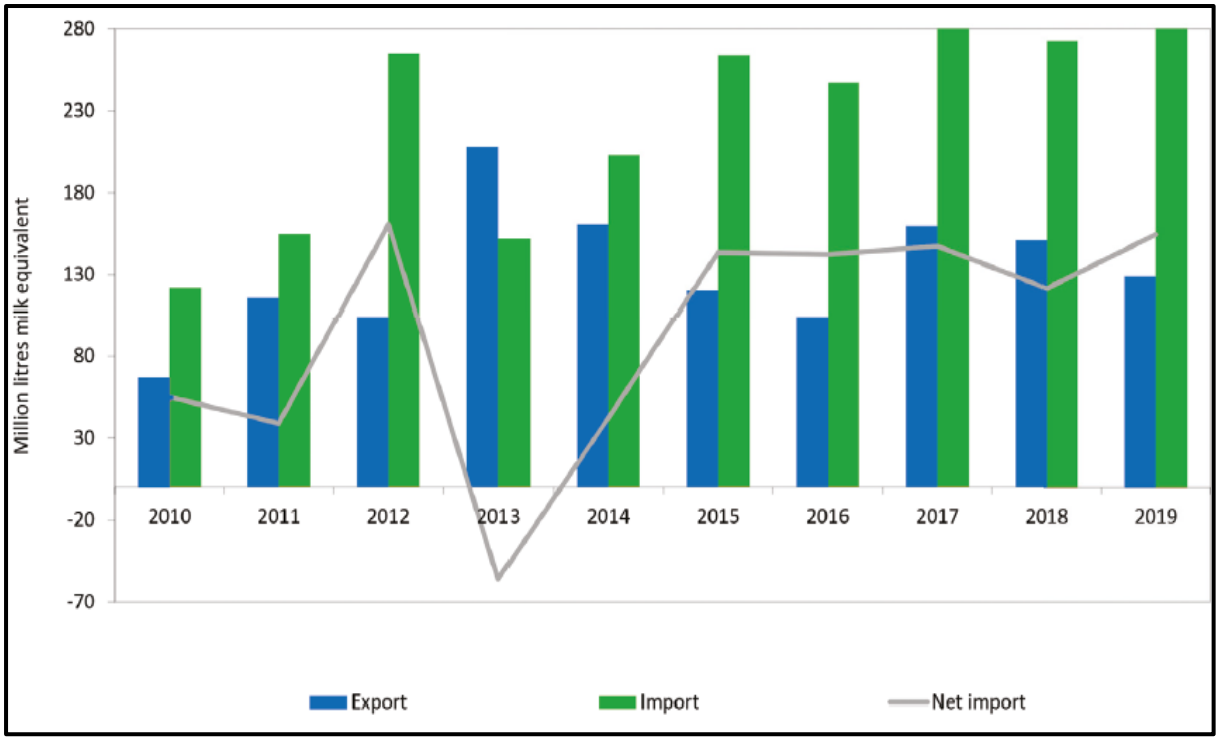

Figure 2.7: Imports and exports of dairy products on a milk-equivalent basis, 2010-2019 (Source: Milk SA, 2020)

2.4.6 Marketing channels in the South African dairy industry

The South African dairy marketing channels are summarised in Figure 2.8 below. On the production side, the sector is made up of commercial dairy farmers as well as emerging and smallholder dairy farmers. Dairy processors purchase and import milk from farmers, which they utilise to produce dairy products for primary distribution, export, and further processing by retailers (DAFF, 2019).

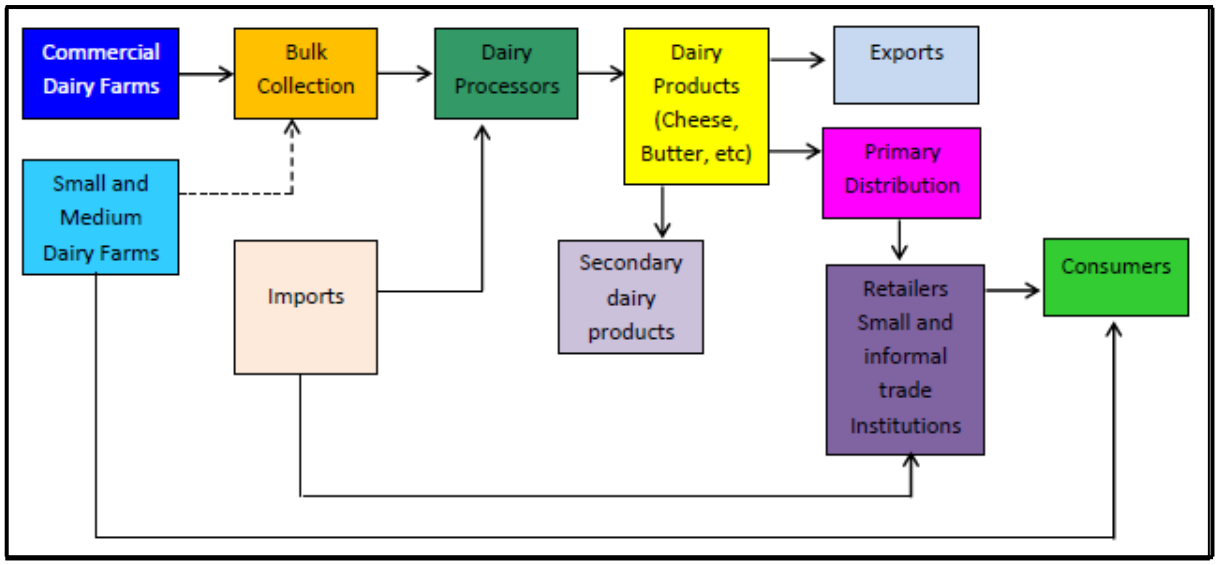

Figure 2.8: Marketing channels in the South African dairy industry (Source: Directorate Marketing, 2019)

2.5 OVERVIEW OF THE FREE STATE DAIRY INDUSTRY

According to DAFF (2019), agriculture has always been considered an important sector of the economy of the Free State Province. Therefore, the agricultural sector dominates the Free State landscape, with arable land covering about 3.2 million hectares, while natural veld and grassland cover about 8.7 million hectares. The Province produces more than 70% of South African grain from over 30,000 farms, and livestock production accounts for up to 30% of the Province's agricultural income. As a result, the farming sector can be regarded as one of South Africa's most important food hubs.

Creamer Media Engineering News (2015) indicated that the Free State dairy industry had shed many producers and workers over time. Free State dairy farmer numbers declined from 987 in January 2007 to 316 in September 2014, reflecting a 68% drop

over seven years. Table 2.6 below shows the declining trend in the number of dairy producers in the Free State, from 884 in January 2009 to 165 in January 2019. (Milk SA, 2019).

Table 2.5: Number of dairy farmers in each Province, 2009-2019

Province	Jan '09	Jan '11	Jan '12	Jan '14	Jan '15	Jan '16	Jan '17	Jan '18	Jan '19
Western Cape	795	683	647	529	533	502	481	419	402
Eastern Cape	387	314	283	264	262	251	244	212	201
Northern Cape	37	28	21	25	14	14	7	7	6
KwaZulu-Natal	373	323	322	281	267	253	247	221	212
Free State	884	601	535	389	328	280	249	206	165
North West	540	386	352	233	222	181	165	135	117
Gauteng	217	127	126	109	100	97	98	84	83
Mpumalanga	286	201	164	117	94	93	87	69	56
Limpopo	32	23	24	14	14	12	15	12	11
TOTAL	**3 551**	**2 686**	**2 474**	**1961**	**1 834**	**1 683**	**1 593**	**1 365**	**1 253**

(Source: Milk SA, 2019)

In the district of Thabo Mofutsanyana, the industry faced an immense challenge. The closure of Montic's Clocolan Milk Depot, the largest dairy buyer in the region, left about 50 dairy producers without a milk market. This is approximately 120 000 litres of daily milk that found itself without a delivery address. The Province comprises just 13 dairy purchasers, and closing the depot had tremendous repercussions for the district and province sector (Creamer Media Engineering News, 2015). The cost of inputs in the dairy industry, including electricity, coal, grain and other products, has risen dramatically in the past years. The price paid to the farmers for their milk has not been enough to compensate for these increases. Also, importing dairy products from other countries frequently subsidised by their governments harmed the local industry (Creamer Media Engineering News, 2015).

2.6 DEFINING EMERGING DAIRY FARMER

A clear definition of the term “emerging farmer” is essential for understanding the context of the current study. It is also critical because if policy-makers are interested in implementing initiatives aimed at emerging dairy farmers, such as training programmes, funding, or other policy actions, they target the correct target group. There is a danger that programs and policies will fail if the definition is too broad, not because they do not work but because they are not well established.

There is no legal definition for an emerging farmer in South Africa. However, the term is generally used to describe new entrant farmers, mainly subsistence farmers and smallholder farmers, all in one (Bank, 2018). The definition is unclear because everyone interested in farming, from former farmworkers to rural homeland dwellers to black business people, is getting land. In some contexts, the definition may include every black person engaged in agriculture (Saruchera, 2008).

Zantsi, Greyling and Vink (2019) define emerging farmers as farmers who benefited from the government's rural reform programs and rely mainly on state and semi-government organisations for funding. On the other hand, Genis (2012) describes emerging farmers as black entrants to commercial farming. Some researchers have used land size and production level parameters to identify emerging farmers (Van Averbeke, 2012).

Pienaar (2013) refers to South African emerging farmers as those who historically had limited access to the mainstream economy. Mazibuko (2013) points out that a newly emerging farmer is an individual who aims to thrive within physical, psychological and socio-economic limits and who needs the help of an external facilitator to achieve this goal.

This study defines emerging dairy farmers as previously disadvantaged farmers who currently participate in the South African dairy value chain and intend to develop into commercial dairy farmers.

2.6.1 The role and contribution of emerging dairy farmers to food security

Smallholder and emerging dairy farmers have been widely reported to play an essential role in food security, livelihoods, employment, economic growth, and poverty alleviation (Barrett et al., 2017; Muehlhoff et al., 2013; Sethi, 2018; Tull, 2017). This is particularly important in Southern Africa, where most of the population lives in rural areas (DESA, 2012; OCHA, 2021). Moreover, over 75% of the poor are smallholder and emerging farmers who rely primarily on agriculture for a living (Larson et al., 2016). Thus, the commercialisation of emerging dairy farmers is a viable tool for economic growth and improving the lives of the poor and, therefore, a cornerstone of rural development and poverty alleviation (Zhou et al., 2013).

In many households, milk provides much-needed nourishment and constant income where market outlets are available (Kumbirai, 2016). The socio-economic value of milk is highly recognised in developing countries, where it plays a major role in alleviating malnutrition and poverty. Sustainable development of emerging dairy farmers and smallholder milk processors along the value chain can increase household income, reduce losses, and create jobs in processing and marketing (FAO, 2017). Smallholder and emerging dairy farmers are a vital source of nutrition and revenue for 300 million farm families globally (Banda et al., 2021). According to the World Health Organization (WHO) (2019), smallholder and emerging dairy farmers produce most of the milk in developing countries. Furthermore, the demand for milk is predicted to grow by 25% in developing countries by 2025 (FAO, 2017), partly because of population growth and increased disposable income.

In Kenya, Wangu, Mangnus, and van Westen (2021) reported that smallholder dairy farmers dominate the milk industry, contributing significantly to many people's livelihoods. The sector accounts for 14% of agricultural Gross Domestic Product (GDP) and 3.5% of Kenya’s national GDP (Odero-Waitituh, 2017). Odero-Waitituh (2017) further noted that smallholder dairy farming in Kenya has created jobs in transportation, processing and trade and employs 35,000 full-time workers. In India, the world's largest milk producer, smallholder dairy farmers dominate the dairy industry, and more than 70 million rural households are employed in the milk processing industry (Sharma, 2015.). Smallholder dairy farmers make a living by

selling milk daily, making a significant contribution to the Indian economy and supporting the livelihoods of millions of rural families (Lindahl et al., 2020).

Undoubtedly the commercialisation of emerging dairy farmers could be part of the solution to food insecurity and poverty reduction (National Planning Commission, 2013). Provided they get the required political, financial, technical and material support, emerging dairy farmers in South Africa have the potential to develop into commercial producers and contribute significantly toward national food security (Chilenga, 2017). Lack of government support and poor access to finance are among the significant hurdles facing emerging dairy farmers in South Africa (Khapayi et al*.,* 2016). The dairy industry receives no government subsidies and is entirely subject to market forces, making it difficult for emerging dairy farmers to compete (Van Dijk, 2020).

2.7 COMMERCIALISATION OF EMERGING DAIRY FARMERS

Successful commercialisation of emerging dairy farmers requires government support, skills development, partnerships, and access to markets and finances (Meissner *et al.*, 2013). Market penetration is critical to bringing emerging dairy farmers up to commercial status (Nwafor, 2015). Policy-makers have implemented commercialisation in many developing countries, like Ethiopia (Tufa et al., 2014) and Kenya (Murithi & Matz, 2015), by increasing incomes for smallholder farmers and alleviating poverty. Muriithi *et al.* (2015) noted that market-based output leads to more benefits than living production and, thus, household consumption.

The South African dairy sector comprises two sub-sectors, namely a high-input commercial system and a smallholder or emerging sector (Meissner et al., 2013). Emerging farmers are found mainly in the areas of the former homelands (Zantsi et al., 2018). According to Khapayi et al. (2016), efforts to transform emerging dairy farmers into commercial farmers in South Africa over the past decades have not been successful. The MPO (2017) mentioned that commercialising emerging dairy farmers is critical for the dairy industry's and South Africa's agricultural sectors' future. The level of success in achieving such commercialisation would be measured by how

many emerging dairy farmers progress from emerging to commercial status (MPO, 2017).

2.7.1 Defining emerging dairy farmer's commercialisation

According to Zhou et al. (2013), the concept of commercialisation varies in application and scope, influencing its capacity. Hedin (2015) and Nwafor (2015) see commercialisation as increasing the proposition of marketed output. On the other hand, Birhanu et al. (2021) describe it as a shift from emerging to market-oriented production. Martey et al. (2012) describe the process as a progressive replacement of emerging methods with commercial ones. Zantsi et al. (2018) noted that commercial production in South Africa has generally been associated with white commercial farmers. The commercialisation of emerging farmers has mainly been understood from a restricted perspective. Khapayi et al. (2016) define the commercialisation of emerging farmers as successful participation and the ability to participate successfully in the commercial dairy value chain and output markets of South Africa. This also entails increased recognition of dairy farming as a business venture, participation in input and output markets, updating and investing in inefficient technologies, and strong formal links with other value-added dairy products.

This study defines emerging dairy farmer commercialisation as previously disadvantaged farmers who currently participate in the South African dairy value chain and intend to develop into commercial dairy farming.

2.7.2 The conceptual model for emerging dairy farmer commercialisation

Zhou et al. (2013) provide a helpful framework as a conceptual model for commercialisation to help us comprehend the notion of emerging dairy farmers' commercialisation. The drivers of commercialisation, determinants, processes, approaches, indicators, and effects, among others, are condensed into a practical framework in the model depicted in Figure 2.9 below, which is helpful for planning, implementing, and reviewing programs in agricultural commercialisation.

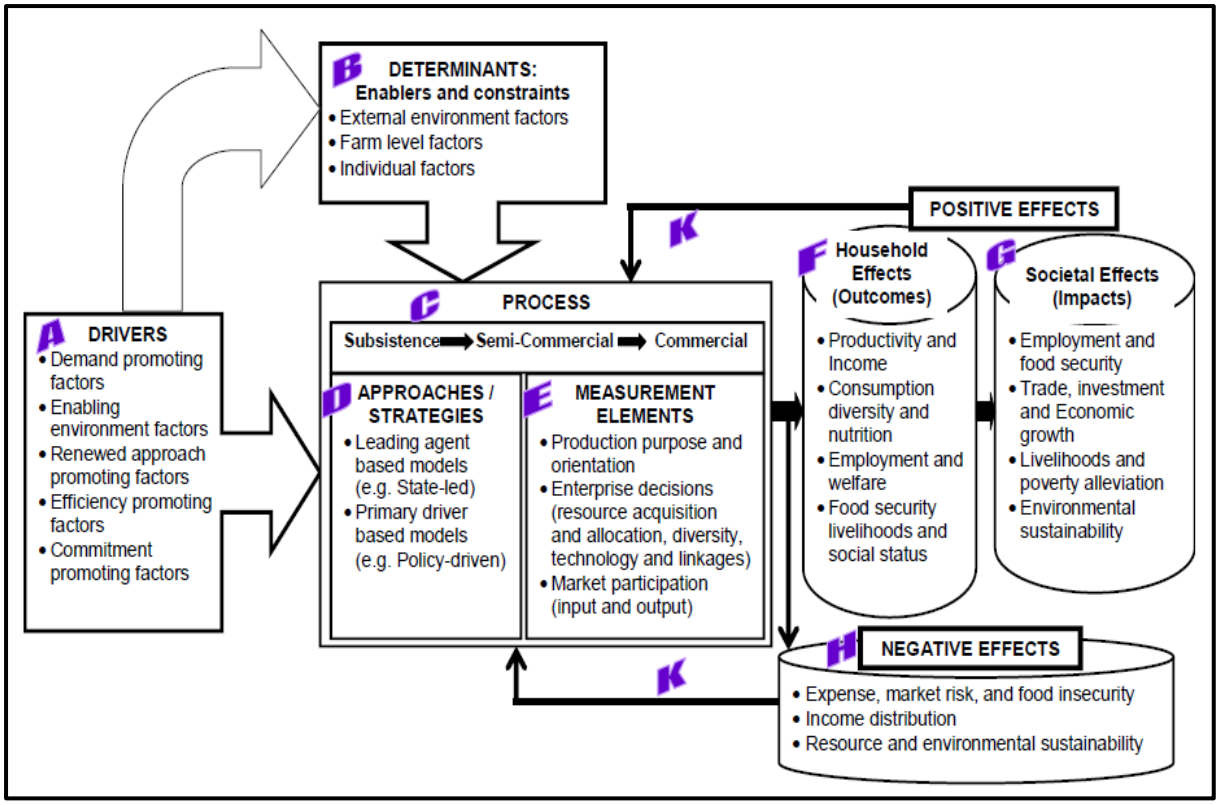

Figure 2.9: A conceptual model of agricultural commercialization (Source: Zhou et al., 2013)

Multiple factors (A) are activating the commercialisation process, as shown in the model in Figure 2.9 above, by increasing demand and enabling the environment, pushing for innovative agricultural practices, and improving farmer commitment. As emerging farmers proceed toward commercialisation, numerous environmental elements, farm levels, and individual skill determinants (B) impact the process's success or failure, the consequences of which are also controlled by drivers. Process (C) suggests that farmers gradually swap emerging approaches with commercial ones until they completely commercialise. The adopted strategy (D) emphasises important participants, essential activities, and producer duties. Most successful cases result from close collaboration since the commercialisation of emerging farmers has proven challenging without partnerships and inclusive methods (Zhou et al., 2013). According to Nwafor (2015), progress is assessed (E) by the aim and orientation of production, the character of enterprise decisions, and the level of market engagement. Finally, the effective commercialization of emerging farmers is projected to result in good outcomes (F) in household income and beneficial societal benefits (G) in food security. Simultaneously, certain unfavourable and unanticipated repercussions (H) may

develop depending on the circumstances and techniques employed. Lessons acquired from the findings are integrated into future initiatives and policies (K).

2.7.3 Application of the conceptual model

The model described in section 2.7.2 helps develop an understanding of the concept of emerging dairy farmer commercialisation by researchers, government institutions, and other stakeholders. It summarises the critical components of commercialisation and how they are interconnected to provide a condensed overview of the entire concept (Viljoen, 2020). It emphasises vital elements such as multiple drivers, the two-sided nature of determinants, strategy options, measuring elements, and the multifaceted nature of these effects. It enhances the overall planning, implementation, and evaluation of commercialisation programs. Measurement elements may also be used to commercially profile emerging dairy farmers to develop targeted strategies and interventions at various levels. The model may be used to analyse, comprehend, and compare different agricultural development programmes worldwide. It provides a framework for identifying significant challenges and lessons learnt from previous experiences (Zhou et al., 2013).

2.7.4 Enablers of commercialisation of emerging dairy farmers

The success and failure of the commercialisation of emerging dairy producers are influenced by various physical, political, economic, sociocultural, technological, and individual factors (Zhou et al., 2013). Increased natural circumstances and support for emerging farmer policies, public goods and services, subsidies, and investment incentives have been crucial to commercialising emerging farmers (Rapsomanikis, 2015; Toringepi, 2016). According to Zhou et al. (2013), significant examples of the pro-smallholder policies in Southern Africa include the agricultural reform in Zimbabwe, black economic empowerment in South Africa and tribal grazing policy in Botswana. Investing in research, extension genetics, infrastructure, marketing institutions and market incentives enabled Zimbabwe to commercialise small-scale cotton, tobacco and maize producers in the 1980s.

In Botswana, success in the beef sector has been achieved through possibilities provided by the Botswana Meat Commission [BMC], such as longer-term leases, infrastructure and input credit/subsidies training and linkage (Acemoglu et al., 2012). The achievements of the goat, sheep and horticulture sectors in Namibia are also listed in similar ways with prominent manufacturing groups, engagement by the private sector and market information (Marius et al., 2021)

2.8 CHALLENGES INFLUENCING THE COMMERCIALISATION OF EMERGING DAIRY FARMERS

This section discusses the challenges that influence commercialising emerging dairy farmers in the Free State Province. These constraints include a lack of infrastructure, access to financing, market access, milk price, dairy product importation, a lack of government support, and a lack of knowledge and skills.

2.8.1 Lack of Infrastructure

Infrastructure, such as milking parlours, milk storage facilities, electricity and water availability, was identified by Louw (2013) as the most critical issue impacting the commercialisation of South African emerging dairy farmers. According to the DAFF (2018), emerging dairy farmers lack the financial resources to invest in dairy equipment. The amount of milk they produce is insufficient to warrant investment in capital equipment. The formation of co-operatives may assist in resolving this problem by increasing the amount of milk collected. Musitini and Muroiwa (2019) stated that the most severe infrastructural obstacle affecting smallholder and emerging dairy farmers is the road transport system, which is critical for market development and distribution of inputs and products to and from farms.

Sikwela (2013) also indicated that smallholder and emerging farmers do not receive enough infrastructural support from the South African government. Smallholder and emerging producers rely on inefficient modes of transportation, especially animals, due to weak road networks. Furthermore, According to Migose et al. (2018), Kenya's poor rural roads and other critical physical infrastructure have resulted in high

transportation costs for smallholder dairy farmers' commodities to the market and farm inputs, reducing farmers' competitiveness.

2.8.2 Access to finance

According to the International Finance Corporation (2014), financial access is a frequent problem for African smallholder and emerging farmers, limiting their contribution to the agricultural economy. Swinnen and Kuijpers (2020) stressed that financing smallholder and emerging dairy farmers is crucial in achieving pro-poor growth and reducing poverty. The MPO (2017) stated that almost all emerging dairy farmers find it difficult to secure finance for their farms. Louw (2013) further noted that lack of access to funding makes it difficult for emerging dairy farmers to invest in milking parlours and good breeding practices, thereby hindering their commercialisation.

Sebola (2018) pointed out that the lack of clear land rights is a barrier to obtaining finance. Many emerging dairy farmers do not own their land; instead, they are granted permission to use it. They cannot use their land security for financing because they do not have clear land rights. Sebola (2018) further highlighted that, despite the promises of post-apartheid land reforms, access to land ownership remains a challenge for emerging black farmers. South Africa is still trying to keep its promise to black beneficiaries of agricultural land.

2.8.3 Access to markets

Problems of smallholder and emerging farmers' market involvement in developing countries are well documented in the literature. According to Obi et al. (2012), market access is a significant determinant of whether emerging farmers transition to commercial farming. Musitini et al. (2019) noted that smallholder and emerging dairy farmers struggle to enter traditional agricultural markets. Meissner et al. (2013) observed that while commercial farmers actively participate in formal marketing channels, emerging farmers operate on the outskirts of official marketing channels due to a lack of knowledge of market conditions, pricing structures and marketing opportunities. Market shortages are a common feature of emerging farmers in

developing countries, and Khapayi et al. (2016) noted that this is a constraint to the growth of emerging farmers. Low levels of commercialisation among smallholder dairy producers in developing countries can be attributed to a lack of access to efficient, competitive and inclusive markets (Arias et al., 2013). Mtimet and Pica-ciamarra (2016) have identified high transport costs, information gaps and weak institutional support systems as major barriers to emerging dairy farmers in developing countries participating more actively in the mainstream market.

Wiggins and Keats (2013) highlighted remoteness, low productivity, low prices, and a lack of market information as the four major barriers to smallholder dairy farmer participation in markets in a study on linking smallholder dairy farmers in Sub-Saharan Africa to markets. According to the World Bank (2017), the poor state of Zimbabwe's roads, geographical and institutional isolation from markets, and a lack of suitable vehicles push up marketing costs, deterring farmers from commercialising their produce. Some studies have noted that market participation by smallholder and emerging dairy farmers is a path to commercialisation, which leads to poverty reduction, improved livelihoods and economic development in rural areas (Musitini et al., 2019; Poole, 2017).

2.8.4 Milk price

According to the DAFF (2018), emerging and commercial dairy farmers in South Africa operate in an uneven market structure controlled by four major milk processors, making participation in the dairy value chain difficult for emerging dairy farmers. Emerging dairy farmers are forced to accept whatever price the processors offer because of the dairy industry's pricing dynamics and the product's shelf life. Bunce (2020) observed that the processor does not consult dairy farmers and organisations to determine the milk price. Milk SA (2019) further stated that there was a 65% drop in the number of dairy farmers between January 2009 and January 2019 due to low milk prices. Furthermore, the number of emerging dairy farmers decreased in South Africa following the dissolution of marketing control boards in 1997 (Milk SA, 2015). Due to economies of scale, processors have amended their procurement patterns after deregulation and started buying less from smallholder and emerging milk

producers. This has reduced the contribution and effectiveness of emerging dairy farmers in the economy (Mbanjwa, 2016).

2.8.5 Importation of dairy products

Imports have resulted in low producer pricing, making it difficult for emerging dairy farmers to break into the market. Milk produced in New Zealand and other nations is cheaper than milk produced in South Africa, while milk imported from the EU and the USA is cheaper than milk produced in South Africa due to subsidies in these countries. The countries pay an allowance to dairy companies to bridge the gap between the supported local price and the world market price (DAFF, 2018). Louw (2013) mentioned that imports of dairy products threatened the livelihoods of Zambia's smallholder dairy farmers. Dairy goods from European Union countries have found their way into the Zambian market at lower prices than Zambian farmers can produce the product. Louw (2013) further mentioned that agricultural policy has evolved during the past decade to strengthen trade obstacles, preventing cheap dairy products from entering Zambia.

2.8.6 Lack of government support

Khapayi et al. (2016) contend that emerging farmers have no opportunities in the South African agricultural economy. There is no robust support system to help previously disadvantaged farmers, which means that these farmers cannot take advantage of the South African government's various opportunities (Khapayi et al., 2016). On the other hand, Chikazunga and Paradza (2012) indicated that under the previous South African government, the South African agricultural economy proliferated due to steady-state subsidies and support programs to support commercial dairy farmers. MPO (2017) points out that healthy competition is a given in every free-market economy. Nonetheless, South Africa's dairy industry is unusual in that it receives little, if any, government support. This, the industry has to fight with overseas competitors in a highly competitive global market. This is a challenging environment for emerging dairy farmers to survive.

2.8.7 Lack of knowledge and skills

Several studies have indicated that emerging dairy farmers lack knowledge and skills in dairy farming (Mahlokoane, 2012; Matlou, 2018; Tanyanyiwa et al., 2017; Ziad, 2018). One of the main factors that have been identified as limiting the commercialisation of emerging dairy farmers is the lack of knowledge and skills in feeding and breeding programs, milk quality and other aspects of farm management (Louw, 2013). According to Tanyanyiwa (2016), the dairy industry is complex, and emerging dairy farmers do not have the necessary skills and expertise. Most of them are uneducated and have little access to information on the technical aspects of the dairy industry.

The shortage of several essential skills among emerging farmers has been identified as a significant growth constraint (Khapayi et al., 2016). Mtombeni et al. (2019) noted that emerging farmers are still using old cultural practices in an industry that has become technologically advanced. Furthermore, Wainaina (2013) further established that emerging dairy farmers still face technological challenges. Most of them use old technology, which is inadequate to meet market demands. Mbanjwa (2016) discovered that most smallholder dairy farmers in Zambia are characterised by illiteracy and outdated technologies. Being illiterate with limited technical abilities can significantly limit access to helpful and formal institutions that distribute technology knowledge. In South Africa, it has been noted that most smallholder and emerging dairy farmers lack financial and marketing capabilities (DAFF, 2018).

2.9 OPPORTUNITIES FOR THE COMMERCIALISATION OF EMERGING DAIRY FARMERS

According to DAFF (2018), the South African dairy sector profitability is determined by the quality of the product and the relationship between producers and processors. As a result, partnership along the dairy value chain is crucial. The DAFF (2018) further indicated that the demand for milk exceeds the supply in South Africa, creating opportunities for emerging dairy farmers to enter the market for fresh milk. Analysts predict that the demand for raw milk will rise consistently as the economy expands.

Emerging dairy farmers may sell their milk directly to small cafes and street sellers, shortening the value chain by lowering transaction costs and improving earnings. Sour milk, yoghurt and cheese are high-value-added products that may be marketed through this channel. This channel would, however, necessitate substantial funding and involve high risk (DAFF, 2018).

In South Africa, the number of emerging dairy producers has expanded considerably since deregulation, and indications are that processors are prepared to buy milk from emerging producers (DAFF, 2018). Nonetheless, this distribution channel will necessitate strict control measures on hygiene, which the producers must comply with. However, taking this option will require significant expenditure, industry expertise and planning. Packaging that promotes brand recognition has the potential to open doors for emerging dairy producers, but it will need market research, knowledge, training, and investment.

2.10 DAIRY BUSINESS HUB MODELS

Dairy Business Hub Models (DBHM) are an example of inclusive enterprises that contribute to a "new method of organising the dairy industry for smallholder dairy producers, inclusive innovation." This approach is widely employed in East Africa and Pakistan to promote the growth of the dairy sector. Jaleta et al. (2013) define DBHM as a single business unit that provides inputs and services in a specified geographic region to suit the needs of beneficiaries. These diverse entities might be private, cooperative, or publicly held. They may or may not cooperate in the operation of their business.

The DBHM have also been developed in response to the marketing potential as a solution to the dairy market problems of the smallholder dairy farmers and even the need for training, services and supplies to improve agricultural productivity (Omolo 2012). Van der Lee et al. (2018) observed that the DBHM could increase smallholder dairy producers' input and output selling prospects. Transactions can be decreased, and smallholder dairy producers can access more formal traditional markets by connecting multiple supply chain actors to the DBHM. Profit increases from economies of scale, simplicity of business and negotiating strength are all expected benefits for smallholder dairy producers. Input providers, service providers and processors can

benefit from DBHM by taking advantage of collaborating with large groups of smallholder dairy farmers in a cost-effective manner.

Van der Lee et al. (2013) noted that the DBHM might be improved so that farmers can become sustainable after the initial investment in capacity growth, facilities and equipment. Transaction costs are projected to decrease with a consolidated service centre, and supply and demand would be more balanced. Moreover, farmers may obtain extra bargaining power, and the method of check-off helps them use resources until revenue is available. Service providers and input providers can then attract more consumers and provide improved payment protection. The expected indirect effects of developed DBHM are to reduce the sector's transaction costs due to increased effectiveness and increased availability of better services and inputs through trading volumes and quality.

An excellent example of the DBHM is the East Africa and Pakistan Dairy Business Hub Models. This application of a Dairy Business Hub model demonstrates the need for collaboration among various stakeholders to commercialise emerging dairy producers in the Free State Province and other provinces in South Africa.

2.10.1 East Africa Dairy Business Hub Model

According to Rao et al. (2016), Dairy Business Development Model (DBHM) was implemented by East Africa Dairy Development Program (EADDP) in collaboration with five organizations: Technoserve, American Breeders Society (ABS), International Livestock Research Institute (ILRI), Heifer International, and International Centre for Agroforestry Research (ICRAF). Omolo (2012) explained that it promotes actions that boost productivity, competitiveness, product quality, and farmer support services in areas capable of expanding dairy markets and farmers' access to markets. EADDP bridges this gap with a dairy business hub model. Omolo (2012) observed that the chilling plant, Agro vet shop, finance facility, feed, and artificial insemination are part of the dairy hub business model, a dynamic cluster of services and activities that provide increased incomes for smallholder dairy farmers. Figure 2.10 below displays the EADDP dairy hub model.

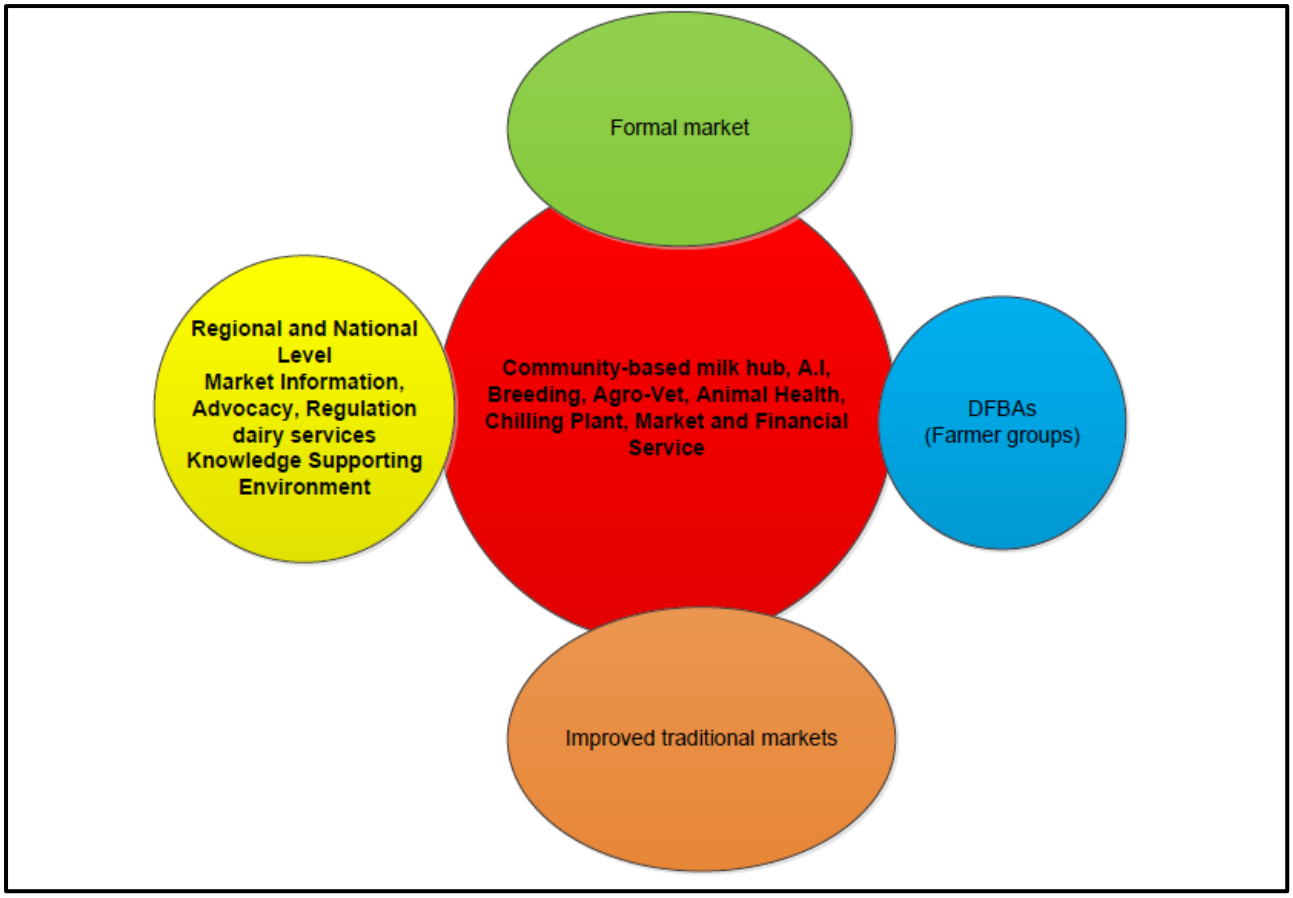

Figure 2.10: EADDP Dairy Hub Model (Source: USAID, 2012)

Omolo (2012) further observed that the chilling plant was at the heart of this functional unit, which generated an organised milk collecting system that eventually disintegrated due to Kenya Cooperative Creameries (KCC) poor performance in the 1990s, leaving an unpredictable milk collection system controlled by dairy farmer co-operatives and farmer groups. The functional milk collection centres are currently run by dairy co-operatives, milk processors, and private milk transporters (Chepkoech, 2012).

The dairy hub business model, which is solely owned by smallholder dairy farmers and managed by skilled management, was reported by Kathotya (2012) as having successfully transformed the dairy industry. It is usually headquartered in villages or regions that have become innovation hotspots, and it is aimed at earning profit for the producers. Twenty-one dairy centres in Kenya collect 77 million kg of milk each year, generating Ksh 21.6 billion, of which Ksh 16.9 billion is paid to smallholder dairy farmers.

The dairy hub business model's advantage is its capacity to address the problems that smallholder dairy farmers experience, such as lack of access to breeding services, feed, animal healthcare, production inputs, and appropriate information (Kathotya, 2012). Farmers are organised into groups to increase milk volumes. It thus gives them a competitive and negotiating edge and access to low-cost extension services, transportation, agro-vet, feeds, profit, competitive pricing, and loans and credit. The hub enlists the help of young people to provide transportation for farmers who live far away from the chilling facility, removing the burden of transportation from the farmers and allowing them to focus on their core business.

Omolo (2012) noted that the hub is a cost-effective way to conduct business. Freezing and bulking milk adds value to purchasers, resulting in a competitive advantage that may be measured by where it fits in the value chain. The efficiency with which it accomplishes this is determined by its logistics, which may be demonstrated using Michael Porter's competitive advantage principles (see figure 2.11 below).

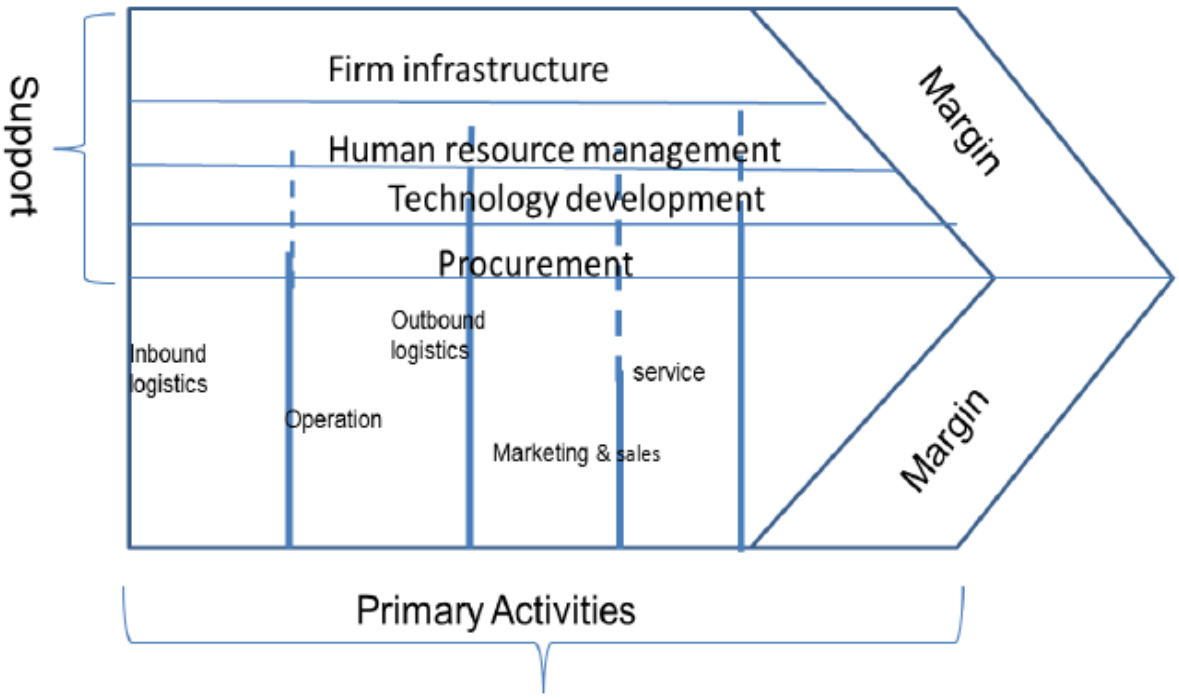

Figure 2.11: The business unit value chain is depicted in this diagram (Source: Omolo, 2012)

Each of the DBHM's major support activities, such as collecting, transportation, recording, chilling, and quality control, has the potential to generate marketable

products and services that meet or exceed the buyer's expectations, including massive volumes and cooled milk (Omolo, 2012).

2.10.2 Pakistan Dairy Business Hub Model

Pakistan is the world's fifth-largest milk producer, and its dairy industry shares many characteristics with Africa. The dairy industry in Pakistan is also experiencing supply/demand issues, with most milk moving through informal markets. TetraPak, Egro Foods and DeLaval have all worked to promote the development of Pakistan's dairy industry. They created the Dairy Business Hub Model (DBHM) to solve critical quality, quantity and market access issues. They have successfully boosted the Pakistani dairy business due to their collaboration (Tahir et al., 2019).

Mumtaz, Hemani, Hameed and Gulzar (2011) refer to the Community Dairy Development Program (CDDP) as a one-herd model in which milk production is controlled by smallholder dairy producers from 20 communities within a 15-20 km radius. Dairies operating in the region collect milk from smallholder dairy farmers that are part of the dairy hub. According to Mumtaz et al. (2011), the primary goal of dairy companies is to boost milk production in rural areas by increasing smallholder dairy farmer capacity and evaluating animal production success. Tetra Pak's dairy hub program attempts to improve the quality and quantity of milk supplied by smallholder dairy producers by treating their cows as a single herd. This system has allowed precise livestock recording, breeding/genetics, milk production and quality and quantity development in rural economies. It also laid the groundwork for improved traceability and compliance with Pakistani Quality Standards. The organisational structure and operations of the Pakistani dairy hub are discussed in more detail below.

2.10.2.1 Dairy hub infrastructure and technology

Dairy hubs are made up of a central facility that is promptly refrigerated, milk testing equipment, quality control and data gathering systems for all registered farmers, and veterinarian and training facilities. Also established are community veterinary hospitals, mobile clinics, and vaccination campaigns. The dairy hub program's training component is critical. In partnership with DeLaval, the Livestock and Dairy

Development Board, and the University of Veterinary and Animal Sciences, Tetra Pak organized training and capacity-building programs throughout the introduction of dairy hubs (Mumtaz et al., 2011).

2.10.2.2 Dairy hub operations

Mumtaz et al. (2011) explain that the Tetra Pak milk hub program operates from a central building to easily access Village Milk Collection centres (VMCs). For every village, there is a collection centre in the milk hub. Each village milk collecting centre has approximately 100 smallholder dairy producers, each with an average of 5 milking cows. The centres are positioned such that the farmers who give milk to the VMC are close by to avoid milk deterioration during transportation, which can take up to two hours. As additional producers join the Dairy Hub, new producer groups will be formed, and new village milk collection locations will be established to keep VMCs near the producers. From 6 a.m. until 10 p.m., the VMC points are open.

According to further details by Mumtaz et al. (2011), a milk recording agent is assigned to collect milk from smallholder dairy farmers at the Village Milk Collection Center (VMC) after performing the required quality tests with a Lacto Scan, which tests fat, SNF (solid non-fat), density, protein, lactose, water adulteration, temperature, freezing point, conductivity and pH of milk purchased from farmers. Furthermore, regular random examinations are carried out to ascertain the total number of bacteria. After routine quality control, the milk is placed into a refrigerator and refrigerated to around 15 degrees celsius. A field service executive is also assigned to each village milk collection centre. Through frequent on-farm visits, the field service provides continuous training and support to registered farmers in the field. Smallholder dairy farmers are encouraged to use the proper animal and hygiene standards taught during training by field service managers.

Mumtaz et al. (2011) observed that these Village Milk Collection Centers strive to gather high-quality milk in large quantities. The milk collected from the VMCs is delivered daily in insulated tankers to the central dairy centre. Using milk collection tankers, a Mobile Milk Tester (MTT) gathers milk from VMCs and milk collection centres. MTT is in charge of milk volume accuracy, quality, and analysis and daily meets with milk collection drivers. Before being accepted from the MTTs, milk is

inspected for quality once more in the central facility. Before being transported to the plant, the milk received at the dairy hub office is immediately cooled to 3-4 degrees celsius for storage in insulated tanks. Before it is accepted for processing, it is tested once more. The entire chain of events takes eight hours from cow to rapid cooling at the Dairy Hub. Figure 2.12 below depicts the dairy hub and village milk collection point models.

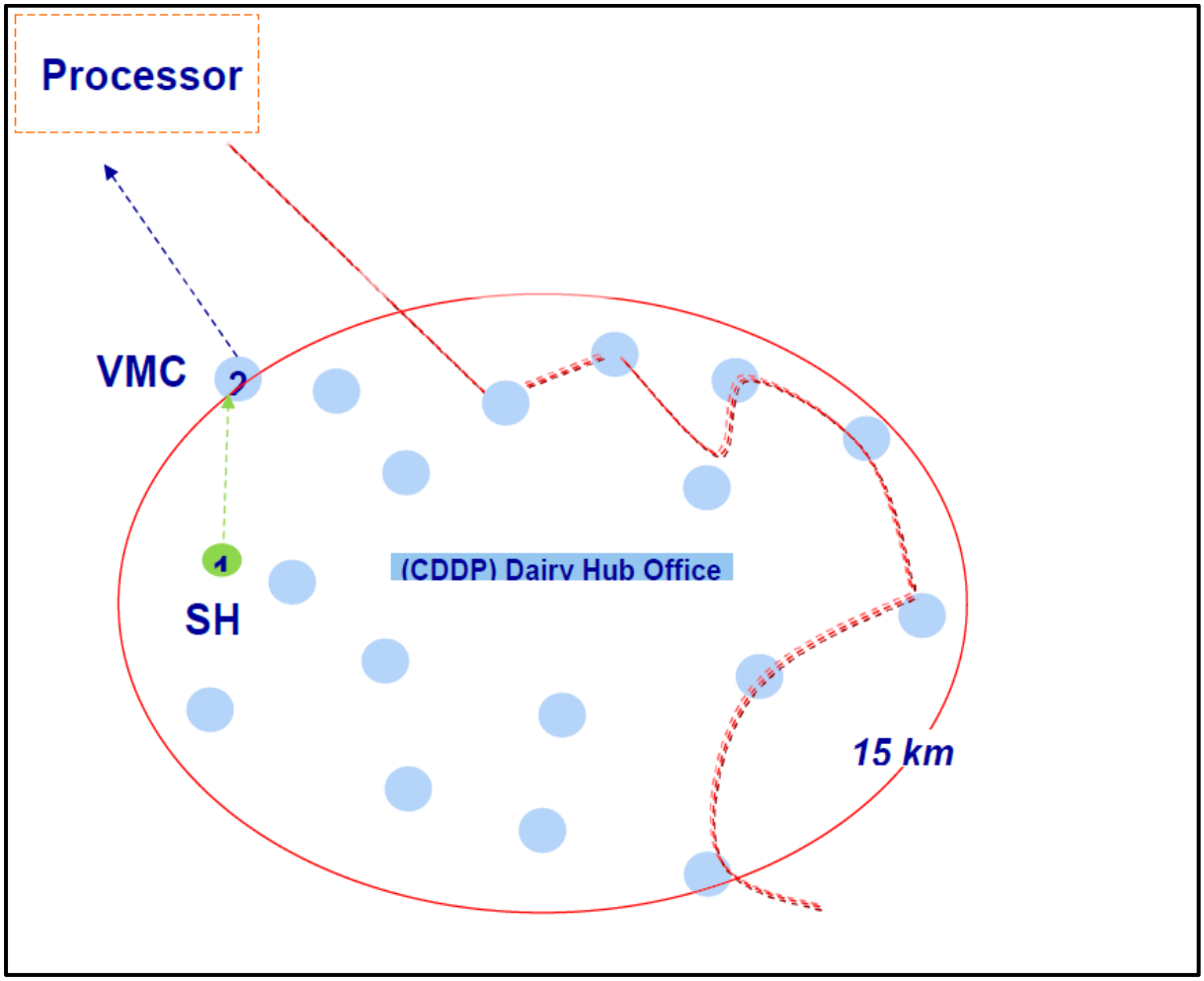

Figure 2.12: Dairy hub and village milk collection point model (Source: Mumtaz et al., 2011)

The Central Dairy Hub Office has reformed several other functions besides receiving, testing, cooling and dispatching milk. It ensures that smallholder dairy farmers are adequately trained in animal husbandry and nutrition, that veterinary medical facilities are available, that animal feed is enriched and preserved, that the breed is improved through artificial insemination, that clean water is available 24 hours a day, that mechanised milking improves yield per animal, and that software is available to

monitor milk development and improve smallholder profitability. The Dairy Hub Office hired a Dairy Hub manager, one veterinarian, one quality controller, and a finance controller to ensure smooth operations (Mumtaz et al., 2011).

2.11 CASE STUDIES: JOINT PARTNERSHIPS

The case study partnership examples below demonstrate the necessity of collaboration among various stakeholders in successfully commercialising emerging dairy farmers in the Free State Province and other provinces in South Africa. These are the initiatives conducted in the Free State Province by Sasol and Nestlé Agri-BEE to help commercialise emerging dairy farmers.

2.11.1 Case Study A: Sasol Training Programme

A lack of skills and knowledge distinguishes emerging dairy farmers in South Africa. This case study was chosen to demonstrate that collaboration in the dairy business is critical for the commercialisation of emerging dairy farmers.

The promotion of long-term growth is key to Sasol's approach to corporate social investment. The development of skills and the creation of new jobs are critical to the growth of the South African economy and the advancement of community socio-economic development (Sasol, 2006). Approximately 30% is spent every year on initiatives to enable more South Africans to lead economically independent lives in the entire company's social investment budget. Knowledge and skills transfer is an essential part of the transformation of agriculture and is the foundation of a successful land reform programme. Sasol assisted emerging dairy farmers in Qwaqwa's Thabo Mofutsanyane District in 2006. The corporation contributed R120 000 to the Milk Producers' Organisation (MPO) training program for new dairy farmers. The Intervet MPO Institute for Dairy Technology oversaw the Skills Development Program, which provided training and mentorship to 50 farmers to help them gain a competitive advantage in the dairy industry (Sasol, 2006).

One of the significant challenges emerging dairy farmers face in creating commercial and sustainable farms is applying their old cultural farming knowledge in a high-tech industry. The mentorship program provided support and practical experience for

emerging farmers to navigate the countryside of modern dairy industries and ensure sustainable and long-term productivity. Training programs managed by the MPO aimed to instil practical knowledge in the participants (Sasol, 2006).

Approximately 70% of program time and content focused on practical experience, supported by 30% on theory. A wide range of topics covered all aspects of dairy farming, including the planning of feed flow, food safety and animal health in a step-by-step approach. The program also focused on transferring entrepreneurial and business skills, ensuring that farms remain sustainable and have sufficient market access. The MPO mentoring and training program for emerging farmers was developed in consultation with the black economic empowerment objectives of the Ministry of Agriculture and is accredited by AgriSeta (Sasol, 2006).

2.11.2 Case Study B: Nestlé Agri-BEE

The following case study is another example of a company that engages all key stakeholders and adheres to the government's focal point. Nestlé announced in 2006 the signing of a two-year public-private collaboration with the Independent Development Trust (IDT) to develop the quality and quantity of milk output of 40 emerging dairy farmers in the Free State Province's Thabo Mofutsanyane district. Nestlé is the area's top milk buyer (Bizcommunity, 2006).

The Nestlé emerging dairy farmer initiative saw collaboration on various initiatives, including attempts to access infrastructures such as electricity, water, and roads and provide technical resources and enterprise development skills to enable producers to compete in the market. Nestlé created shared value by buying milk from these producers and helping them obtain funding, marketing opportunities, milk tanks, dairy infrastructure, milk transportation and veterinary services to ensure their herds are healthy and certified (Bizcommunity, 2006).

Emerging dairy farmers face significant obstacles as a result of apartheid-era planning. The project's goal was to find a strategy to ensure emerging dairy farmers' commercialisation and long-term development, in line with the government's agriculture sector plan. The IDT has 16 years of development experience and a proven track record assisting clients and partners. Its main goal was to provide

underprivileged communities with access to resources and help them realise their full potential to consistently improve their quality of life. This is ideal for the farmers' and their families' requirements, and the farmers will be able to compete with more established commercial dairy producers (Bizcommunity, 2006).

2.12 SUMMARY

This chapter included a literature review on the study's research questions. First, the dairy sector was reviewed Worldwide, in Africa, South Africa, and the Free State Province. Second, the definition of emerging dairy farmers and their contribution to food security were examined. Third, the chapter explored the commercialisation possibilities for emerging dairy farmers and the challenges and opportunities that drive their commercialisation. Finally, the chapter reviewed the Dairy Business Hub Models and the case studies on joint partnerships. The next chapter discusses the research methodology used in the study.

CHAPTER 3 :
CASE STUDY RESEARCH METHODOLOGY

3.1 INTRODUCTION

The case study research methodology utilised to conduct this study is described in this chapter. Details of the research design, questions, and propositions are provided. Other case study features, such as study area, participant selection, case study descriptions, data collecting techniques, data analysis, and ethical issues, are also discussed in detail.

3.2 RESEARCH DESIGN

The research design is a logical framework that guides the research process. The research design's primary purpose is to avoid a situation where the evidence fails to answer the research questions. In other words, the research design aims to ensure that the research questions are responded to as effectively as possible within the research's resource limits. This framework helps the researcher to structure the collection, analysis and interpretation of relevant data (Yin, 2014). The research design for this study included both qualitative and quantitative research methods. According to Yin (2018), case study methods can be used in qualitative, quantitative and mixed methods research.

3.2.1 Case study research

A case study is one of the various research methods used in social science research. It seeks to comprehend humans in a social environment by understanding their behaviour as a single group or community (Harrison et al., 2017). Thomas (2021) defines a case study as an investigation to answer specific research questions that seek additional evidence from the case scenarios. Yin (2018) describes it as an empirical inquiry that investigates a contemporary phenomenon inside its real-life context, especially when the boundaries between phenomenon and context are not

clearly defined. Yin's (2018) concept emphasises one of the most critical aspects of case study research: the importance of context.

Case study research is primarily exploratory and is utilised to understand the issue in real-life contexts (Maxwell, 2012). This research strategy was chosen for this study primarily because of the high quality of case study research. According to Yin (2014), case studies are the preferred research strategy when dealing with 'how' or 'why' questions about current events when behaviour cannot be manipulated. Nel (2015) indicated that case study research allows the researcher to fully grasp the research topic by focusing on a few cases. Yin (2018) highlighted five components of a research design that are critical in case study research:

- The case study's questions;
- Its propositions, if any;
- Its case;
- The logic linking the data to the propositions, and
- The criteria for interpreting findings.

3.2.2 Mulitple-case study design

Yin (2018) noted that the multiple-case study design thoroughly analyses several cases, while a single case study is a detailed analysis of one case. Using multiple-case studies increases the generalizability of the findings, adding validity to the research that appears to take a positivist view. In the multiple-case study design, the researcher replicates the research process for each case separately (Yin, 2018).

While the researcher recognises that all emerging dairy farmers' experiences are unique, they share the same challenges in their farming enterprises. Multiple cases of emerging dairy farmers farming on various farms allowed for comparisons of their experiences under various conditions. In addition, the researcher would be able to conduct a cross-case analysis to synthesize the everyday experiences of selected emerging dairy farmers (Conner, 2014).

3.2.3 Research questions

The research questions were created to guarantee that the scope and direction of the study adhered to the study's goal and made efficient use of time and resources. As stated in Chapter 1, the study's research questions were:

1. What are the challenges influencing the commercialisation of emerging dairy farmers in the Free State Province?
2. What are the opportunities for the commercialisation of emerging dairy farmers in the Free State Province?
3. What strategies can be used to assist emerging dairy farmers to become commercial farmers?
4. How can dairy business hub models help to commercialise emerging dairy farmers in the Free State Province?

3.2.4 Research propositions

According to Rashid et al. (2019), theoretical propositions are formal statements about the phenomena under investigation based on the researcher's prior knowledge and experience in the field. Rashid et al. (2019) also noted that hypotheses, or in this case, study propositions, often exist in descriptive research. However, they may be more speculative than conclusive, and the real focus is on studying relationships between variables, though these relationships may be more active and effective than casual. In this light, the study propositions formulated by this study indeed have an exploratory nature.

Yin (2018) explains that each proposition draws attention to something that should be investigated within the scope of the study. They reflect critical theoretical issues and begin to tell the researcher where to look for relevant evidence. Four study propositions were formulated for this study. This formulation process involved a thorough examination of the literature from which key themes were drawn and, subsequently, an initial draft of study propositions. The following propositions have been formulated in Chapter 1 and will be addressed in the table below.

Table 3.1: Research propositions

Research Questions	Research Objectives	Research Propositions
What are the challenges influencing the commercialisation of emerging dairy farmers in the Free State Province?	To identify and describe the critical challenges influencing the commercialisation of emerging dairy farmers in the Free State.	Lack of government support, lack of knowledge and skills, imports of dairy products, milk price, access to markets, access to finances, and infrastructure are challenges facing emerging dairy farmers that need to be overcome.
What are the opportunities for the commercialisation of emerging dairy farmers in the Free State Province?	To investigate the opportunities for the commercialisation of emerging dairy farmers in the Free State Province.	Government support and adding value to milk will assist in commercialising emerging dairy farmers in the Free State Province.
What strategies can be used to assist emerging dairy farmers to become commercial farmers?	To recommend strategies that can be used to assist emerging dairy farmers in becoming commercial farmers.	Regulation of milk imports and milk price, state subsidies, access to land and effective extension services are critical in the commercialisation of emerging dairy farmers.
How can dairy business hub models help to commercialise emerging dairy farmers in the Free State Province?	To assess the utility of dairy business hub models in helping commercialise emerging dairy farmers in the Free State Province.	Dairy business hub models can lead to the commercialisation of emerging dairy farmers in the Free State Province.

3.3 DESCRIPTION OF THE CASE STUDY AREA

The research focused on 15 emerging dairy farmers in the Free State Province who show potential to commercialise their enterprises. The Free State Province is South Africa's central province. Figure 3.1 depicts a map of the Free State, with its five district municipalities: Xhariep, Lejweleputswa, Fezile Dabi, Thabo Mofutsanyane, and Mangaung metropole. With 3.2 million hectares of cultivated land, the Free State accounts for 10.6% of South Africa's total land area and is one of the country's most important food centres (Coughlan & Hattingh, 2020).

According to Coughlan and Hattingh (2020), the Free State receives substantial rainfall in summer. During winter, temperatures can reach -9.5°C. The western and southern regions of the Free State are semi-arid. The annual rainfall is more than 900 mm near the mountain's eastern edge and less than 350 mm at the southwest corner. Most central locations receive between 450 and 650 mm of rain.

Figure 3.1: Map of the different districts in the Free State (Source: Stats SA, 2016)

3.4 SELECTION OF PARTICIPANTS

A purposeful sampling technique was used as the tool for the selection of cases. Purposeful sampling is defined by Palinkas et al. (2015) as the deliberate selection of participants that will best suit the research questions and assist the researcher in thoroughly understanding the problem. A purposeful sample described by Palinkas et al. (2015), which is “based on the assumption that the researcher wishes to discover, understand and get insight, therefore has to select the sample to be learned from”, was applied. The investigator desired information-rich cases to analyze in-depth; therefore, purposeful sampling made sense. Gentles et al. (2015) referred to this as a unique sample selection.

This case study selected fifteen emerging dairy farmers from the Free State Province. The farmers were chosen not only for their geographical vicinity but also for their considerable numbers compared to other Provinces. The study's aim was to identify the factors affecting the commercialisation of emerging dairy farmers and evaluate different business models to address the identified factors and assist in achieving such commercialisation. This purpose served as a guide in determining the following participant selection criteria.

3.5 CASE STUDY DESCRIPTIONS

3.5.1 Case A

Case A is a dairy farm situated in Wepener. The farm is leased for 30 years under the PLAS (Proactive Land Acquisition Strategy) with an option to purchase. The size of the farm is 648 ha. The herd consists of 80 Jerseys and Holstein cattle. Fifty-four cows are milked in a 12-point Herringbone milking parlour, and the farm produces 300 litres of milk per day. Milk is sold to Dairy Corporation.

3.5.2 Case B

Case B dairy farm is located in Marseilles, next to Ladybrand. The size of the farm is 723. The herd consists of 20 Holstein cows, eight of which are lactating and are milked in an 8-point Herringbone milking parlour. Each cow produces an average of 30 litres

of milk per day. There is no formal market for the milk; it is sold to the local community. This herd was named Emerging Master Dairymen of the Year by the Agricultural Research Council (ARC) in 2015.

3.5.3 Case C

Case C is a dairy farm located in Dewetsdorp. The size of the farm is 992 ha, with a total herd of 60 Jersey and Holstein cows. Thirty-one cows are milked daily in a Tandem milking parlour, producing an average of 450 litres. The milk is pasteurised and sold to the local community.

3.5.4 Case D

Case D dairy farm is located in Mantsopa, near Tweespruit. The size of the farm is 239 ha. The herd consists of 75 Holstein and Jersey cows; 50 are milked in a 4-point Herringbone milking parlour and produce an average of 700 litres of milk daily. Denmar is supplied with milk. ARC awarded this herd as Emerging Master Dairyman of the year award in 2017.

3.5.5 Case E

Case E is a dairy farm in Mantsopa, near Tweespruit. The size of the farm is 360 ha. The herd consists of 80 Holstein and Jersey cows, 20 of which are lactating. The cows produce an average of 180 litres of milk per day and are milked in a 4-point Herringbone milking parlour. Milk is sold to Denmar.

3.5.6 Case F

Case F is a dairy farm located in Senekal. The size of the farm is 453 ha. The herd consists of 44 Holstein and Jersey cows, and 30 are in milk. The cows are milked in a 4-point Herringbone milking parlour, and the herd produce an average of 320 litres of milk per day. Bandini Cheese is supplied with milk. In 2016, ARC the herd received the Emerging Master Dairyman of the year award.

3.5.7 Case G

Case G is a dairy farm located in Senekal. The size of the farm is 2100 ha. The herd comprises of 95 Ayrshire cows that are milked in an 8-point Herringbone milking parlour and produce an average of 1250 litres of milk per day. Nkunzi Milkyway used to be supplied with milk, but due to low milk prices, milking was stopped on 01 January 2015.

3.5.8 Case H

Case H is a dairy leased farm situated in Harrismith. The size of the farm is 532 ha. The herd consists of 30 Holstein and Jersey cows on the farm. Twenty-four cows were hand-milked, producing an average of 200 litres of milk daily. Nestle used to be supplied with milk, which stopped after the farm owner terminated the lease contract.

3.5.9 Case I

Case I is a dairy farm situated in Harrismith. The size of the farm is 136 ha. The herd comprises 45 Holstein and Jersey cows on the farm. Twenty-four cows are milked on a 4-Point Tandem parlour, producing an average of 220 litres of milk per day. Nestle is supplied with milk.

3.5.10 Case J

Case J is a dairy farm located in Harrismith. The size of the farm is 223 ha. The herd consists of 82 Shorthorn cattle and milked 23 cows in a 4-point Tandem milking parlour, producing an average of 450 litres of milk daily. In 2007, ARC awarded the herd Emerging Master Dairyman of the Year. Nestle used to be supplied with milk but stopped milking on 01 February 2021 because the milk price was too low.

3.5.11 Case K

Case K is a dairy farm situated in Qwa-Qwa. The size of the farm is 620 ha. The herd consists of 82 Holstein and Jersey cows, 32 of which are in milk and produce an

average of 250 litres of milk per day in a 4-point Herringbone milking parlour. Nestle is supplied with milk.

3.5.12 Case L

Case L is a dairy farm situated in Qwa-Qwa. The size of the farm is 365 ha. The herd consists of 200 Holstein, Ayrshire, and Jersey cows, 58 of which are in milk and produce an average of 750 litres of milk per day in a 4-point Herringbone milking parlour. Nestle is supplied with milk.

3.5.13 Case M

Case M is a dairy farm situated in Harrismith. The size of the farm is 162 ha. The herd consists of 220 Holstein, Ayrshire, and Jersey cows, milking 89 in a 4-point Herringbone milking parlour, producing an average of 2500 litres of milk per day. In 2008, 2009, 2018, 2019, 2020, and 2021, ARC awarded this herd Emerging Master Dairymen of the Year. Nestle is supplied with milk.

3.5.14 Case N

Case N is a dairy farm located in Harrismith. The size of the farm is 463 ha. The herd consists of 51 Holstein, Ayshire, and Jersey cows, 36 of which are in milk and produce an average of 400 litres of milk per day in a 4-point Herringbone milking parlour. Nestle is supplied with milk.

3.5.15 Case O

Case O is a dairy farm located in Qwa-Qwa. The size of the farm is 350 ha. The herd comprises 71 Holstein and Jersey cows and 17 lactating cows, producing an average of 118 litres of milk per day in a 4-point Tandem milking parlour. Nestle is supplied with milk.

3.6 DATA COLLECTION METHODS

Yin (2018) outlines three guiding principles that the researcher should follow when gathering data for a case study:

1. Different evidence sources should be employed to target a broad range of problems with history and behaviour. Data triangulation promotes validity since it supports a researcher's conclusions from more than one source of information.
2. A well-structured and presentable case study database should be created to improve the study's accuracy.
3. An evidence chain should be maintained, which will strengthen the reliability of the results.

As is customary in case study research, the researcher will be the primary data gathering instrument. This study collected data using semi-structured and focus group interviews.

3.6.1 Semi-structured interviews

Data were gathered from 15 emerging dairy farmers in the Free State Province using semi-structured interviews. Detailed interviews are one of the most successful ways of capturing a person's perception or perspective in qualitative and quantitative research (Sileyew, 2019). Semi-structured interviews offer the advantage of enabling the researcher to explore interviewees' attitudes, understanding and opinions, which gives room for the perceptions to expand and articulate their answers in detail (Adhabi & Anozie, 2017).

In this study, semi-structured interviews provided a practical way to identify factors influencing emerging dairy farmers' commercialisation and evaluate different business models to address the identified factors and help achieve such commercialisation.

3.6.2 Focus group interviews

Focus groups are primarily data collecting strategies that acquire data through semi-structured group interviews. Dilshad and Latif (2013) recommend the focus group membership range from six to twelve subjects. Typically, these groups are overseen

by a group leader. The methods used to collect data in focus groups may differ in their design (Creswell & Creswell, 2017). A focus group is a controlled, in-depth discussion in which a limited number of respondents address many concerns on a topic about which they are well versed. Because of the variety of issues, the connection between the subject of the inquiry and the target demographic, the necessity for in-depth information, and the clarity of the goal, focus group talks are suited for the current scenario (Lopez & Whitehead, 2013).

After a series of semi-structured interviews with emerging dairy farmers, a focus group was formed to examine the general nature of comments from different individuals (Hayden et al., 2021). Dairy specialists from the Agricultural Research Council (ARC) and SA Studbook formed part of this focus group.

3.7 DATA ANALYSIS

Data analysis is the process of making sense of data. Data analysis's practical purpose or outcome is to answer the research questions provided at the outset of the investigation. The study findings should provide answers to the stated questions (Flick, 2017). This case study's data were analysed using qualitative and quantitative methods. Semi-structured and focus group interviews were documented and transcribed. Data were captured in excel and analysed using the Statistical Package for the Social Science (SPSS) version 27. Quantitative data were analysed using frequency tables and descriptive statistics. Qualitative data were coded and analysed according to themes.

3.8 ETHICAL CONSIDERATIONS

Ethical measures are principles to which the researcher will be bound when conducting a study before data collection (Roller & Lavrakas 2015). Ethical considerations were followed throughout the study; approval was sought from the University of the Free State before data collection. Emerging dairy farmers were assured of the high level of confidentiality of the information provided for the study.

3.9 SUMMARY

This chapter described and explained the researcher's research methodology in this case study. A multiple case study was used, with 15 cases selected. In addition, case studies were described in detail. Data were gathered through semi-structured and focus group interviews considering the ethical concerns. The case study results and findings are presented in the following chapter.

CHAPTER 4 :
CASE STUDY RESULTS AND FINDINGS

4.1 INTRODUCTION

The case study results are presented in this chapter based on the four research questions specified in chapter one. This chapter analysed and interpreted the data acquired through semi-structured and focus group interviews. This chapter gathered data from 15 emerging dairy farmers in the Free State Province and dairy specialists from the Agricultural Research Council and SA Stud Book.

4.2 SEMI-STRUCTURED INTERVIEWS

4.2.1 Biographical characteristics

In this section, the biographical characteristics of the sample group and their herds' attributes are discussed, including the participants gender, marital status, age, education, source of income, farm ownership, farm size, participants' production status, cattle breed(s), herd size, daily milk production, milking cows, dry cows, heifers and type of milking parlour.

4.2.1.1 Participants gender

In the questionnaire, participants were required to indicate their gender. This question was designed to identify the most common gender in emerging dairy farming. The majority of participants (67%) were men, as shown in Figure 4.1 below.

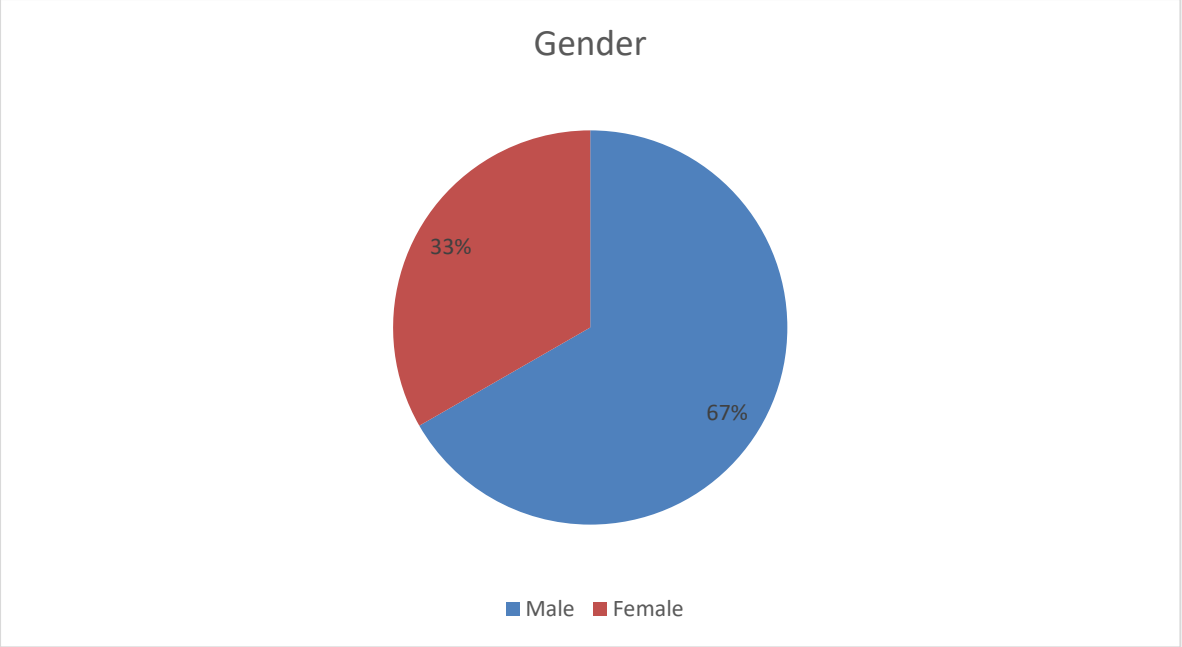

Figure 4.1: Participants gender

4.2.1.2 Participants marital status

In the study, participants were asked to state their marital status. Figure 4.2 below indicates that most participants were either single or married (40% respectively), and 20% were divorced.

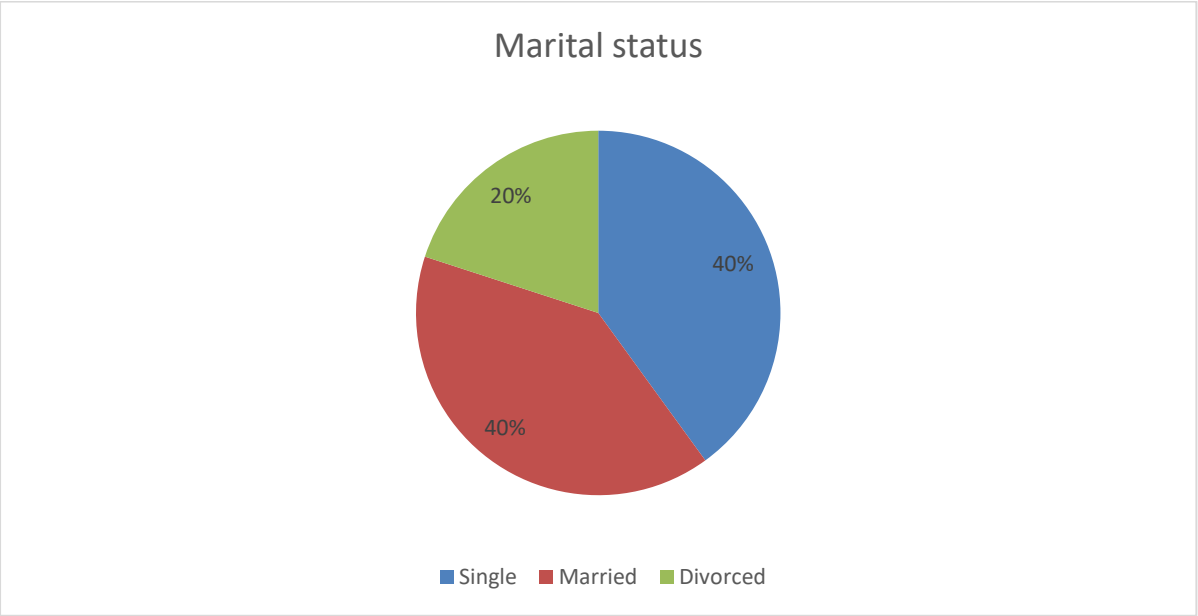

Figure 4.2: Participant marital status

4.2.1.3 Participants age

Table 4.1 presents summary statistics for the age of the emerging dairy farmers who participated in the study. The mean age of participants was 52,33 ± 15,52, with a minimum of 26 years and a maximum of 72 years.

Table 4.1: Participants age

Number	**15**
Mean	52,33
Median	54,00
Std. Deviation	15,523
Range	46
Minimum	26
Maximum	72

4.2.1.4 Participants level of education

The level of education is an important factor that can influence the commercialisation of emerging dairy farmers. As a result, the study sought to ascertain the participants level of education. The results are shown in Figure 4.3 below. The majority of participants (60%) had tertiary education.

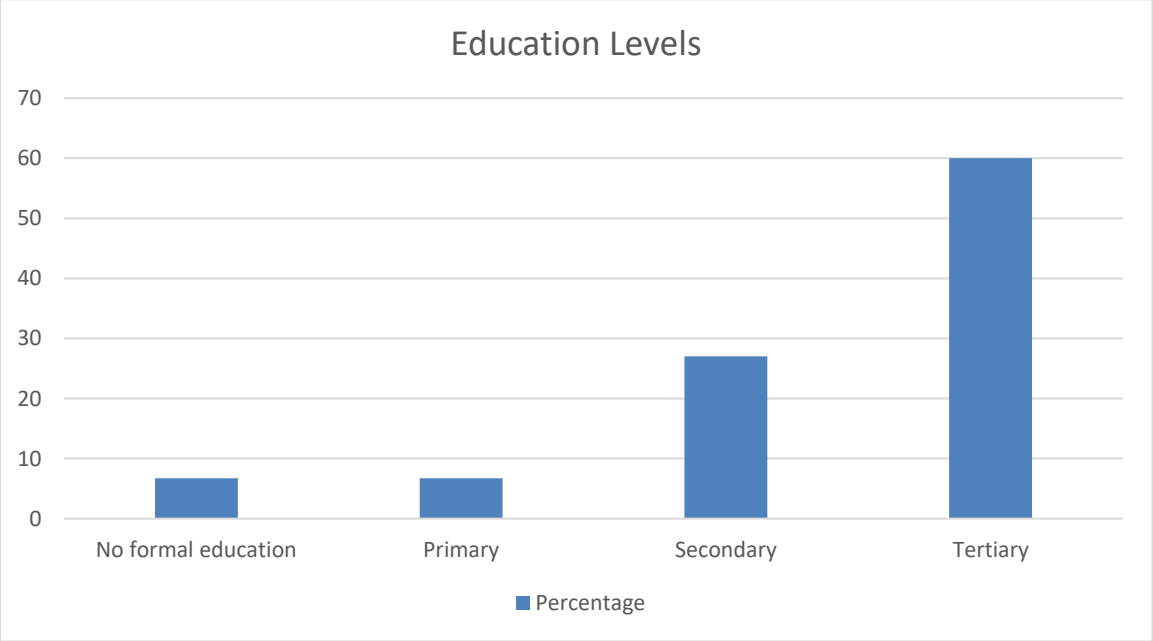

Figure 4.3: Participants level of education

4.2.1.5 Source of income

The participants were also asked to provide information about their source of income. According to Figure 4.4 below, dairy farming is the primary source of income for 93% of the participants.

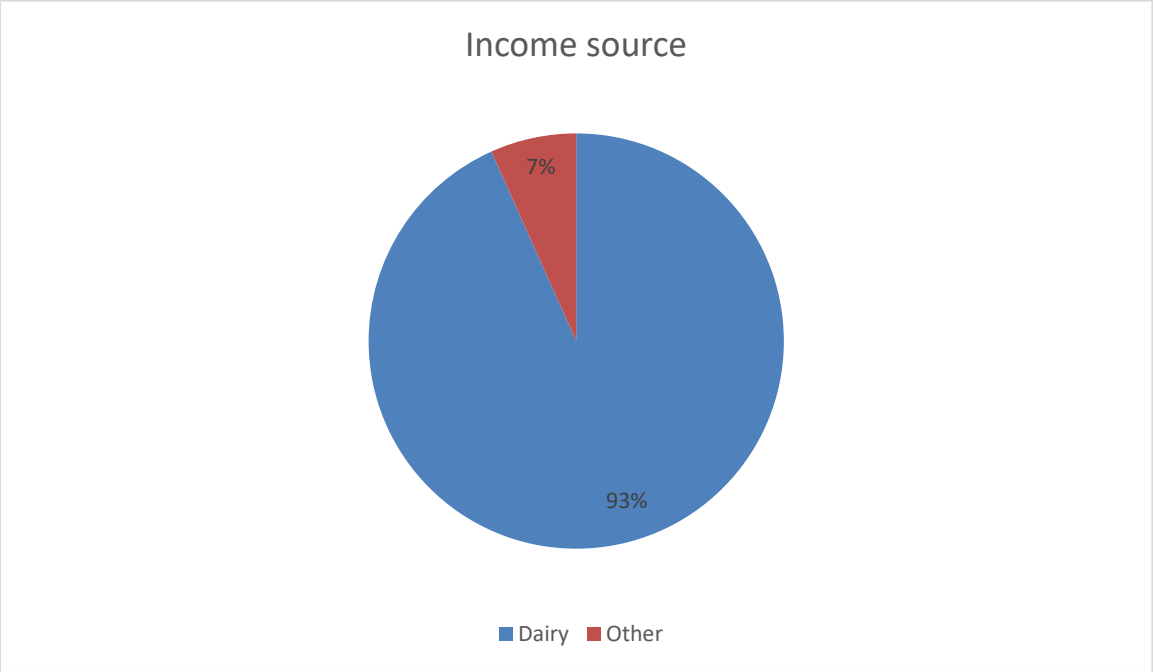

Figure 4.4: Source of income

4.2.1.6 Farm ownership

Figure 4.5 below indicates that 73% of participants own their farms. Only one participant reported that the farm is owned by the Department of Rural Development and Land Reform (DRDLR) under the Proactive Land Acquisition Strategy (PLAS) system, with a 30-year lease and an option to purchase the farm after the lease ends.

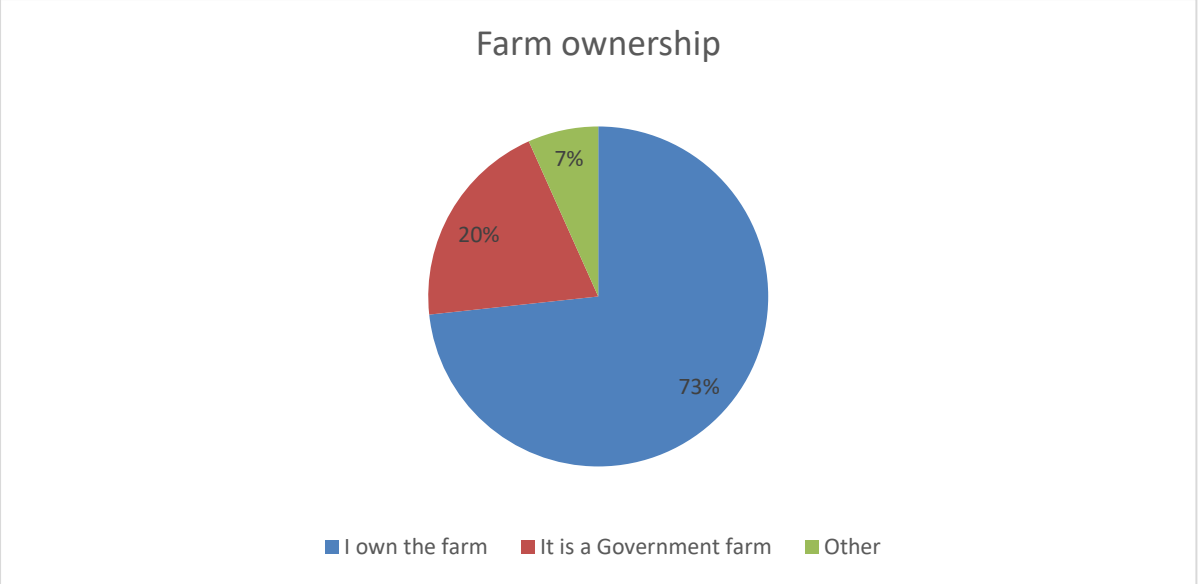

Figure 4.5: Farm Ownership

4.2.1.7 Participants farm size

Table 4.2 below indicates the average farm size was 537,73 ± 474,47 ha, with a minimum of 132 ha and a maximum of 2100 ha.

Table 4.2: Participants farm size

Number	**15**
Mean	537,73
Median	453,00
Std. Deviation	474,466
Range	1968
Minimum	132
Maximum	2100

4.2.1.8 Participants who are still milking

The study sought to establish the emerging dairy farmers who were active producers and those who had stopped dairy farming. Figure 4.6 below reflects that 80% of the participants are still milking.

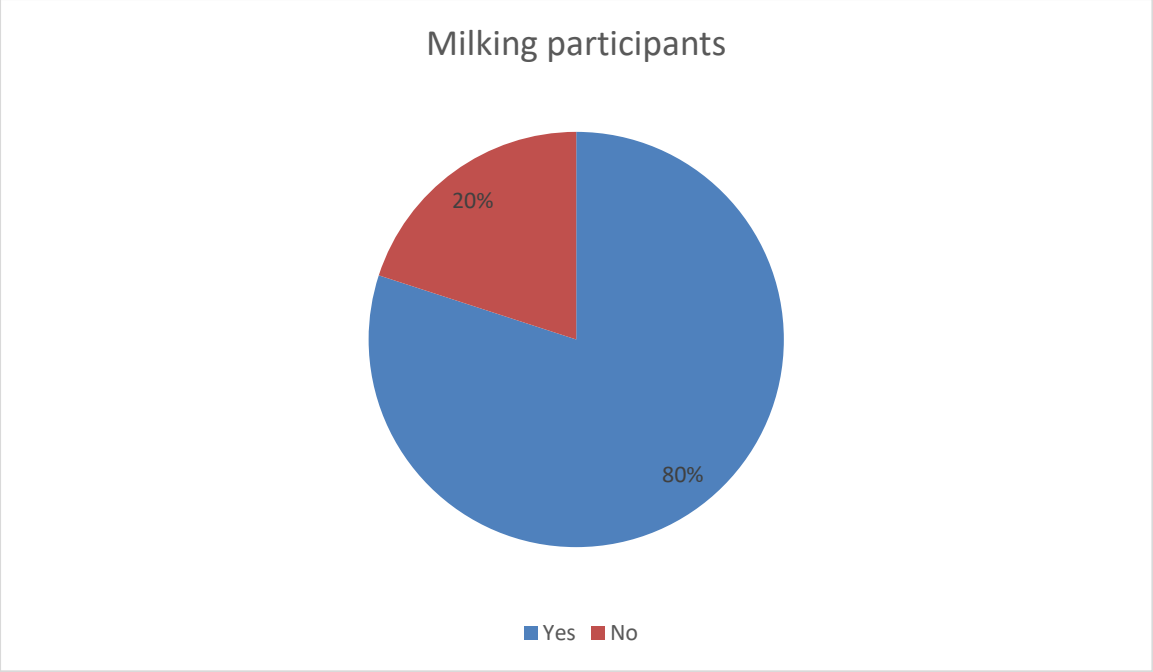

Figure 4.6: Participants who are still milking

4.2.1.9 Participants who stopped milking

The study also sought to establish emerging dairy farmers who stopped milking. Figure 4.7 below shows three participants who stopped milking in 2014, 2015, and 2021, respectively. The most common reason participants stopped milking was low/poor income from the sale of milk.

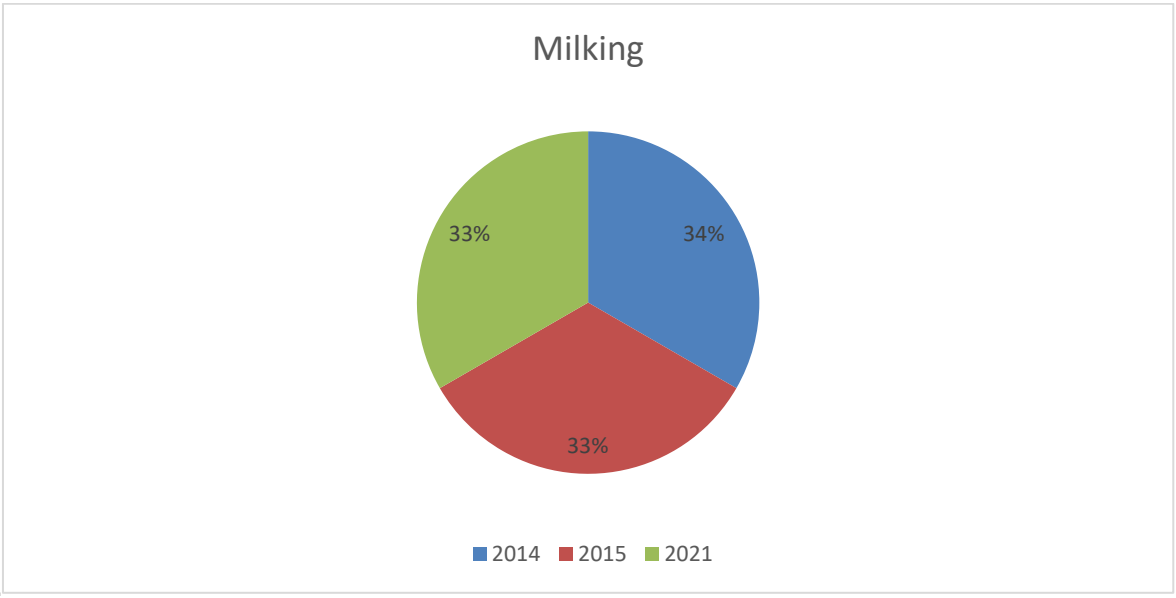

Figure 4.7: Participants who stopped milking

4.2.1.10 Cattle breeds used by participants

To gain an insight into the herd characteristics, the study gathered data to establish the breeds that the participants were using. Figure 4.8 below shows that most participants have Holstein and Jersey cattle (60%); other breeds included Ayrshire and Shorthorn cattle.

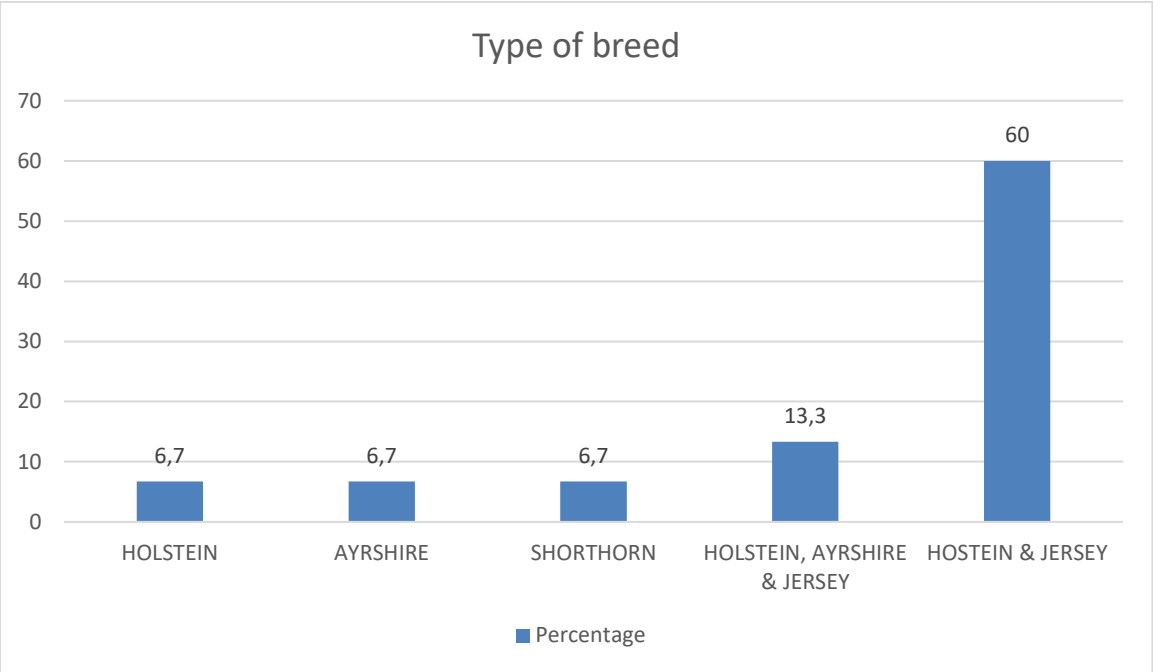

Figure 4.8: Cattle breeds used by participants

4.2.1.11 Participants herd size

According to Table 4.3 below, the mean size of the participants' herds was 87,80 ± 61,58, with the smallest herd being 20 and the largest 220 cows.

Table 4.3: Participants herd size

Number	**15**
Mean	87,80
Median	75,00
Std. Deviation	61,578
Range	200
Minimum	20
Maximum	220

4.2.1.12 Daily herd milk production

Table 4.4 below shows that the average daily milk production for the participants' herds was 541,2 ± 622,61 litres, with the lowest production being 30 litres and the highest 2 500 litres.

Table 4.4: Daily herd milk produced

Number	**15**
Mean	541,20
Median	320,00
Std. Deviation	622,613
Range	2470
Minimum	30
Maximum	2500

4.2.1.13 Number of milking cows

Table 4.5 below reveals that the mean number of cows in milk per participant's herd was 39,40 ± 25,43, with the smallest being eight and the biggest 95 cows.

Table 4.5: Number of milking cows

Number	**15**
Mean	39,40
Median	31,00
Std. Deviation	25,433
Range	87
Minimum	8
Maximum	95

4.2.1.14 Number of dry cows per herd

Table 4.6 below shows that the mean number of dry cows per participant's herd was 27,53 ± 16,89, with a minimum of 6 and a maximum of 60.

Table 4.6: Number of dry cows per herd

Number	**15**
Mean	27,53
Median	25,00
Std. Deviation	16,890
Range	54
Minimum	6
Maximum	60

4.2.1.15 Number of heifers per participants 'herd

The mean number of heifers per participant's herd was 16,33 ± 15,86, with a minimum of 2 and a maximum of 65, as shown in Table 4.7.

Table 4.7: Participants heifers

Number	**15**
Mean	16,33
Median	10,00
Std. Deviation	15,864
Range	63
Minimum	2
Maximum	65

4.2.1.16 Type of milking parlour

According to Figure 4.9 below, 10 participants used a herringbone milking parlour, four used a tandem milking parlour, and one used a milking shed.

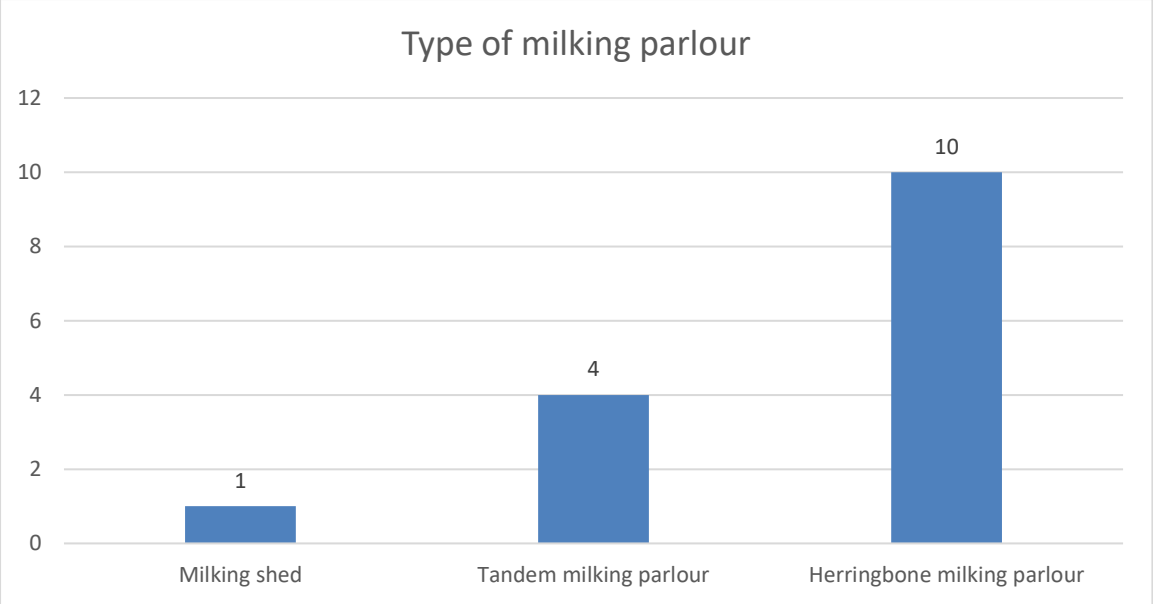

Figure 4.9: Type of milking parlour

4.2.2 Access to financial support

Figure 4.10 below reflects that 87% of the case study participants received financial aid. One participant stated that financial institutions turned down his application because he did not have a title deed for the farm. He inherited the farm from his late grandfather, but ownership was not transferred. Another participant had his finance application declined by a commercial bank due to his advanced age.

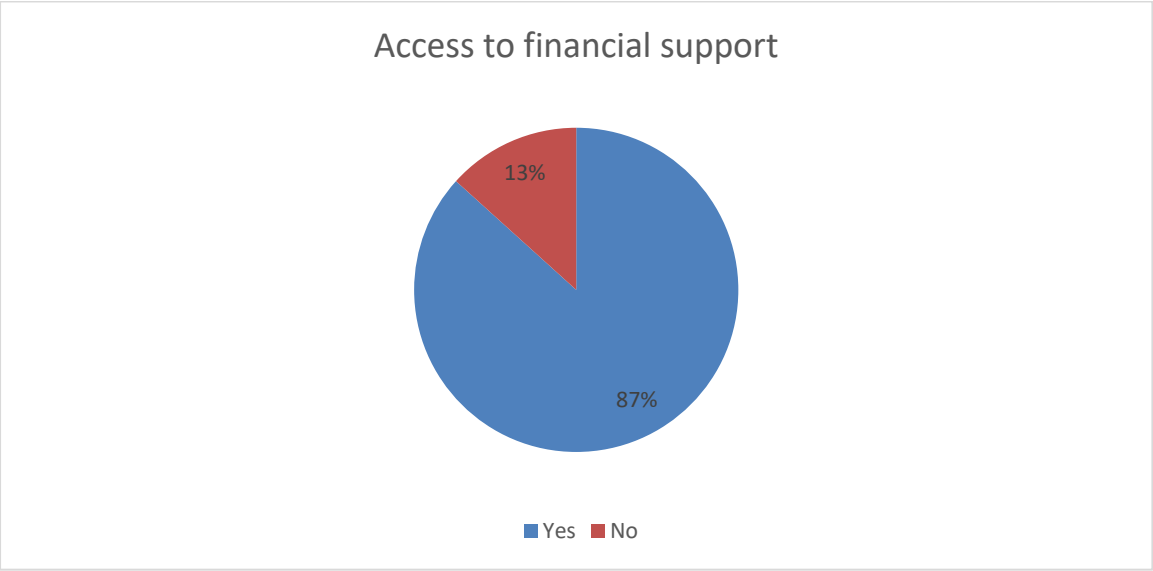

Figure 4.10: Access to financial support

According to Figure 4.11 below, most case study participants received financial assistance from the Department of Agriculture in the form of infrastructure, livestock, and planted fields.

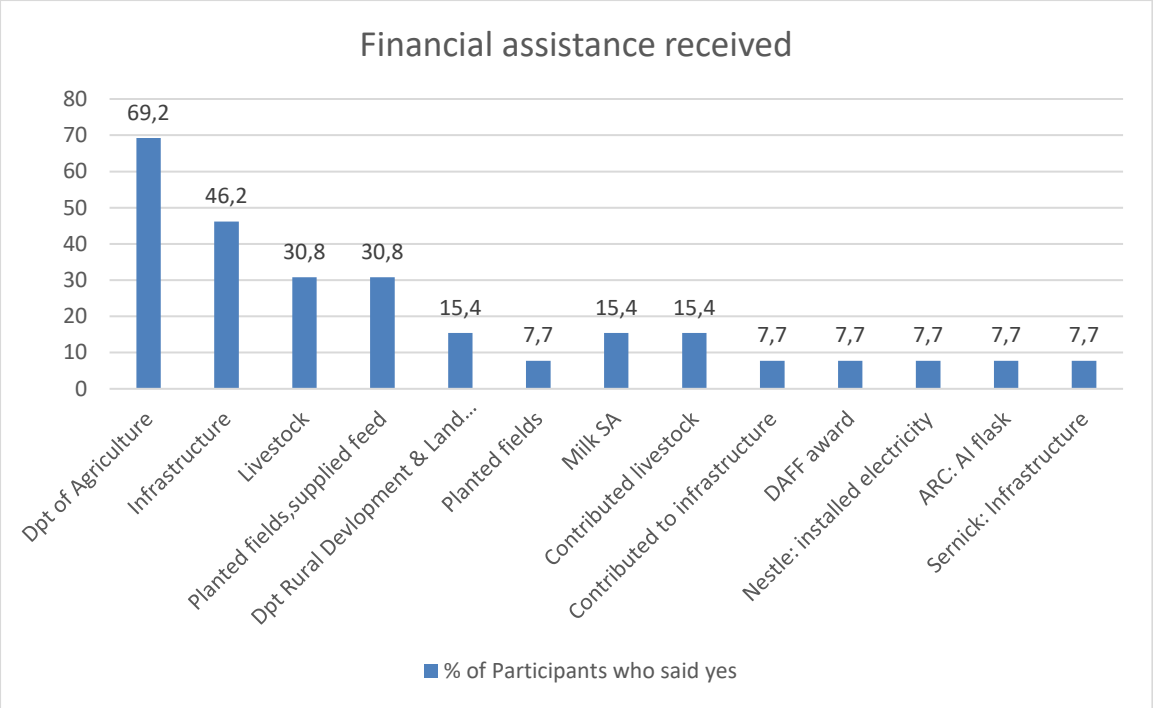

Figure 4.11: Sources of financial support

4.2.2.1 Advice on how to access financial support

Figure 4.12 below indicates that most case study participants (46.2%) sought advice on obtaining financial assistance from Agricultural Advisors/Extension Officers. Some of the participants expressed concern that there is too much politics surrounding the issue of grants, with requests being turned down at times, and Agricultural Advisors were not helpful in that regard.

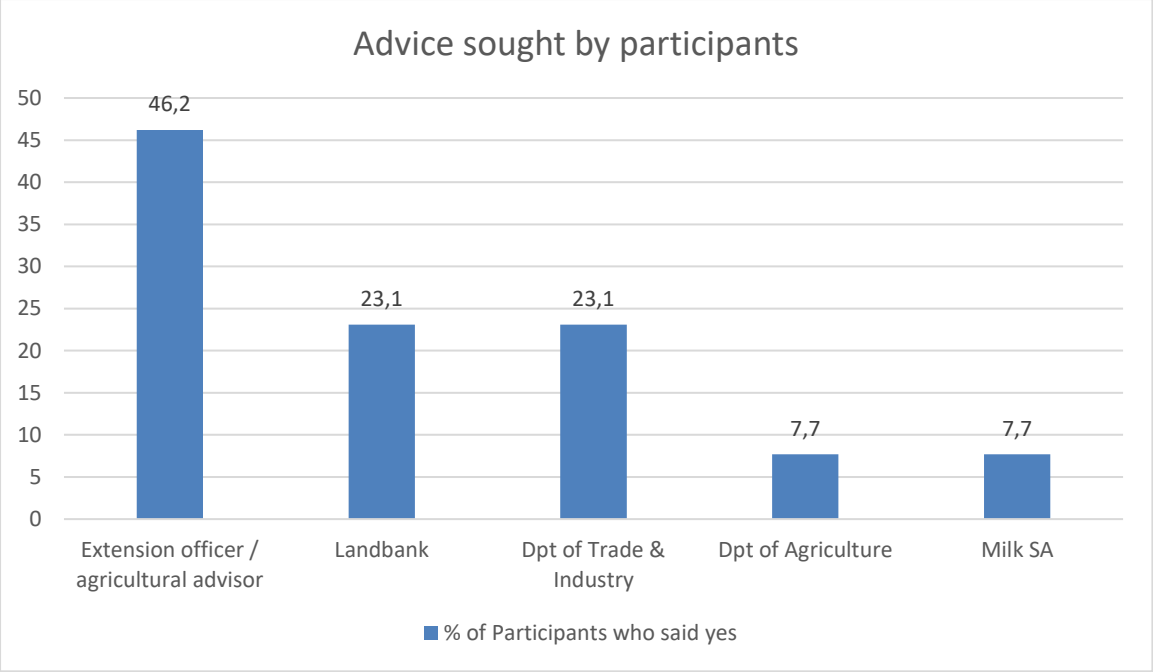

Figure 4.12: Advice on how to access financial support

4.2.3 Access to markets

Figure 4.13 below shows that most participants sold their milk to Nestle (53,8%). Two participants who did not have market access stated that the milk buyer stopped collecting their milk because they produced less milk and the distance to their farms was too far.

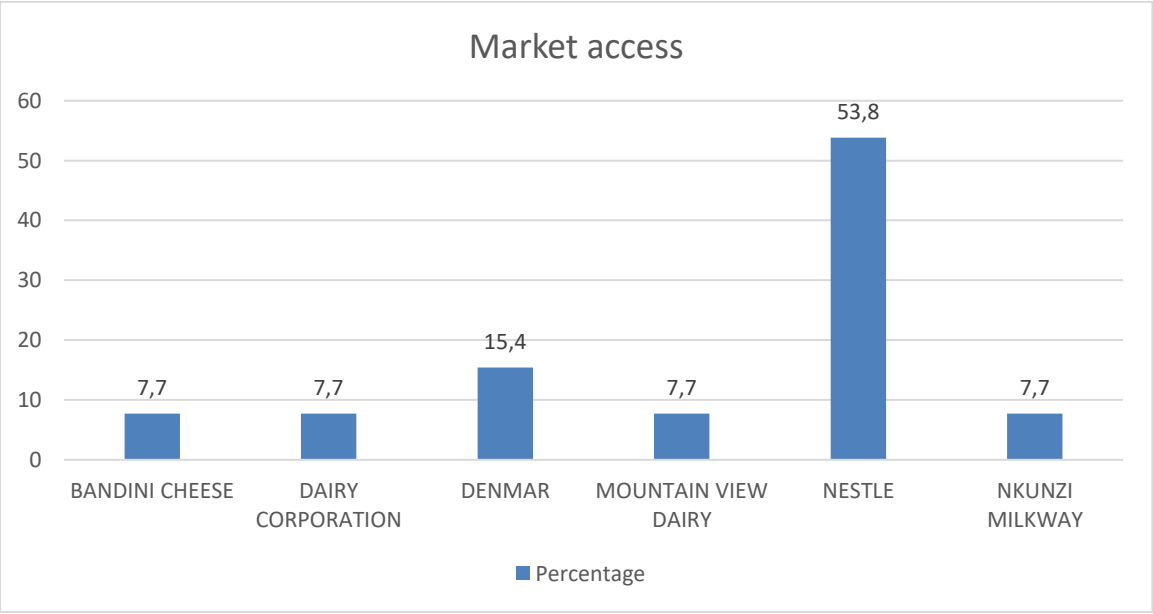

Figure 4.13: Access to markets

4.2.3.1 Ways to overcome the challenges that influence access to markets

As shown in Figure 4.14 below, most case study participants believe that increasing milk production and producing high-quality milk can help overcome market access challenges.

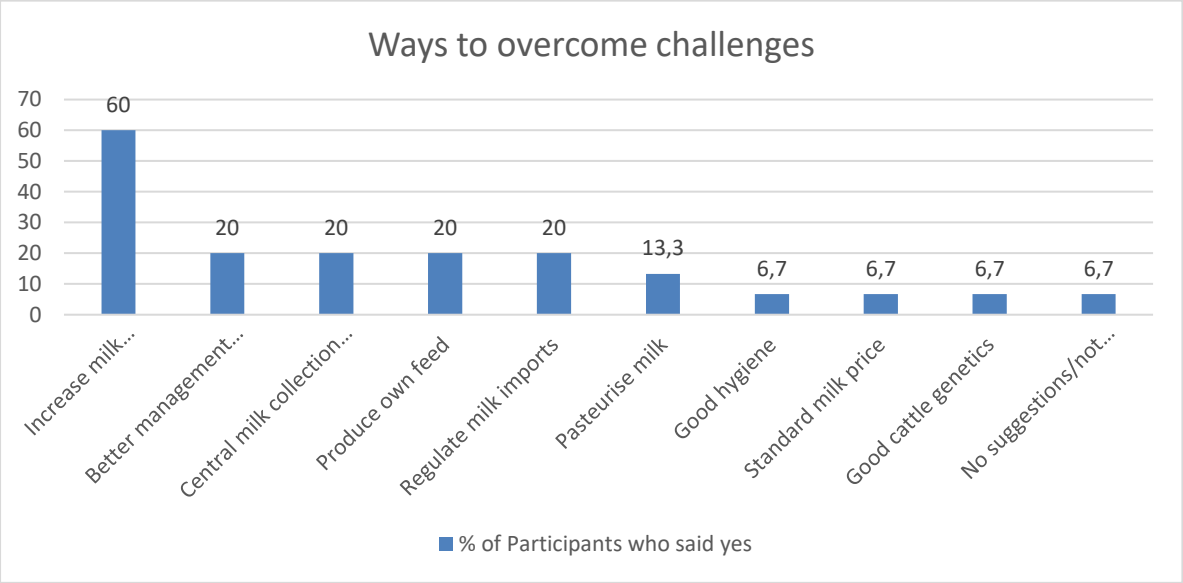

Figure 4.14: Ways to overcome the challenges that influence access to markets

4.2.4 Infrastructure

As shown in Figure 4.15 below, 93% of the case study participants faced infrastructure challenges in their dairy business.

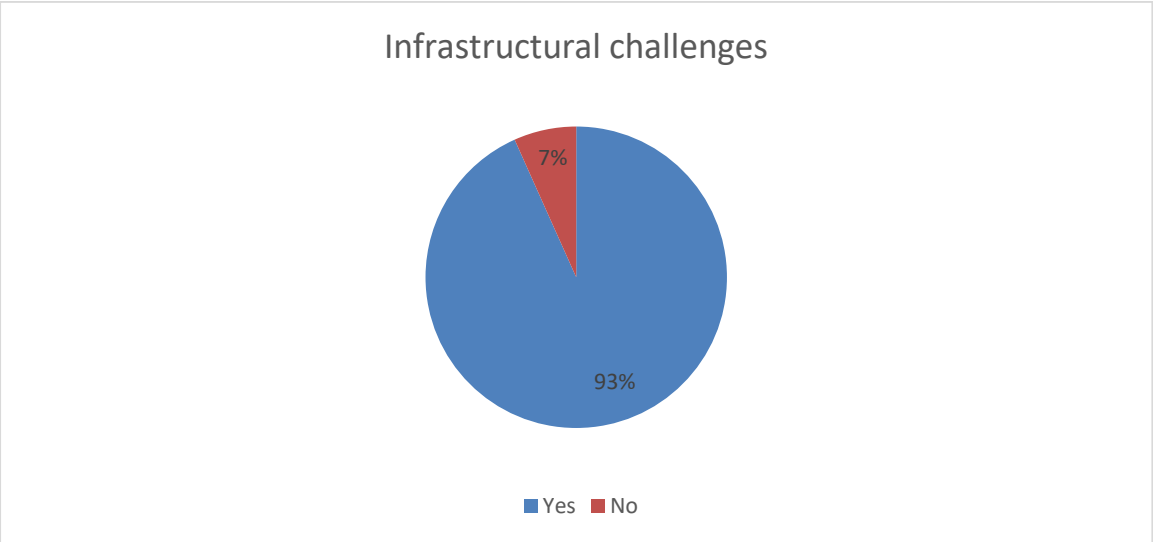

Figure 4.15: Infrastructural challenges

Most of the case study participants needed to upgrade their milking parlours, followed respectively by buying farm implements, building-storage facilities and buying additional dairy cows, as shown in Figure 4.16 below.

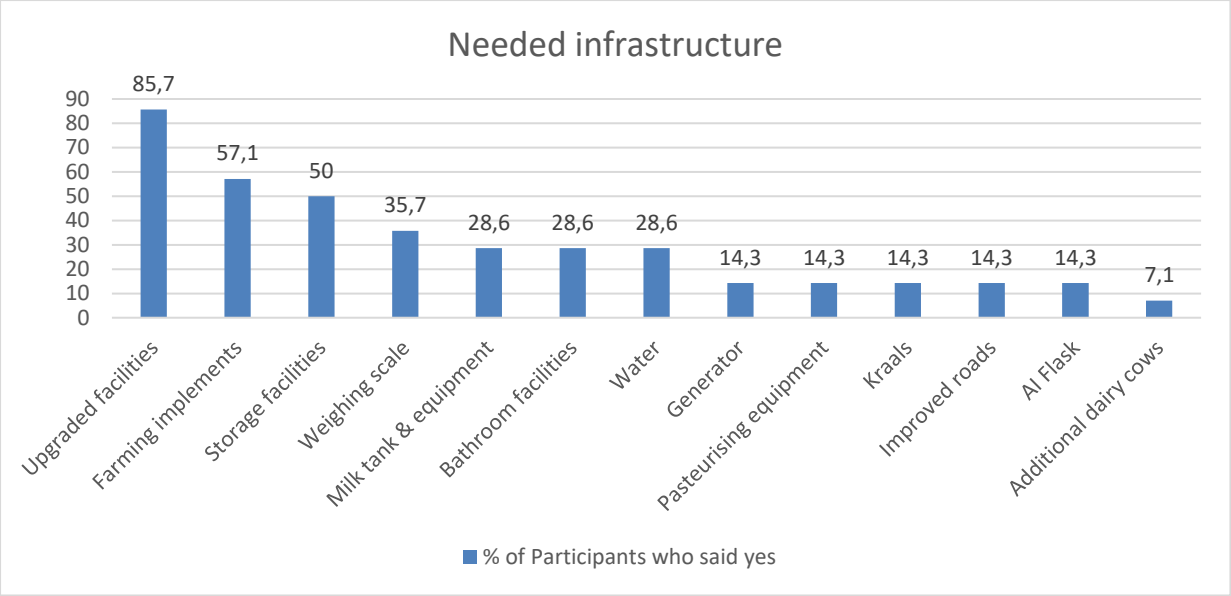

Figure 4.16: Infrastructure needed by emerging dairy farmers

4.2.5 Milk price

As indicated in Table 4.8 below, the case study participants were paid a mean price of R4,93 ± R0,62/ ℓ of milk, with the lowest price being R3,75/ℓ and the highest R6,50/ℓ.

Table 4.8: Price per litre

Number	**15**
Mean	4,9333
Median	4,8300
Std. Deviation	0,62411
Range	2,75
Minimum	3,75
Maximum	6,50

Most case study participants (87%) were dissatisfied with the price they received, as shown in Figure 4.17 below.

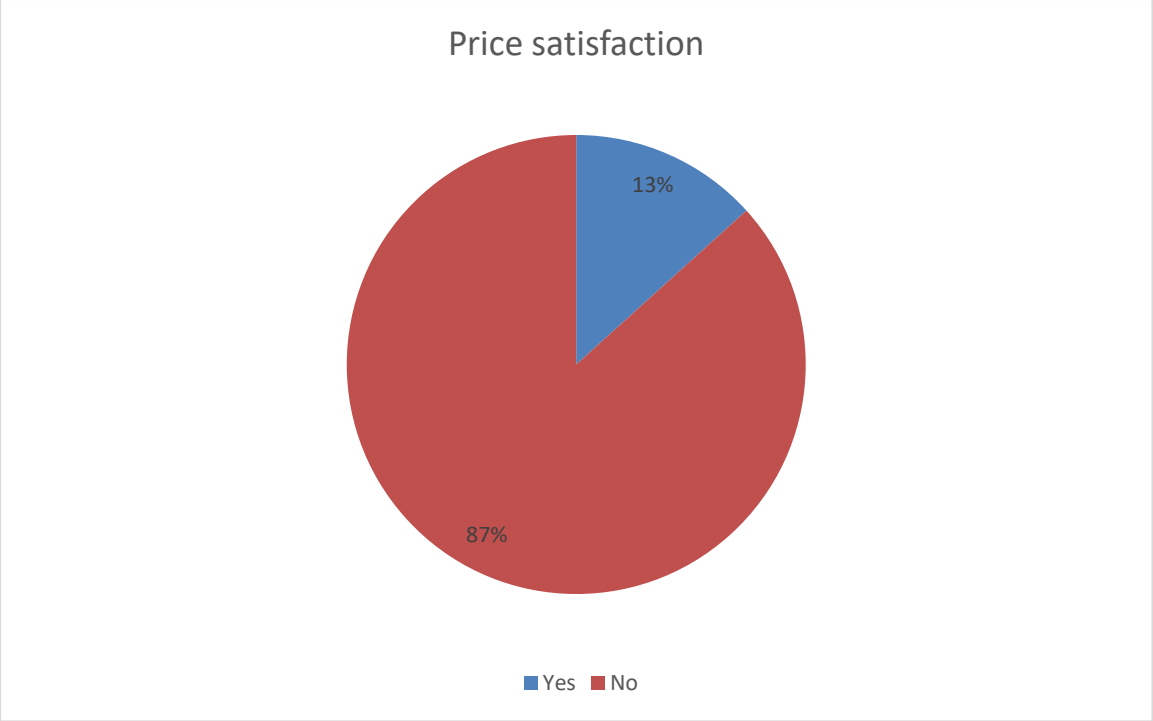

Figure 4.17: Satisfaction of participants with the price of milk

Participants in the case study mentioned high input costs, particularly high prices for fuel, power, labour, and feed, as the primary reason they were dissatisfied with the milk price, as shown in Figure 4.18 below.

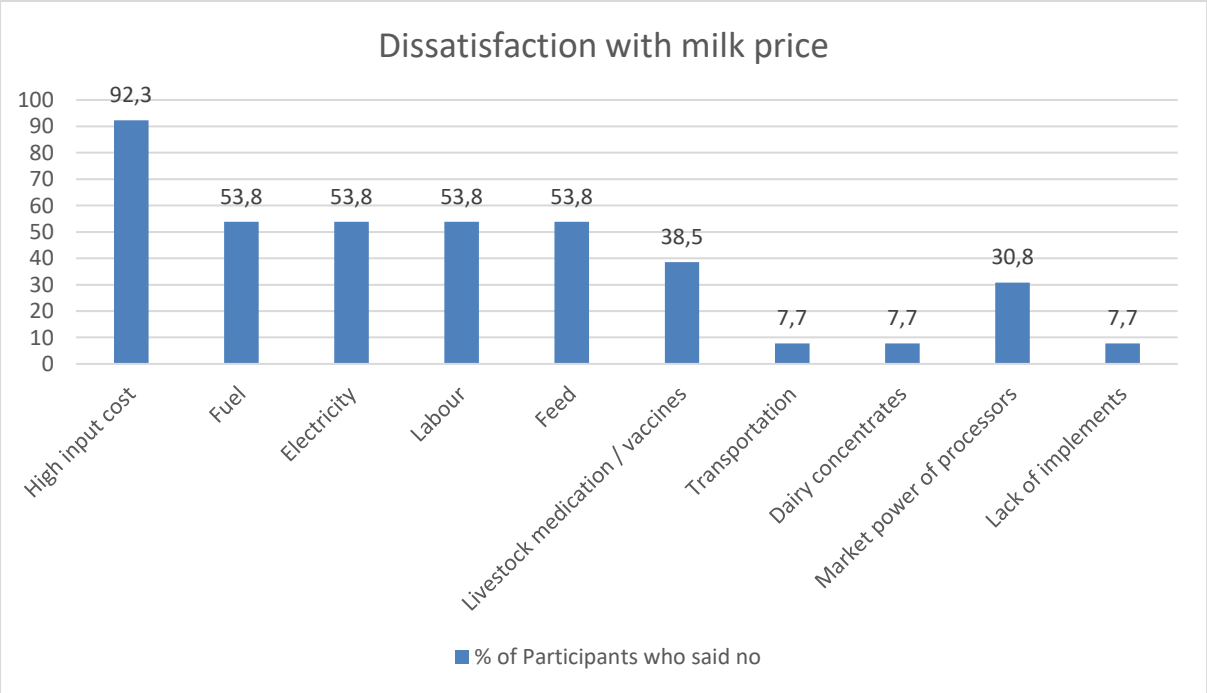

Figure 4.18: Reasons farmers were not satisfied with the price of milk

4.2.5.1 Ways to overcome the challenges that influence the low price of milk

As shown in Figure 4.19 below, most case study participants suggested that the government should provide or subsidise inputs to overcome the low profitability caused by low milk prices. This will enable the farmers to produce more milk, as well as improve the quality of the milk. They went on to say that milk imports should be prohibited and that the government should regulate milk prices.

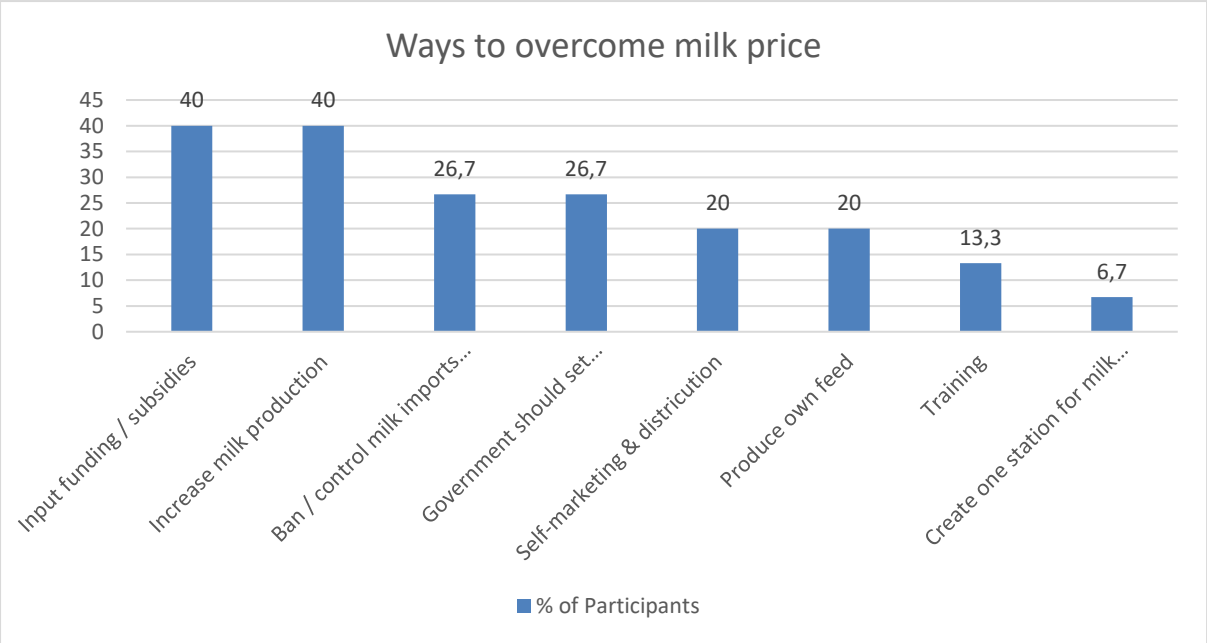

Figure 4.19: Ways to overcome the challenges that influence the low price of milk

4.2.6 Dairy management skills

All case study participants believed that they had dairy management skills. Figure 4.20 below shows that 66.7% had good farm planning skills. This was the skill with the highest rating. The case study participants' lowest rated skills were animal breeding and selection and marketing management.

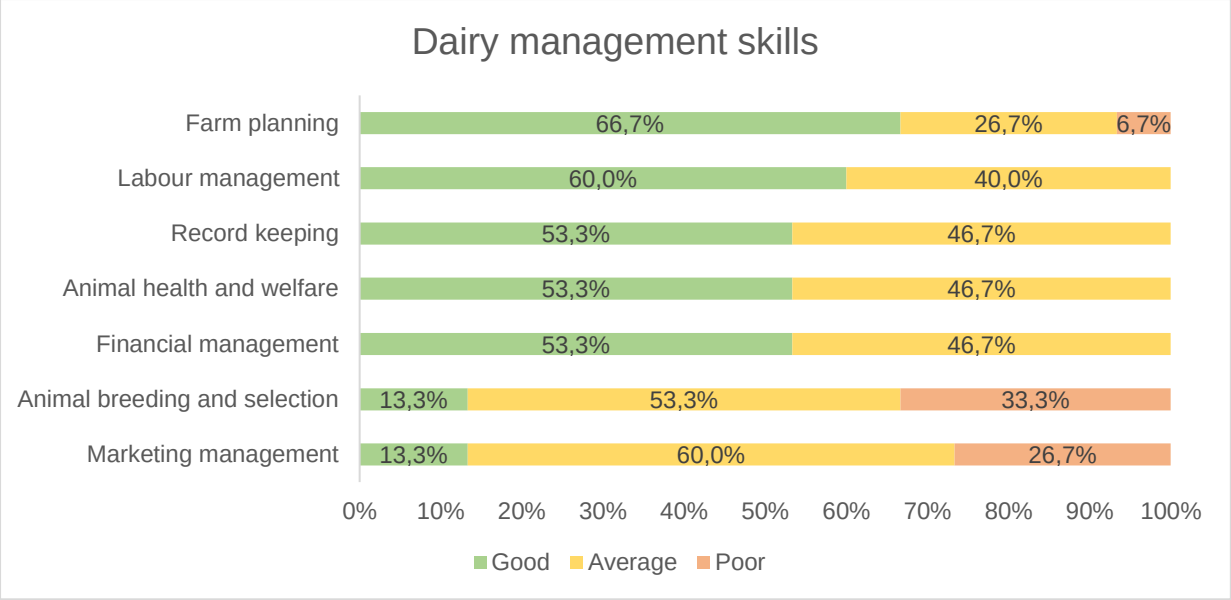

Figure 4.20: Dairy management skills

All case study participants said they had received training in dairy management. As shown in Figure 4.21 below, most felt the training was helpful. They had gained skills such as livestock feeding, administering medicines and vaccinations, artificial insemination and breeding.

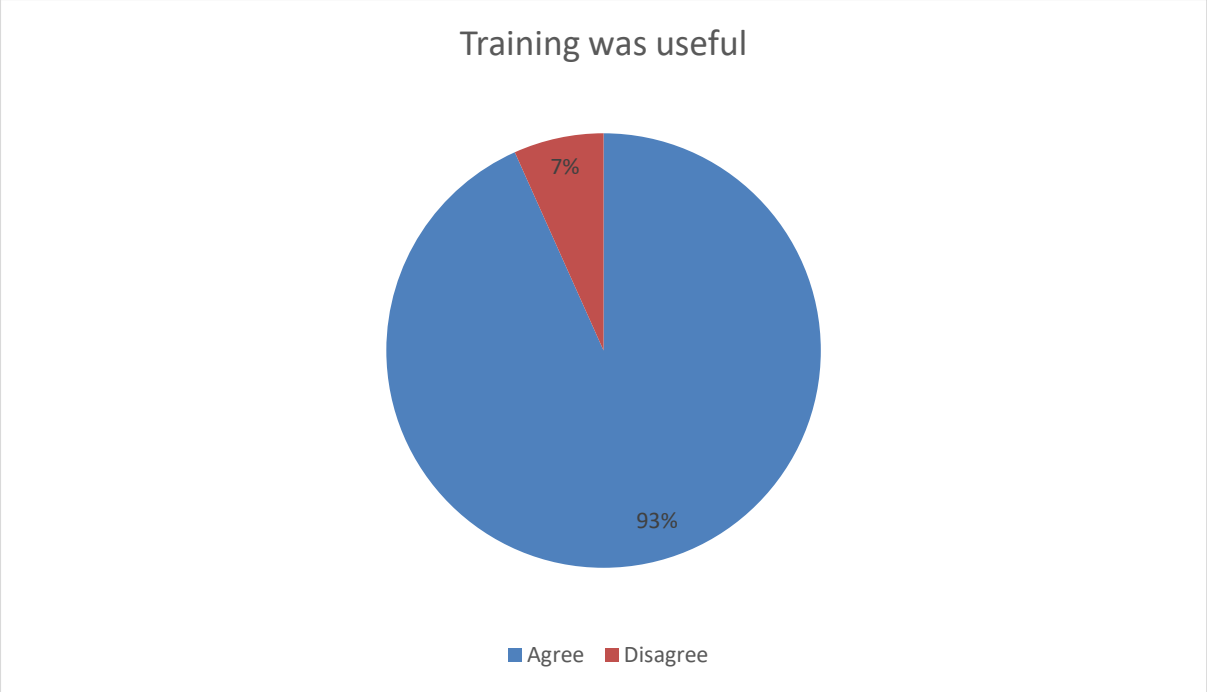

Figure 4.21: Training was useful (Source: Data collected)

4.2.6.1 *Additional training to assist emerging dairy farmers in becoming commercially viable*

Most case study participants felt that training in artificial insemination would assist in commercialising them, as shown in Figure 4.22 below. Breeding and selection, feed management and access to technology were the other training needs that were highly rated as critical.

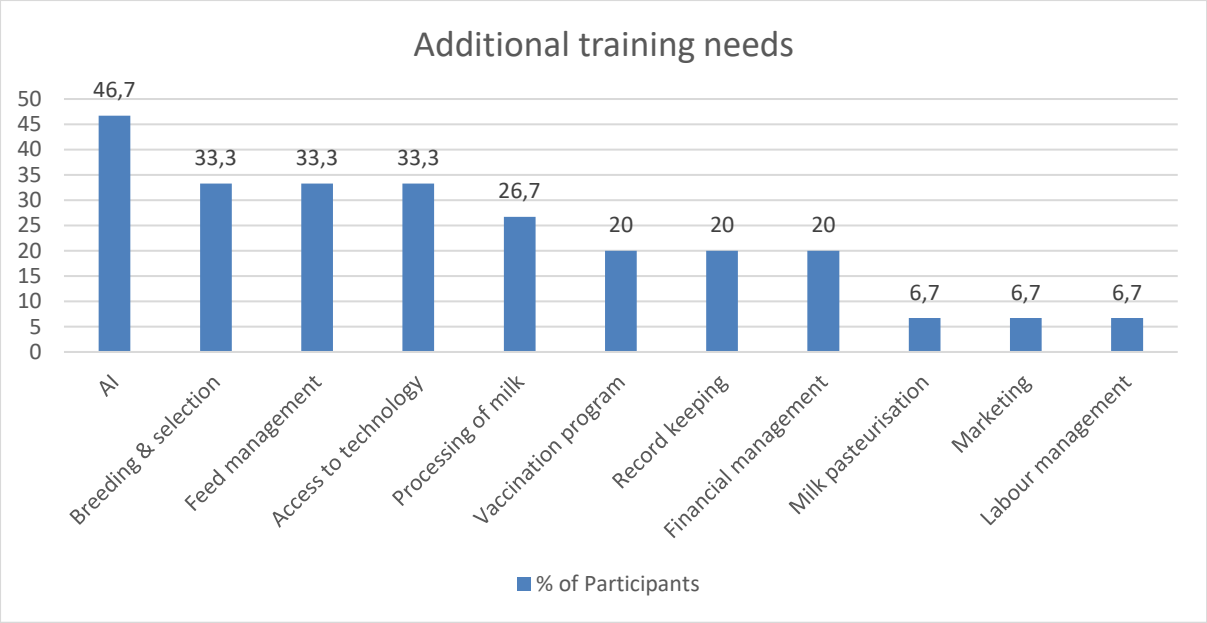

Figure 4.22: Additional training

4.2.6.2 *Skills that commercial dairy farmers have that emerging farmers are lacking*

As indicated in Figure 4.23 below, most participants mentioned that commercial dairy farmers have good financial and marketing skills and access to technology; however, they are deficient in these skills.

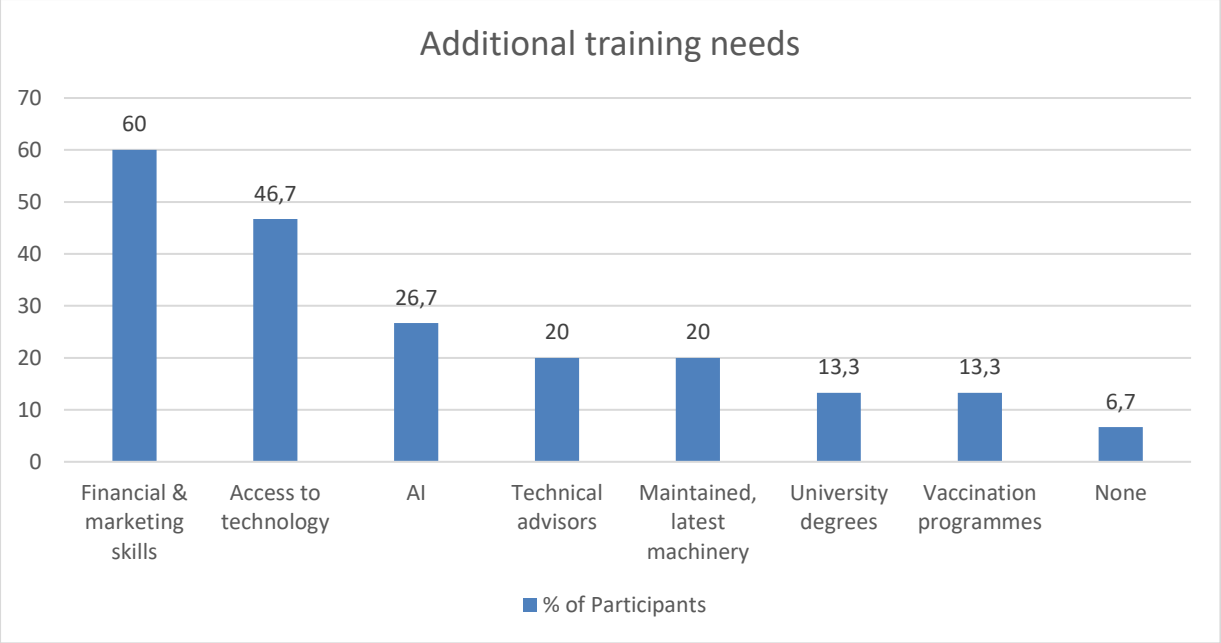

Figure 4.23: Perceived commercial dairy farmers skills

4.2.7 Opportunities for commercialisation of emerging dairy farmers

As shown in Figure 4.24 below, most case study participants (73%) stated that opportunities existed to become commercial farmers. Only 27% said they did not believe they could become commercial farmers due to a lack of government support. They highlighted low milk prices, imports of dairy products and hesitancy by banks to finance them as major factors militating against opportunities for their commercialisation. One participant went on to say that he leases the farm and cannot put in permanent infrastructure.

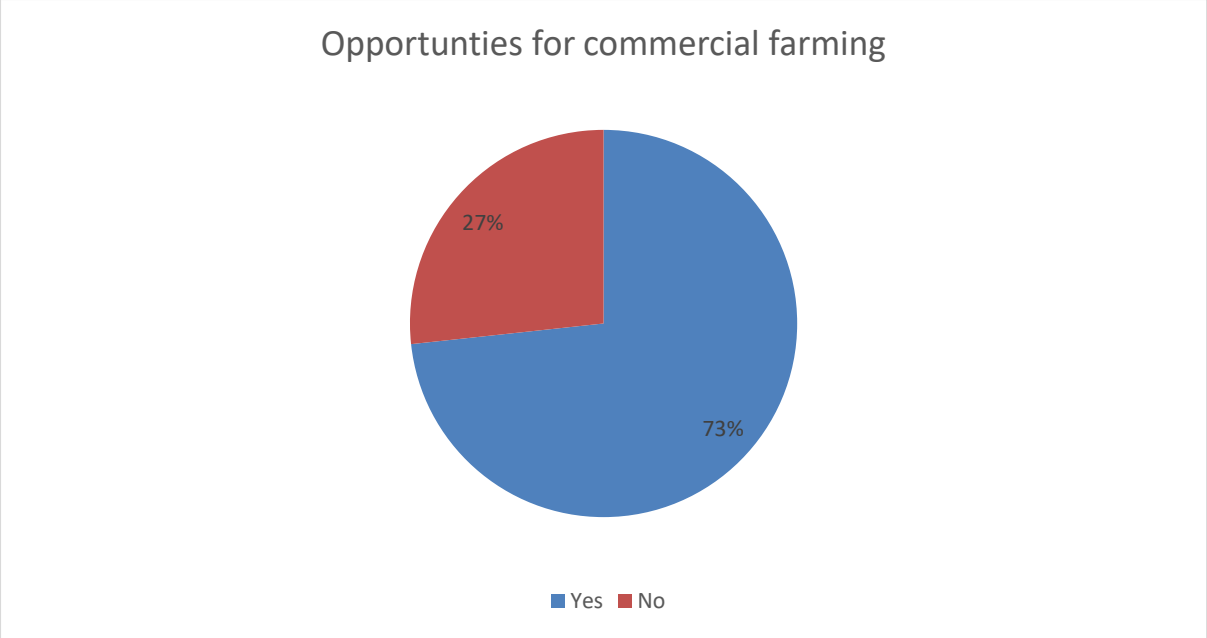

Figure 4.24: Opportunites for commercial farming

As shown in Figure 4.25 below, case study participants highlighted adding value to their milk, selling milk directly to consumers and accessing local markets such as schools and rural communities as the major opportunities to commercialise them.

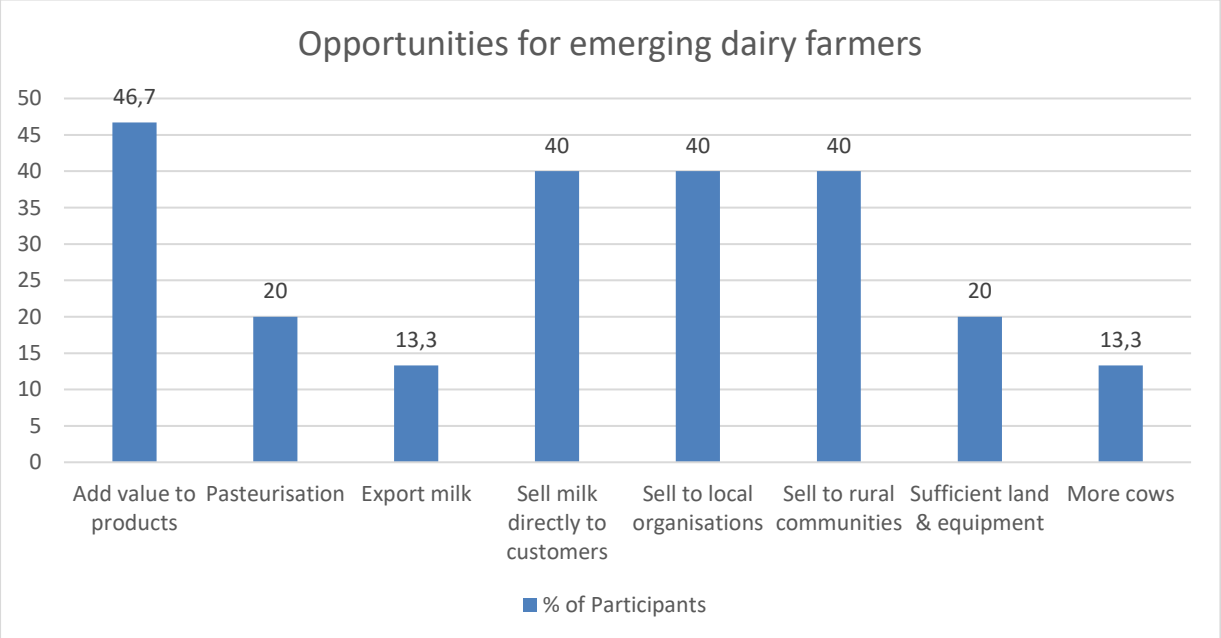

Figure 4.25: Opportunites for emerging dairy farmers

4.2.8 Access to institutional support services

Most case study participants indicated they had access to dairy extension services, as shown in Figure 4.26 below (87%).

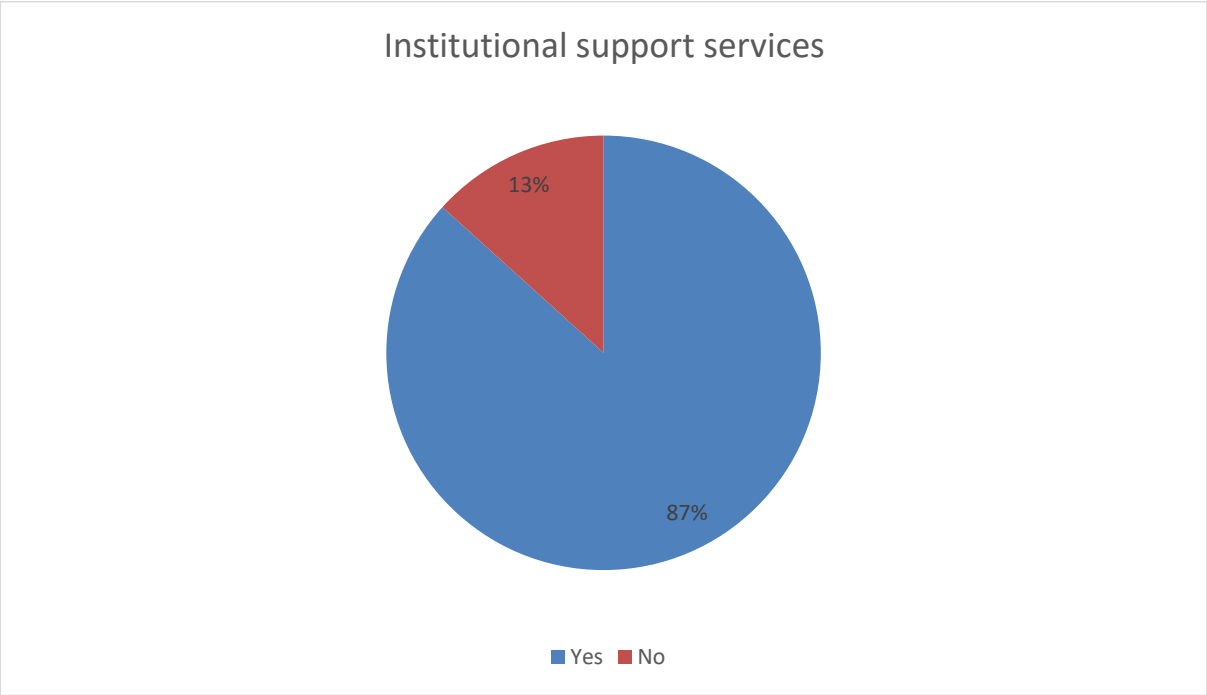

Figure 4.26: Access to institutional support services

As shown in Table 4.9 below, most case study participants reported receiving assistance from the Agricultural Research Council (ARC) through the milk recording scheme. Most participants stated that they do not receive Government extension services because Agricultural Advisors always claim that the government does not have money and no transport to visit the farms. They also lack skills in dairy production.

Table 4.9: Forms of institutional support provided

	% of participants who said yes (n=13)
Extension advisory services	23,1%
Veterinary services	30,8%
ARC	
Milk recording/ analysis	53,8%
Farmer days	7,7%
Nestle	
Water tanks	7,7%
MilkSA	
Training/ Short courses	38,5%
Vaccinations	15,4%
MPO	
Training/ short courses	15,4%
Fodder management	7,7%

4.2.9 Dairy business model

As shown in Figure 4.27 below, most participants (93%) believe that the dairy business model could help them become commercial farmers.

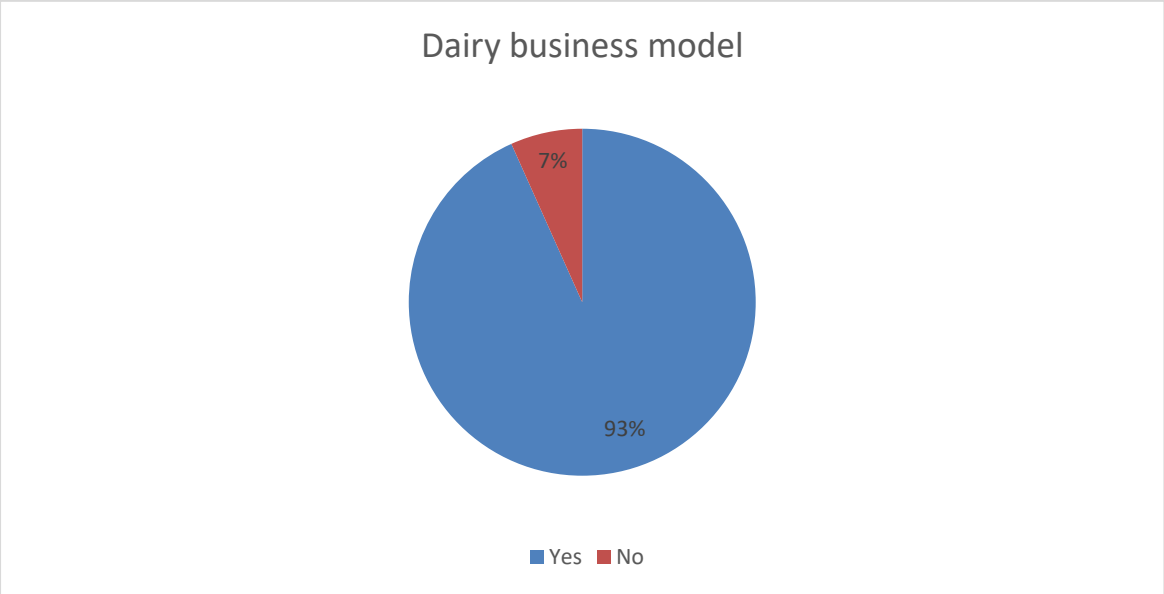

Figure 4.27: Dairy business model

4.2.9.1 Advantages and disadvantages of the dairy business model

As shown in Figure 4.28 below, the most highly valued benefit of the dairy business hub model by the case study participants was that it would reduce input costs through bulk buying. Other highly ranked advantages included knowledge and skill sharing, risk and return sharing and increased milk production. One participant, who did not believe in the dairy business model, felt that successful implementation of the model would be hampered by the fact that most black farmers do not have experience working in groups. The farmer intimated that there is corruption, and blacks want to be all leaders.

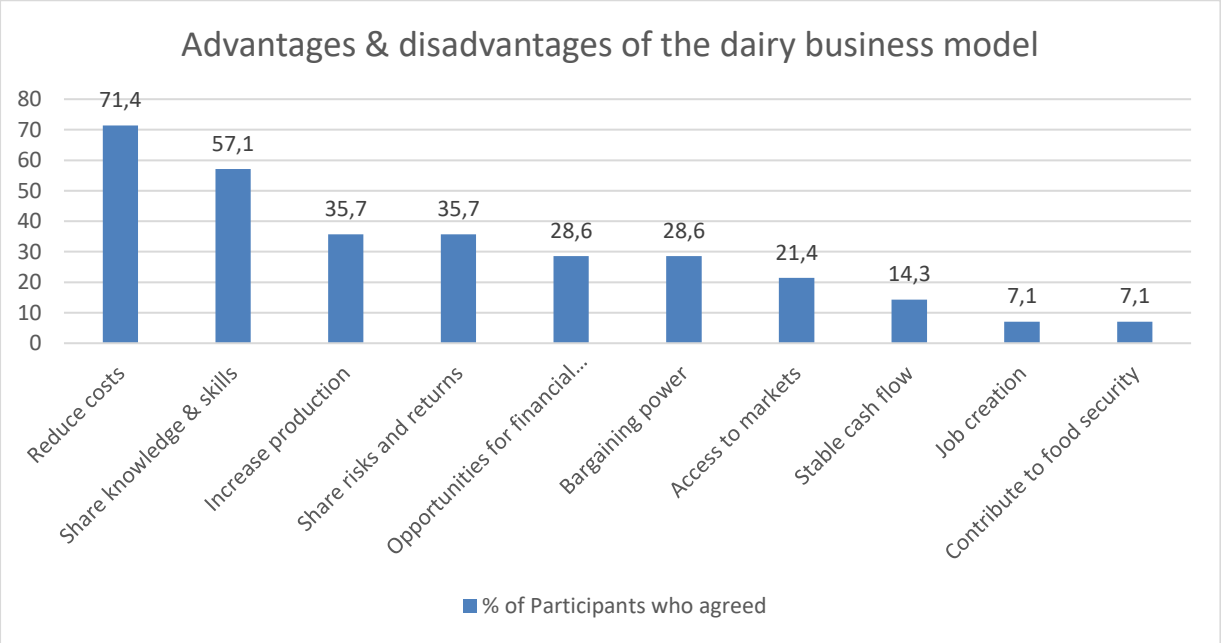

Figure 4.28: The advantages and disadvantages of the dairy business model

4.3 FOCUS GROUP INTERVIEWS

Question 1: What is your experience of the challenges that affect the commercialisation of emerging dairy farmers?

Focus group participants indicated that dairy farming is generally challenging and is currently going through a difficult time. The main point stressed by the dairy specialists was that emerging dairy farmers require support, particularly financial assistance.

They noted that most emerging dairy farmers lack capital and are also unable to access credit. One participant stated:

> *"If they could have a farm registered in their name and borrow capital using the farm as security, that would put them on a sound footing towards commercialisation".*

Focus group participants further indicated that emerging dairy farmers require support in terms of training; therefore, extension services should be improved to cater for this need. One participant commented:

> *"Extension services need to be improved as they play a critical role in transferring knowledge to the emerging dairy farmers".*

The focus group participants identified limited market access and inadequate intellectual capital and technology as the other challenges emerging dairy farmers face. Corruption and the current health situation (state laboratories not operating) were also mentioned.

Question 2: To what extent are the challenges of emerging dairy farmers different from those of commercial farmers?

Focus group participants felt that many challenges are similar for emerging and commercial dairy farmers, especially the smaller commercial farmers. However, focus group participants noted that commercial farmers have more capital and financial and technical knowledge and can access loans. Many emerging dairy farmers do not own their farms, and one of the participants remarked that:

> *"When compared to a commercial dairy farmer, the farmer is the person in charge of the farm. However, in the case of the emerging dairy farmer, the owner is not in charge of the farm, and the manager there is not knowledgeable. Most emerging dairy farmers are business owners, teachers, or politicians".*

Question 3: Do you think that there are prospects for commercial farming for emerging dairy farmers? Please explain your answer to that.

The general feeling among focus group participants was that there is always a possibility for emerging dairy farmers to become commercial farmers. This can be improved if emerging dairy farmers can enter niche markets, as mentioned by one participant:

> *"Emerging dairy farmers can develop a niche market for themselves. I think that would increase their chances of developing into commercial farmers".*

Question 4: What policies should be put in place to support the commercialisation of emerging dairy farmers?

The focus group participants singled out land transfer as the most crucial policy matter requiring attention to support the commercialisation of emerging dairy farmers. They emphasised that it was important for emerging dairy farmers to get land registered in their names, and a suggestion was made to do this in a stepwise manner:

> *"If the government notice that the emerging dairy farmer is making a success, then there must be a second step above that to make more capital available for the farmer to grow more and make sure that the farmer is commercially successful. And that can be done by financial support from the government".*

Putting in place, a monitoring process was suggested as another form; with one participant advising:

> *"Get the right people, and then the right people will be able to monitor the progress".*

There was a strong leaning towards training. Training is required and was suggested in the form of mentorship. Furthermore, it was stated that farmers farming together should form a constitution as mentioned by another participant:

> *"Every farmer on the farm can follow the constitution so that there's no individual that is going to come up with the different ideas".*

Question 5: Do you think that the dairy business model can help commercialise emerging dairy farmers?

Most focus group participants favour the dairy business model and thought it could help commercialise emerging dairy farmers. Focus group participants also suggested that emerging dairy farmers business models could focus on a niche market since commercial dairy business models were already focusing on ‘mega’ milk buyers. Concern was, however, expressed about the implementation of the dairy business model.

4.4 SUMMARY

The results and findings from the information provided by emerging dairy farmers and dairy specialists have been presented in this chapter. These were based on semi-structured interviews, followed by focus group interviews. The following chapter discusses these results, ending with conclusions that can be drawn from the study and appropriate recommendations.

CHAPTER 5 :
DISCUSSION

5.1 INTRODUCTION

This study aimed to identify factors that influence the commercialisation of emerging dairy farmers in the Free State Province and to assess the potential to use dairy business models to address the identified factors. The results and findings of this case study, as reported in chapter four (in light of the relevant literature), are discussed.

5.2 DISCUSSION REGARDING THE RESEARCH QUESTIONS

The discussion will now be dealt with by revisiting the research questions formulated in Chapter one. The following fundamental questions were framed in this research:

1. What are the challenges influencing the commercialisation of emerging dairy farmers in the Free State Province?
2. What are the opportunities for the commercialisation of emerging dairy farmers in the Free State Province?
3. What strategies can be used to assist emerging dairy farmers to become commercial farmers?
4. How can dairy business hub models help to commercialise emerging dairy farmers in the Free State Province?

These questions were adequately addressed, as indicated by the results and findings from the semi-structured questionnaire and focus group interviews reported in Chapter four.

5.2.1 What are the challenges influencing the commercialisation of emerging dairy farmers in the Free State Province?

The study revealed that the major challenges affecting the commercialisation of emerging dairy farmers included access to financial support, access to markets, infrastructure, milk price and managerial skills.

5.2.2.1 Access to financial support

Lack of access to financial support for capital and operational purposes was picked out as a major stumbling block to the commercialisation of emerging dairy farmers. While most of the study participants had received in-kind support from the Department of Agriculture in the form of infrastructure, livestock and planted fields, some of them had experienced difficulty obtaining bank loans due to them not having title deeds or because of old age. This challenge was confirmed by the focus group discussions, which revealed that emerging dairy farmers lack capital and have problems accessing finance. One focus group participant suggested that:

> *"A possible solution would be for the emerging dairy farmers to register the farms in their names. This would improve their ability to obtain financial support from financial institutions and thus improve their chances of commercialisation".*

These findings are consistent with the results of previous studies, such as Sebola (2018), who found that a lack of clear land rights for emerging farmers in South Africa is a barrier to obtaining finance. A primary factor hindering emerging farmers in South Africa from obtaining loans is land ownership as a basis for equity, followed by their lack of financial management skills (Mtombeni, Bove and Thibane, 2018). Many emerging dairy farmers do not own their land; instead, they are only granted permission to use it. They, therefore, cannot use their land as security for financing because they do not have clear land rights.

Louw (2013) noted that the lack of access to funding makes it difficult for emerging dairy farmers to invest in milking parlours and good breeding practices. As stressed by Meissner *et al.* (2013), financial support is the foundation of any commercial enterprise. Any efforts to commercialise emerging dairy farmers in South Africa should, therefore, look at ways to facilitate their access to finance. This could be achieved by, for example, the government providing the farmers with loans or loan guarantees. Alternatively, emerging dairy farmers need to be made aware of various funding opportunities by organisations such as National Development Agency, National Empowerment Fund and Industrial Development Corporation.

5.2.2.2 Access to market

Access to markets is documented as a major constraint to the commercialisation of emerging dairy farmers in the literature (Arias et al., 2013; Khapayi et al., 2016; Meissner et al., 2013; Mtimet et al., 2016; Musitini et al., 2019; Obi et al., 2012). As Wiggins and Keats (2013) observed, factors such as distance, low productivity, low milk prices and a lack of market information are major barriers to smallholder emerging dairy farmers' participation in markets. Market access was, however, seemingly not a major challenge in the current study, as most of the participants were selling their milk to established milk buyers like Nestle. Nevertheless, a few participants could not sell their milk through this channel because the milk buyer stopped buying from them due to low quantities or long distances to the farms. This problem was confirmed in the focus group discussions, which revealed that some emerging dairy farmers had limited market access. It would therefore appear that, although the formal market is accessible to most farmers, it is not dependable as the milk buyers can terminate the contracts. This problem is compounded by the fact that dairy farmers in South Africa operate in an unequal market system controlled by four big processors, which makes participation in the dairy value chain challenging for emerging dairy farmers (DAFF, 2018).

5.2.2.3 Infrastructure

A significant challenge faced by emerging dairy farmers, which is related to access to finance, is the lack of or inadequacy of essential infrastructure (DAFF, 2018). The current study showed that the shortage of infrastructures such as storage facilities, farming implements, weighing scales, milk tanks, bathroom facilities, water, artificial insemination flasks and roads is a major impediment to the commercialisation of emerging dairy farmers. Most participants highlighted this as a major problem affecting their businesses. These results resonate with those from an earlier study by Louw (2013), who identified infrastructures such as milking parlours, milk storage facilities, electricity and water availability as the most critical factors impacting the commercialisation of South African emerging dairy producers. Sikwela (2013) noted that the South African government does not provide adequate infrastructure support to emerging dairy farmers.

A poor road and transport system was pointed out as the most severe infrastructural obstacle affecting emerging dairy farmers. This problem was also highlighted in a recent study in Kenya, which found that poor rural roads have resulted in high transport costs for smallholder dairy farmers' goods to market and farm inputs, affecting farmers' competitiveness (Migose et al., 2018). A good road and transport system is critical for market access and is essential for distributing inputs and products to and from farms.

5.2.2.4 Milk price

Low milk prices have been singled out as a major cause of the poor viability of dairy farming in South Africa, which has led to a sharp decline in the number of dairy producers in the country in recent years (Milk SA, 2019). The majority of participants in this study expressed dissatisfaction with the milk price. It was generally felt that the average price of R4.93/ℓ is too low to compensate for the high cost of inputs such as fuel, electricity, labour and feed. Some participants had stopped milking because of poor viability due to the low milk prices.

Bunce (2020) observed that unsatisfactory milk prices usually arise because processors do not consult dairy farmers or farmer organisations when determining the milk price. As noted by DAFF (2018), emerging dairy farmers are forced to take whatever price the milk processors offer because of the dairy industry's pricing dynamics and the limited shelf life of milk. Imports of milk and dairy products into South Africa have also contributed to low producer pricing, making it difficult for emerging dairy farmers to break into the market (DAFF, 2018).

5.2.2.5 Dairy management skills

Lack of management skills has been widely reported in the literature as a major impediment to the commercialisation of emerging dairy farmers (Banda et al., 2021; Louw, 2013; Mbanjwa, 2016; Miyanda, 2018). The focus group discussions supported this view. Surprisingly, the case study participants generally believed they were well equipped with dairy management skills, with the majority indicating that they had good farm planning skills. As reported by other researchers (Mbanjwa, 2016; Miyanda, 2018), artificial insemination was highlighted as a highly desirable skill for the

commercialisation of the farmers. Also, in concurrence with other previous studies (Banda et al., 2021; Louw, 2103; Mbanjwa, 2016), breeding, selection, and feed management were critical skills.

Interestingly, participants recognised access to technology as a major requirement. This might indicate that the farmers are aware of technological advances, such as assisted reproduction, which can contribute significantly to their commercialisation. The fact that one of the participants had an automatic milking parlour probably means that the farmers are keen to use advanced technologies, provided that they can afford them.

The participants believe that commercial farmers have the advantage of possessing financial and marketing skills and access to technology, hence their ability to operate more profitable enterprises. This point was reinforced by the focus group discussions, which revealed that commercial farmers are better equipped with financial and technical knowledge, which gives them a competitive edge over emerging dairy farmers. DAFF (2018) supported these findings, noting that most smallholder and emerging dairy farmers lack financial and marketing capabilities.

5.2.2 What are the opportunities for the commercialisation of emerging dairy farmers in the Free State Province?

Most participants were positive that opportunities existed for them to become commercial dairy farmers. The same sentiment was echoed by the focus group discussions, which suggested that emerging dairy farmers have the potential for commercialisation, provided they receive government support on aspects such as infrastructure, financial assistance and market access. Structural support, or the provision of policy advice and a supportive national and international market environment, was also identified by Meissner et al. (2013) as a critical requirement. The need for government support to empower emerging farmers to capitalise on existing opportunities for commercialisation was also underlined by Khapayi et al. (2016). Support rendered to most of the farmers by the Free State Department of Agriculture in the form of infrastructure, cattle and planted fields to most participants was, therefore, considered to be of great value.

Participants noted that an opportunity exists for them to commercialise through increased revenue by adding value to their products through pasteurisation, exporting milk and selling their milk directly to local markets such as schools and rural communities. As observed by DAFF (2018), the demand for milk exceeds supply and the demand for raw milk is expected to grow in South Africa, thus presenting an opportunity for emerging dairy farmers to enter the market for fresh milk. Producing large volumes of high-quality milk for the formal market or pasteurising and selling directly to consumers would increase the emerging farmers' revenue. Focus group discussions indicated that developing a niche market would also increase remerging dairy producers' revenue, thereby creating a good opportunity for their commercialisation. Markets such as selling directly to small cafes and street vendors would cut the value chain and increase earnings. A few of the case study participants were not confident about the possibility of them becoming commercial farmers due to a lack of government support. This supports the findings of Khapayi et al. (2016), who concluded that South Africa's emerging farmers have few opportunities in the agricultural sector because of a lack of government support.

5.2.3 What strategies can be used to assist emerging dairy farmers to become commercial farmers?

5.2.3.1 State subsidies

Government support, in the form of subsidies, was proposed by most case study participants as an effective approach to facilitate their commercialisation. They suggested that the government subsidise their inputs to help improve their profit margins. Substantial state subsidies and support programs were provided to commercial farmers by the previous South African government. Chikazunga & Paradza (2012) pointed out that this strategy resulted in the rapid growth of the agricultural economy. Unfortunately, the removal of these subsidies in 1997, and the deregulation of the agricultural sector following the democratic transition in 1994, created significant challenges for farmers, particularly previously disadvantaged farmers (Chikazunga et al., 2012). Assistance programs and state subsidies have also worked well and benefited the agricultural economies of the United States of America and Europe (Khapayi et al., 2012). Thus, this is a tried and tested approach, which is

likely to work if it is brought back and implemented properly. A unique subsidy scheme, explicitly targeted at emerging dairy farmers, could be applied to expedite their development into commercial producers.

5.2.3.2 Banning of milk imports and regulation of milk price

Imports of milk and dairy products came out as a stumbling block to the development of emerging dairy farmers, and some of the case study participants felt that these imports should be banned. This should be understood against the background of an estimated 75 600 tonnes of milk being imported into South Africa in 2019, as reported by Milk SA (2020). Dairy product imports were highlighted as a danger to the livelihoods of Zambia's smallholder dairy producers by Louw (2013). Dairy products from European Union nations were making their way into the Zambian market at lower costs than Zambian farmers could produce them. In response to this threat, an agricultural policy was developed to reinforce trade barriers preventing unfair competition from inexpensive dairy products entering Zambia (Louw, 2013). Thus, a similar approach can be implemented in South Africa to protect emerging dairy farmers and the entire dairy industry. Large numbers of commercial dairy farmers have gone out of business, citing poor viability due to low milk prices as the main reason.

The participants also submitted that the government should assist in improving their viability by regulating the producer price of milk. This proposal is consistent with Mbanjwa's (2016) observation that dairy farm viability in South Africa has suffered since the deregulation of marketing/control boards in 1997, resulting in a decrease in the number of emerging dairy producers. Due to economies of scale, processors changed their procurement patterns during deregulation and began purchasing less from smaller milk producers. This has lowered the contribution and efficacy of emerging dairy farmers in the economy (MPO, 2017). A sound approach to milk price regulation, which South Africa could follow, is the one used in New Zealand, the world's most efficient milk producer, where prices are set by an independent ombudsman (MPO, 2021).

5.2.3.3 Access to land

Land ownership has been identified as a primary limiting factor in the development of emerging dairy farmers (Kepe & Hall, 2016). This fact was reinforced by the case study participants and focus group discussants, who recognised access to productive land as a crucial requirement for emerging dairy farmers to realise the benefits of agricultural growth. Lack of ownership rights has led to such farmers failing to access finance, so it was recommended that a phased process should be followed to register the land under their names.

5.2.3.4 Improvement of extension services

Access to quality training and extension services has been recognised as a key to the commercialisation of emerging dairy farmers (Staal, 2019; Strydom, 2016). Although the case study participants indicated that they had access to extension services, they were however not satisfied with the competence and knowledge level of the Agricultural Advisors on critical aspects of dairy farming. The focus group discussants also stressed the need to provide high-quality extension services to emerging dairy farmers. Emerging farmers can contribute to enhanced agricultural growth, rural development and improved farm income if they have proper access to farmer support services. Khapayi et al. (2016) noted that providing support services is still one of the essential interventions in the agricultural sector for rural development, commercialisation, food security, poverty reduction, and income generation for emerging dairy farmers. The right balance between direct government involvement and private sector initiatives is critical to developing efficient extension services.

5.2.4 How can dairy business hub models help to commercialise emerging dairy farmers in the Free State Province?

Most case study participants accepted the dairy business model as a possible means to commercialise them, and the focus group discussions concurred with that view. However, implementing the dairy business model was a source of concern. A significant advantage observed was the ability of the dairy business model to reduce costs by allowing farmers to buy inputs in bulk or collectively, which agrees with the

assertion by Van der Lee et al. (2018) that it can improve smallholder dairy producers' input and output selling chances. By integrating numerous supply chain participants into the DBHM, transaction costs can be reduced, and smallholder dairy producers can access more traditional markets. Smallholder dairy farmers should expect profit growth from economies of scale, business simplicity, and negotiation muscle. Input suppliers, service providers, and processors can profit from DBHM by working with large groups of smallholder dairy farmers at a low cost. Other advantages identified by the case study participants included sharing of knowledge and skills, sharing of risks and returns, and increased marketing volumes. In a study on Hub Models (DBHM) in East Africa and Pakistan, Omolo's (2012) summarised the benefits of the dairy hub model as its ability to address problems faced by smallholder dairy farmers such as a lack of access to breeding services, feed, animal healthcare, production inputs and appropriate information.

The focus groups suggested that the dairy farmers' business model may focus on drawing the interest of emerging dairy farmers and exploiting niche markets, in the same way that commercial dairy business models focus on 'mega' milk customers. School milk programs, when implemented with an emphasis on emerging dairy farmers as primary suppliers, may help dairy development while driving long-term demand for dairy products. When linked to local milk consumption, the successful implementation of schemes like these can aid in commercialising emerging dairy farmers. In China, Thailand, Mongolia, and the Philippines, investments in school milk programs, financial support for industry expansion, and favourable credit and taxation policies to support breeding stock purchased by smallholder dairy farms have contributed to a double-digit increase in milk production over the last decade (Morgan, 2009).

CHAPTER 6 :
CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

This chapter summarises the most important conclusions that can be drawn from this study, with a particular focus on the research questions. In addition, recommendations on how the research findings may be applied in formulating policies or programmes for commercialising emerging dairy farmers are made. The new knowledge contributed by the study and remaining gaps that warrant future research are also highlighted.

6.2 CONCLUSIONS

The conclusions that can be arrived at, based on the study results, will now be presented by succinctly answering each of the initial research questions. These conclusions can be summarised as follows.

6.2.1 What are the challenges influencing the commercialisation of emerging dairy farmers in the Free State Province?

It can be concluded that the main constraints affecting the commercialisation of emerging dairy farmers in the Free State Province are a lack of financial support, limited access to reliable markets, a lack of infrastructure, low milk prices, and a lack of appropriate management skills.

6.2.2 What are the opportunities for the commercialisation of emerging dairy farmers in the Free State Province?

There appear to be bright prospects for the commercialisation of emerging dairy farmers in the Free State Province. This can be accomplished by providing various forms of government assistance, adding value to their milk through pasteurisation and product development, and exploring direct local markets such as schools and rural communities.

6.2.3 What strategies can be used to assist emerging dairy farmers to become commercial farmers?

Approaches that can be adopted to expedite the process of commercialising emerging dairy farmers include tighter regulation of milk imports and prices, provision of government subsidies or incentives, ensuring access (and ownership) to land, and rendering good extension services.

6.2.4 How can dairy business hub models help to commercialise emerging dairy farmers in the Free State Province?

Dairy business hub models offer a wide range of benefits that make them an appealing vehicle for commercialising emerging dairy farmers in the Free State Province. Caution would, however, need to be taken to ensure that such models are appropriately implemented, given the complex group dynamics involved.

6.3 RECOMMENDATIONS

The following recommendations are based on the research findings and literature review:

- Access to finance for emerging dairy farmers is widely regarded as one of the major barriers to commercialisation. Commercial banks demand that farmers borrowing from them cede the title deeds to the land they occupy as collateral. Most emerging dairy farmers, however, do not possess such land title documents. Therefore, the study recommends that the government, which owns most of the land used by emerging dairy farmers, transfers ownership of the land to the farmers. Alternatively, financial institutions can be requested to amend their lending conditions to accommodate emerging dairy farmers. Furthermore, funding institutions such as the Land Bank, which provide unsecured loans, should be explored as an alternative. Such institutions potentially have a critical role in financing the operations of these dairy farmers, in the absence of full title deeds.

- Lack of infrastructure stands out as one of the significant challenges faced by emerging dairy farmers. Therefore, the government should put more effort into developing infrastructures such as road networks, milking parlours, electricity, milk tanks, animal handling and housing facilities, water quality and availability, milk storage, and artificial insemination flasks.
- In order to improve their revenue, it is recommended that emerging dairy farmers explore high-value niche markets for their milk. Potential markets include local institutions such as schools and selling directly to consumers or retailers. This can help by generating long-term demand for their milk and dairy products, as well as improving the farmgate price of their milk.
- Emerging dairy farmers are receiving low prices for their milk, which is attributed to the country's prevailing marketing system and imports of milk and dairy products. Therefore, it is recommended that the government develops policies to regulate the price of milk and the importation of milk and dairy products.
- In order to overcome the problem of poor viability due to the low milk prices, it is recommended that the government considers supporting emerging dairy farmers by subsidising their production inputs. Such subsidies and support programs helped to improve the agricultural economy in the past when they were provided to commercial farmers under the previous South African government. The government could also help to enhance the viability of emerging dairy businesses by providing structural, financial and market access assistance.
- Land reform is essential for agricultural growth and the successful commercialisation of emerging dairy farmers in the Free State Province. Besides failing to use their land as collateral to acquire finance, emerging dairy farmers cannot invest in land upgrades or expand their enterprises since they do not own the land. It is therefore suggested that the Department of Agriculture, Land Reform and Rural Development (DALRRD) considers distributing land, including ownership, to emerging dairy farmers.
- Access to high-quality extension services has been highlighted as a key to commercialising emerging dairy farmers in the current and other previous studies. Such services are essential as they contribute to increased agricultural growth, rural development and farm profitability. Thus, it is recommended that

all extension service providers should put additional effort into strengthening their services to emerging dairy farmers.

- Strong partnerships among the various stakeholders are recommended for the successful commercialisation of emerging dairy farmers. Although it is accepted that the government will need to play a central role in such partnerships, there is also a wealth of experience and expertise in the private sector which can be drawn on. It is, therefore, logical to explore the possibilities of pursuing some public-private partnerships, where all the partners are equally important. Aspects such as skills development, training, technology transfer and mentorship, formally involving commercial dairy farmers, are critical in the effectiveness of such long-term partnerships.
- The Dairy Business Hub Model stimulated considerable interest in the current study; hence it is recommended that its implementation in South Africa be investigated. Its multiple benefits include the possibility to boost input and output marketing possibilities, the potential to access more traditional markets, increased profit from economies of scale, simplicity of business and bargaining power. The DBHM concept is particularly appealing due to the fact that it has properties that render it capable of addressing many of the challenges experienced by emerging dairy farmers, such as a lack of access to breeding services, correct feeding, animal healthcare, production inputs and relevant information.

6.4 CONTRIBUTION TO KNOWLEDGE

Prior to the current study, there had been no formal research regarding the commercialisation of emerging dairy farmers in the Free State Province. This study, therefore, generated new knowledge which may assist in developing sound strategies for commercialising emerging dairy farmers in South Africa. It also supplements the existing body of knowledge on emerging dairy farmers in general.

This study's significant findings provide insight into emerging dairy farmers' unique attributes based on properly planned and executed scientific research. The definition of “emerging dairy farmers” used in the study provides the context for the characteristics of this important class of farmers in South Africa. The commercialisation

of these farmers can contribute towards increased rural income growth, employment creation, economic development, improved livelihoods, and poverty alleviation is apparent, as documented in the literature.

Although there was some prior knowledge about the challenges faced by emerging dairy farmers, this study conducted an in-depth investigation into the subject using a structured scientific approach. This revealed some nuances related to emerging dairy farming in the Free State Province, which had not been known from the farmers' perspective.

Through a systematic identification of existing opportunities for commercialising emerging dairy farmers, the study developed knowledge that can serve as a reliable basis for formulating strategies to develop the emerging dairy sector. Such strategies may be underpinned by adopting the dairy business hub model, which would bring together several stakeholders (DALRRD, ARC, SA Stud Book, Milk SA, MPO and other related stakeholders) with a shared goal to commercialise emerging dairy farmers in the Free State Province.

6.5 LIMITATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

The case study generated much interest; however, it had its limitations. By its very nature, a case study has the limitation that its findings cannot be generalised to a broader group. The study only included emerging dairy farmers from the Free State Province, which does not reflect the situation in South Africa as a whole. Thus, the conclusions drawn from the current study cannot be extrapolated to the rest of the country.

In many respects, the research provides a foundation for future research on the commercialisation of emerging dairy farmers. An interesting research extension would be to conduct a study including emerging dairy farmers from all the provinces of South Africa. This will provide a better understanding of emerging dairy farmers' challenges and opportunities at a national level. It would also be interesting to conduct research on the feasibility of implementing the Dairy Business Hub Models for emerging dairy farmers in South Africa.

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APPENDICES

APPENDIX 1: GHREC APPROVAL LETTER

UNIVERSITY OF THE FREE STATE
UFS UV

GENERAL/HUMAN RESEARCH ETHICS COMMITTEE (GHREC)

12-Oct-2020

Dear Mr Karabo Molomo

Application Approved

Research Project Title:
Factors influencing the commercialisation of emerging dairy farmers in South Africa: A case study of the Free State Province.

Ethical Clearance number:
UFS-HSD2020/0426/0610

We are pleased to inform you that your application for ethical clearance has been approved. Your ethical clearance is valid for twelve (12) months from the date of issue. We request that any changes that may take place during the course of your study/research project be submitted to the ethics office to ensure ethical transparency. furthermore, you are requested to submit the final report of your study/research project to the ethics office. Should you require more time to complete this research, please apply for an extension. Thank you for submitting your proposal for ethical clearance; we wish you the best of luck and success with your research.

Yours sincerely

Dr Adri Du Plessis
Chairperson: General/Human Research Ethics Committee

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APPENDIX 2: EMERGING DAIRY FARMERS INTERVIEW QUESTIONS

TITLE: FACTORS INFLUENCING THE COMMERCIALISATION OF EMERGING DAIRY FARMERS IN SOUTH AFRICA: A CASE STUDY OF THE FREE STATE PROVINCE

Please tick the correct box or write the answer in the space provided:

SECTION A: PERSONAL INFORMATION

1. Name of farmer: _____
2. Name of farm: _____
3. Name of interviewer: _____
4. Date of interview: _____
5. Area or location of farm: _____
6. Signature of respondent: _____

SECTION B: BIOGRAPHICAL INFORMATION

7. Gender? ☐ Male ☐ Female
8. Marital status? ☐ Single ☐ Married ☐ Divorced
9. Age? ☐
10. Level of education: ☐ No formal education ☐ Primary education ☐ Secondary education ☐ Tertiary education

11. Source of income:

Dairy	Other agricultural activities
Salary/Pension	Other

12. Farm ownership

a. I own the farm	
b. I rent the farm	
c. Is it a government farm?	
d. Is it a community farm?	
e. Other, specify	

13. What is the total size of your farm_____(Ha) ?

14. Are you currently milking? Yes | No

15. If no to question 14:

    a. When did you stop milking?_____

    b. Why did you stop milking?_____

    _____

16. Type of breed: _____

17. Total Diary herd size: _____

18. How much milk do you produce on average daily? _____

19. Number of cows in milk: _____

20. Number of dry cows: _____

21. Number of heifers: _____

22. Type of milking parlour: _____

NB: Even if you are not currently milking, please complete the questionnaire from your perspective while you were milking

SECTION C: ACCESS TO FINANCIAL SUPPORT

23. Have you received any financial support? Yes | No

24. If yes to question 23, what kind of support?

_____

_____

_____

_____

25. If no to question 23, what are the reasons?

_____

_____

_____

_____

26. Have you at some point asked for advice on how to access financial support? Yes | No

27. If yes to question 26, whom did you consult? _____

28. If not to question 26, what are the reasons?

_____

_____

_____

_____

SECTION D: ACCESS TO MARKETS

29. Do you have a market for your milk? Yes | No

30. If yes to question 29, who do you sell your milk to? _____

31. If no to question 29, what are the reasons?

_____

_____

_____

_____

32. Suggest ways to overcome the challenges that influence access to market:

_____

_____

_____

_____

SECTION E: INFRASTRUCTURE

33. Do you have infrastructural challenges in your dairy enterprise?

Yes | No

34. If yes to question 33, list key infrastructure you need that you do not have:

_____

_____

_____

_____

_____

_____

SECTION F: MILK PRICE

35. How much do you get paid per litre of milk? _____

36. Are you satisfied with the price you are getting? | Yes | | No |

37. If no to question 36, what are the reasons?

_____

_____

_____

_____

_____

_____

_____

_____

38. Suggest ways to overcome the challenges that influence the price of milk:

_____

_____

_____

_____

_____

_____

_____

SECTION G: MANAGERIAL SKILLS

39. Do you have dairy management skills? Yes | No

40. If yes to question 39, complete the table below:

Managerial Skills	1 = Poor	2 = Average	3 = Good
Record keeping			
Animal breeding and selection			
Financial Management			
Marketing Management			
Labour Management			
Farm Planning			
Animal health and welfare			

41. If no to question 39, what are the reasons?

_____

_____

_____

42. Did you receive dairy skill training? Yes | No

43. If yes to question 42, was the training useful?

_____

_____

_____

_____

44. If no to question 42, what are the reasons?

_____

_____

_____

_____

45. Which additional training would help you progress towards commercialisation?

_____

_____

_____

_____

46. What skills/training do commercial dairy farmers have that you are lacking?

_____

_____

_____

SECTION H: OPPORTUNITIES FOR EMERGING DAIRY FARMERS

47. Do you have opportunities for commercial farming? | Yes | No |

48. If yes to question 47, what are those opportunities?

_____

_____

_____

_____

_____

49. If no to question 47, what are the reasons?

_____

_____

_____

_____

SECTION I: INSTITUTIONAL SUPPORT SERVICES

50. Do you have access to dairy extension services? Yes | No

51. If yes to question 50, what kind of services?

_____

_____

_____

_____

52. If no to question 50, what are the reasons?

_____

_____

_____

_____

SECTION J: DAIRY BUSINESS MODEL

53. Do you think the dairy business model can assist you in becoming a commercial farmer? Yes | No

54. If yes to question 53, list the major advantages of the dairy business model:

_____

_____

_____

_____

_____

_____

_____

55. If no to question 53, list the major disadvantages of the dairy business model:

_____

_____

_____

_____

_____

_____

_____

THANK YOU FOR PARTICIPATING

APPENDIX 3: FOCUS GROUP INTERVIEW GUIDE

TITLE: FACTORS INFLUENCING THE COMMERCIALISATION OF EMERGING DAIRY FARMERS IN SOUTH AFRICA: A CASE STUDY OF THE FREE STATE PROVINCE

1. What is your experience of the challenges that affect the commercialisation of emerging dairy farmers?
2. To what extent are the challenges of emerging dairy farmers different from those of commercial farmers?
3. Do you think that there are prospects for commercial farming for emerging dairy farmers? Please explain your answer to that.
4. What policies should be put in place to support the commercialisation of emerging dairy farmers?
5. Do you think that a dairy business model can help commercialise emerging dairy farmers? Please explain the answer.