



AN EXPLORATIVE STUDY OF RAW MILK CHAINS IN ZIMBABWE

A CASE OF SEKE DISTRICT.

**A Research Project Submitted to
Larenstein University of Applied Sciences
In Partial Fulfilment of the Requirements of Degree of Master in Agricultural
production Chain Management,
Specialization Livestock Production Systems**

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DEDICATION

I dedicate this work to my beloved children Tichamutendaneyi, Tichafara, Tichakunda, Tinotenda and Tinodiwa, who encouraged me during to take up my studies. I am proud of you guys how you managed by yourselves. I have set a standard for you and I wish you all emulate this. I love you all.

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LIST OF ABBREVIATIONS

COMESA	: Common Market for Eastern and Southern Africa
DDP	: Dairy Development Programme
DFI	: Direct Foreign Investment
DFID	: The Department for International Development
DHI	: Dairy Herd Improvement
DPLD	: Department of Livestock Production and Development
DZL	: Dairibord Zimbabwe Limited
ESAP	: Economic Structural Adjustment Programme
FMD	: Foot and Mouth Disease
GDP	: Gross Domestic Product
GNU	: Government of National Unity
ILRI	: International Livestock Research Institute
KCC	: Kenya Co-operative Creameries
LIT	: Livestock Identification Trust
NDC	: National Dairy Cooperative
NADF	: National Association of Dairy Farmers
PPP	: Private Public Partnerships
PO	: Producer Organisation
SADC	: Southern African Development Community
SHODFAZ	: Small Holder Dairy Farmers Association of Zimbabwe
SHG	: Self Help Groups
ZFU	: Zimbabwe Farmers' Union

ABSTRACT

The study to establish why the milk producers have shifted from selling their milk to the formal chain to sell their milk to the informal marketing chain in Seke District of Zimbabwe was conducted between the last half of July and the first half of August 2009.

The study was done in an effort to identify why the milk intake for dairy processing plants has continued to decline in the past decade and most processors are operating below capacity. To assess what is happening on farms a survey was conducted to check on who are farming, herd sizes, cow productivity and provision of essential services like transport; extension services; access to finance, milk marketing and regulation enforcement. The activities of the informal chain were checked with the vendors and Dairibord Zimbabwe Limited (DZL) for the formal chain.

Data for the study came from both secondary and primary sources. Herd data and milk marketing data was gathered from my survey and supplemented with data from the District Livestock Specialist of Seke District and the Information Management Unit in the Department of Veterinary Services. The study interviewed 44 farmers (using a structured questionnaire), 14 from Marirangwe SSCFA; 8 from Seke communal area ward 1 to 8; 11 from Beatrice and Harare South LSCFA and 11 from resettlement areas. Two open markets were visited and discussions were done informally with both vendors and consumers. Interviews were done with DZL officials; the milk supply manager, the business development manager and the Chief Executive Officer. For triangulation Central Statistical Office officials and DHI officials were interviewed.

The study reveals an estimated loss of about 25% of milk production to the informal chain. 70% of this milk is coming from communal and resettlement areas who are not linked to any formal markets while commercial farmers contribute the remaining 30% through side marketing. Access to services like quality commercial feeds, extension and veterinary services, finance, transport and good road network is difficult. The study shows that the future of dairy development in Zimbabwe depends on how successfully small holder farmers are included in the formal chain.

To support the revival of the dairy industry, recommendations made to government are change policy and regulations to include small holders in the formal chain, Non Governmental Organizations to facilitate capacity building of producers' organisations. Farmers Unions to link farmers to markets and ensure sustainability of small holder milk production, assist groups to increase their bargaining power in the market place and to exploit economies of scale in acquiring the marketing inputs such as feeds, access to credit; while processors can enter into public private partnerships and invest in developing the milk supply base. Processors should move to demand driven production; aim to supply products that are demanded by consumers rather than push their products into the market which is what has fuelled the informal chain.

Chapter 1: Introduction

1.1 Background

Zimbabwe, a landlocked country in south-central Africa, is slightly smaller than California. It is bordered by Botswana on the west, Zambia on the north, Mozambique on the east, and South Africa on the south. It extends from latitudes 15°37' S to 22°24' S and from longitudes 25°14' E to 33°04' E. Land area: 149,293 sq mi (386,669 sq km); total area: 150,804 sq mi (390,580 sq km). Population is estimated just above 13,000,000 and Harare is the largest city the metro has over 3,500,000. Literacy rate: 91% (2003 estimates.) Economic summary: GDP (2007 est.): \$2.211 billion; per capita \$200. Real growth rate: -6.1%. Inflation: 10,453% official data. Unemployment 80%

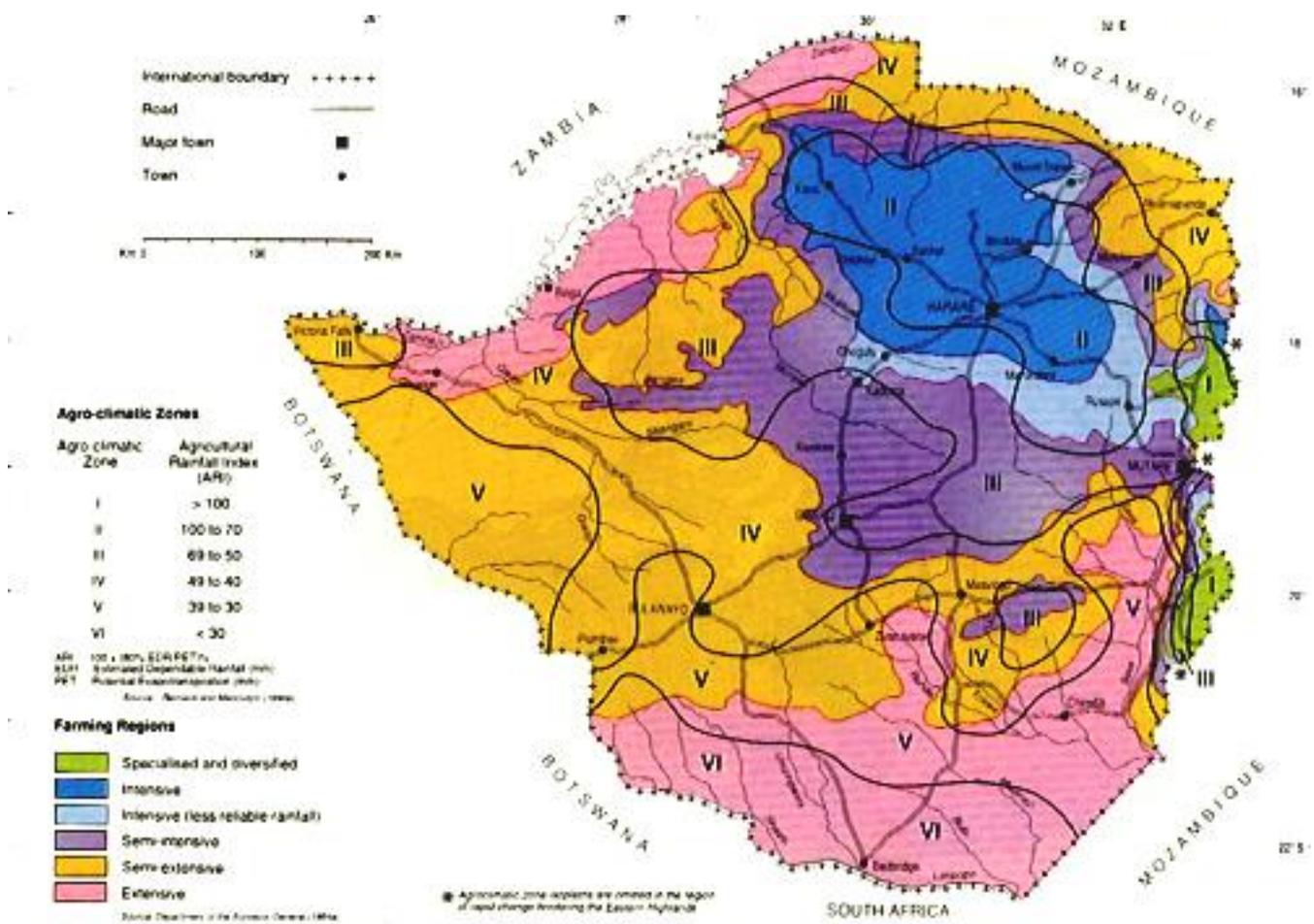


Figure 1: Agro ecological regions of Zimbabwe

Zimbabwe lies entirely within the tropics but much of the Highveld and Eastern Highlands have a subtropical to temperate climate due to the modifying effect of altitude. Three seasons are recognised in Zimbabwe. These are: (1) a hot wet season from mid- November to March (summer); (2) a cold dry season from April to July (winter), and a hot dry season from August to mid-November (spring).

(Vincent and Thomas 1960) divided Zimbabwe into five main agro ecological regions according to differences in effective rainfall. Commercial dairy is mostly in regions I, II and III. Zimbabwe has 6 dairy zones namely Chipinge, Mutare, Harare, Kadoma, Gweru and Bulawayo.

The Zimbabwean dairy industry has been declining for the last decade. Production, processing and marketing costs are higher (overheads) when volumes are low. Milk and dairy products become expensive as high production costs are passed on to the consumer and there is now low consumption of milk and dairy products as they become unavailable or too expensive. Local dairy products fail to compete with foreign products, which may result in cheaper imports replacing local products

The government introduced the Dairy Development Programme which is a parastatal organization as a move to alleviate poverty through smallholder dairy in communal and former purchase areas. The Dairy Development Programme (DDP) has since 1983 worked with 35 projects country wide helping them set up and they have a membership of over 5000 farmers. The proportion of large scale dairy farming has been greatly reduced and there more small scale dairy farmers today. This scenario has prompted the researcher's choice of study area; to find out how side marketing that is believed to contribute to most processors failing to get enough milk supply that has resulted in them operating way below their capacity. Are the milk quantities side marketed significant, why are farmers suddenly supplying this informal chain and what can be done to strengthen the formal milk chain and revive the once thriving dairy sector. As a dairy extension worker the researcher can contribute to strategies to resuscitate the dairy industry that has become unattractive to investors.

1.2 Problem Definition

Raw milk supply for processors in Zimbabwe has continued to decline and they are operating below capacity. Zimbabwe in 1990 milk production was 256 million litres/ year which utilized 70% processing capacity and in 2008 milk intake by processors was 50 million litres which utilize less than 30 % capacity. (MoA 2007) an analysis of causes if this decline in milk supply was identified side marketing as one of the causes. The reasons why farmers are side marketing include low producer prices, poor milk grades because of power shortages and high costs of disinfectants detergents and drugs. Low productivity because poor genetics, poor feed quality produced on farm, high costs of purchased feed and poor skills and knowledge of good dairy practice.

Milk volumes supplied to processors from registered producers continue to decline and **an informal milk chain has emerged.** Milk vendors who purchases milk from the farmers and sell in the open market and road sides along highways are on the increase whereas processors have problems are not getting enough milk for optimum utilization of their processing capacity. The City Health Department is chasing these vendors off the streets in a bid to protect consumers from unsafe milk they sell unpasteurised and naturally fermented; see picture below of an open market selling milk. The fermented milk is popular with consumers and they take it with sadza the staple food. The study will find out why the farmers choose alternative marketing channels and will be the basis for recommending possible ways to revive the dairy industry.



Figure 2: Vendors at an open market at Chikwanha selling milk

1.3 Justification of the study

Prior to the Agrarian Reform of 2002, the dairy industry comprised of relatively 375 large-scale producers accounting for 95% of marketed milk. The number of large scale dairy farmers has declined to the current 270 and milk volumes have declined from 2 56 million litres/ year in 1995 to 50 million litres in 2008.

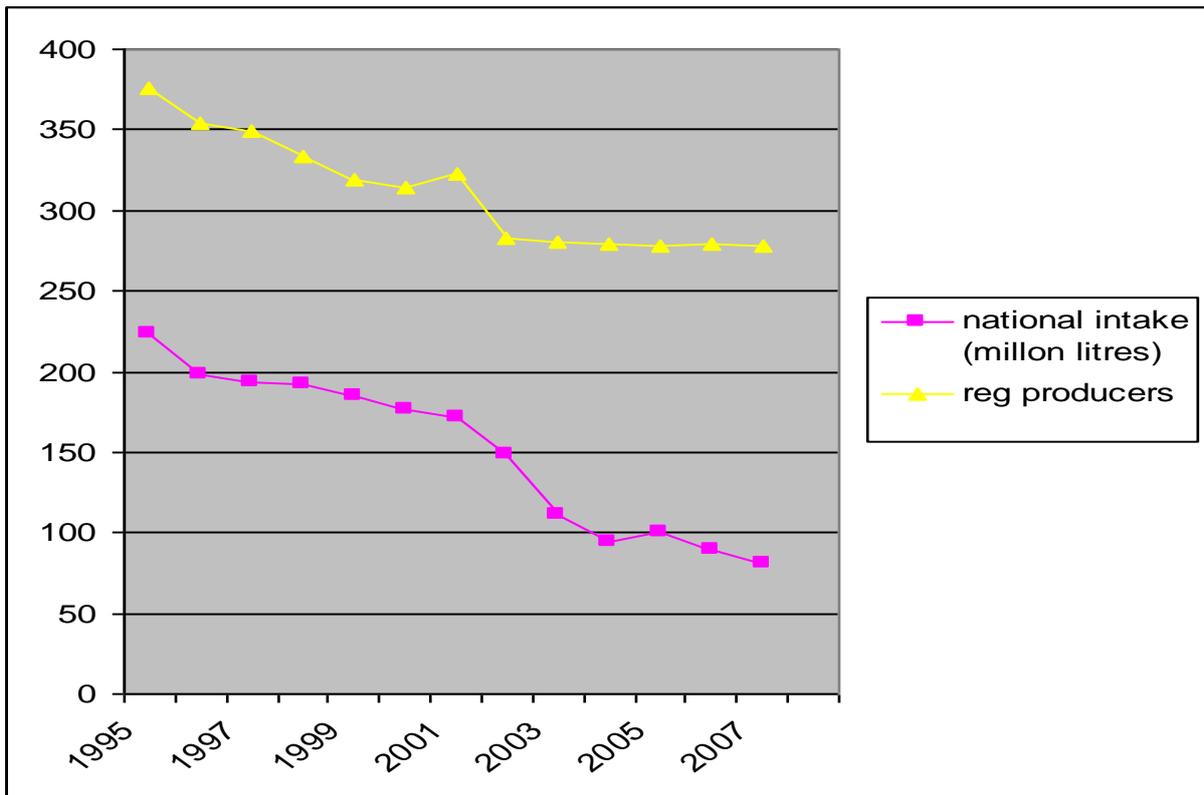


Figure 3: national milk intake and registered milk producers

Source: Computed from Dairy Services statistics.

The small scale producer contributes only 5 % of the milk intake from 35 the smallholder dairy projects have been established throughout the country by the Dairy Development Program (DDP), a parastatal organization. Despite the skills and knowledge small scale farmer's milk production continues to decline and processors are facing the challenge of capacity under-utilization.

The Economic Structural Adjustment Programme (ESAP) of 1995-2000 saw the privatization of major state owned enterprises and a more liberalized economy. This saw the Zimbabwe Dairy Board privatized and many more milk processors throughout the country competing with DZL. The low volumes of milk intake have raised production, processing and marketing costs (overheads). Milk and dairy products become expensive as high production costs are passed on to the consumer. Consumption of milk and dairy products has declined because products are unavailable and too expensive. Local dairy products fail to compete with foreign products, which may result in cheaper imports replacing local products. Trade agreements allow free trade in the SADC and COMESA blocks and it is therefore important to establish the problems and government to act swiftly to protect the Zimbabwean dairy industry by preventing cheap imports, but still meeting consumer needs.

1.4 Conceptual framework.

The research framework revolves around the theories of value chain management, marketing strategies, producers' organizations and the inclusion of small scale farmers in formal milk chains and building sustainable relationships.

Animal production systems can be classified progressively, from pastoral systems, through agro-pastoral, mixed farming, smallholder, peri-urban systems to eventually, commercial farming systems. Agro-pastoral systems may be characterized by the commencement of off-farm sales of produce and the establishment of feed resources on the farm. These progress after some time, to commercial farming where the emphasis is on large-scale production techniques, observing of careful standards of safety and hygiene, and eventually exports markets. Walsh. (2007).

A supply chain is defined by Royal Tropical Institute (KIT and IIRR 2006) as a set of linkages between actors where there is no binding or sought after formal or informal. While (Olim 2003) defines supply chain as a set of sequential, vertically organized transaction representing successive stages of value creation. And (Vorst 2007), gives his own definition of a supply chain as activities connected to materials and information flow of money and property right that crosses organizational boundaries, Supply chain not only includes the chain actors which are the input supplier, producer, processor trader and consumer but also depend on logistics flow and transportation of goods and materials.

A value chain is a specific type of a supply chain, one where actors actively seek to support each other so that they can increase their efficiency and competitiveness. They invest in time, effort and money and build relationships with each other actors to reach a common goal of satisfying consumer needs so that they can increase profits, (KIT and IIRR 2008)

A value chain depicts the many activities involved in getting products from the producer to the consumer (Bijman and Ton 2008). These activities occur in a sequence and are carried out by different participants, including farmers, traders, processors and retailers. Each link in the chain adds value to the product. Value chain analysis in a narrow sense focuses on the primary activities in the chain such as production, transportation, processing marketing and information exchange value chain analysis in a broader sense encompasses the rules of the game i.e. chain governance as well as support services such as quality certification.

According to (Vermeulen et al 2008) in the project of regoverning markets, a multi stakeholder process is recommended because in today's complex and highly interconnected world, innovation and change require different stakeholders to work together. Collaboration is required among policy-makers, researchers and practitioners; across different industry sectors; and among government, business and civil society actors.

Stakeholders can be categorised as; **Chain actors** are those involved in producing, processing, trading and consuming a particular agricultural product and own the product at one level of the chain. **Chain supporters** provide services but do not take risks and **Chain influencers** influence the business environment.

The multi stakeholder process is a step by step method involving the following steps:

1. **Mapping out the value chain** and identifying the main actors and the flows of products, money and information. It will often be important to understand where along the chain most value is created and how profit is made by different actors.
2. **Mapping key policies and institutions** that influence the functioning of the value chain and the inclusion or exclusion of small-scale producers.
3. **Establishing the key drivers, trends and issues** affecting the value chain and its actors. Drivers are the main external factors influencing change; trends are the directions of change in the chain, such as types of producers, prices or marketing channels. The issues are the positive or negative implications of the trends for the different actors in the chain.
4. **Exploring future scenarios** in relation to uncertainties about drivers and trends and understanding the future implications for the value chain, its actors and the inclusion of small-scale producers.
5. **Identifying the options for better inclusion** of small-scale producers.
6. **Developing strategies for supporting change** of policies and institutions within the public, private and civil society sectors

Institutions and policies: Markets only work because of institutions (Vermeulen et al 2008). They are the implicitly and explicitly agreed ways of interacting ("rules of the game") that govern individual and collective behaviour at different scales and marketing channels can either be formal or informal. **Formal milk marketing:** involves the channel through which the farmer delivers milk directly to the milk processing plant or to a milk collecting centre or to traders who buy milk from the farmer and sell it to the milk collecting centre or processor. Retailers have the task of supplying the products that are mainly demanded by the market and can influence what processors produce. **Informal milk marketing:** involves the direct delivery of fresh milk by the farmer to consumers or may pass through two or more milk vendors before reaching the consumer; this is typical of traditional markets. Consumers develop relationships with traders and they supply products according to consumers' taste and preferences.

Advantages and disadvantages of formal and informal milk marketing (Cousin 2005)

	Advantage	Disadvantage
Formal milk chain	<ul style="list-style-type: none"> – Easy access and assurance of the market – Farmers are more organized and have more responsibility – Easy access to inputs and services (e.g. training) – With good management of cooperatives payments are Regular – Milk quality assurance involves a cold chain. 	<ul style="list-style-type: none"> – Low profit for farmer – Little benefit from adding value so economies of scale apply. – High investment costs for processors to set up milk factories. – Pricing system not transparent.
Informal milk chain	<ul style="list-style-type: none"> – High farm gate prices for farmer – Sometimes there is direct contact with consumer and they get products cheaper giving a win-win situation for the farmer and consumer. – Simple decision making by farmers – Trust building among actors – Low investment costs – Employment for traders – High consumer demand because of low price 	<ul style="list-style-type: none"> – Adhoc spot markets have risk for farmers and traders as well. – Dependence on trust among actors not contract and can be unreliable when there is an oversupply of milk. – No transparency in pricing – Loss of milk when imbalance demand/supply – Exploitation by middleman in times of surplus (unreliable payments) – No quality control and traceability of products. – High risks with food safety

1.5 Objective of the study

1.5.1 Objective of this research is

To contribute to the reviving of the dairy industry by identifying challenges faced in both the formal and informal milk chains that will be instrumental in improving policy framework for the dairy sector.

1.5.2 Main research questions and sub questions

Q1: What factors have contributed to the decline in raw milk supply to the processors?

What are the benefits of the informal market?

How much milk is produced at farm and of that how much is sold to the processors? (Formal chain)

How much is sold through alternative channels? (Informal chain)

Q2: What strategies can be employed to improve milk supply to the formal chain?

How can milk supply be improved?

What can be done to improve milk safety?

What are the benefits of formalising the informal raw milk chain?

1.6 Study area

The study area Seke district is adjacent to the capital city Harare with a population of over three and half million (CSO 2008) and the dormitory town of Chitungwiza is in Seke district. The effects of liquid milk shortages can easily be noticed. It is in Harare were most displaced by the political violence in the rural areas fled and slums and squatter camps are common in the western and southern high density suburbs, where milk is being sold on open markets. The biggest dairy processing plant is also in Harare and it would be interesting to find out if they are able to meet demand of liquid milk.

Seke district has the four farming sectors hence representative of the farming sectors in Zimbabwe i.e.

- LSCFA: are commercial farms of Beatrice farm size big. By the new land tenure the land ownership is with the state but previously they were on leasehold and most farmers had title deeds.
- SSCFA: small scale farms of Marirangwe and Muda; former purchase areas were experienced farmer were settled in the 1950's. Some farmers had obtained title deeds.
- Resettlement areas: beneficiaries of land reform have been settled and land is on 99 year leasehold. Old resettlement schemes have 6ha and communal grazing, A1 schemes have up to 20ha and A2 farmers have more than 20 ha.
- Seke communal area is state land and plots allocated by chiefs some up to 2,5ha.

Chapter 2: Methodology

2.1 Desk study

Desk study to establish the status of the dairy industry in Zimbabwe and a literature review to see how other countries have developed their dairy industries and what lesson can be drawn from the cases was carried out. Countries that were looked at are Kenya, Ireland, Uganda and India.

2.2 A case study

A case study to establish raw milk formal chain was conducted, the processor selected Dairibord Zimbabwe Limited (DZL) .the Milk Supply unit for DZL gave an account of their operations and the Business Development unit responded to the questions on the checklist. Information generated include their milk intake, challenges they are facing and how they are coping, their marketing strategy as well as scope for the company's growth.

2.3 Observations

Observation on the morning and evening market checked on the *milk vendors*, at Chikwanha and Chitubu open markets in the high density suburbs.

2.4 Survey

A questionnaire for producers was administered; a sample of 44 farmers was randomly selected from Seke District according to farming sector. The four sectors are communal, resettlement, small scale and commercial farms.

The extension staff and MCC management were not allowed to participate so as to maintain confidentiality. The survey was aimed at generating data on

- Distribution of cattle in the different farming sectors, what breeds and how much milk is produced across the sectors.
- Who is actually supplying this informal chain? Why the farmers are shifting to the informal chain? Are there any benefits they get?
- What problems the producers facing that compel them to sell to the informal chain?
- Are producers getting any extension support and who provides the services?
- Are milk dealers registered and certified according to the Zimbabwe legislation, and do farmers have any binding contracts or employment elsewhere?

2.5 Triangulation

Of facts collected with supermarkets, milk testing laboratory, CSO and DHI. Triangulations were done to examine the information gathered from three or more angles in order to get a general understanding of the situation in order to make a better analysis (Verschuren and Doorewaard 2005).

2.6 Data analysis

- PEST analysis for the dairy sector
- Porter's 5 forces for the processors
- Value share of the formal and informal chain.
- Cross tabulation was used to explore the relationship contributing to side marketing

2.7 Limitations of the study

Farmers were very sensitive about side marketing and it was difficult to get figures of volumes side marketed; since this is against their constitution.

The sample size was small due to the limited time for data collection and could not perform some tests.

Chapter 3: Background information

3.1 The overview of the livestock sector in Zimbabwe

Livestock plays a crucial role in the Zimbabwean society by providing food security, income, draft power, manure and other by-products, saving, social and cultural relations, self-esteem, wealth and foreign currency earnings from exports. The cattle for commercial sector is clearly distinguished into beef and dairy while the small scale sector does not specify the economic purpose of the cattle which have several uses at household level although the small scale sector has more cattle than the commercial sector as shown in table 1 below.

Table 1: Livestock numbers (in thousands) in commercial, communal and resettlement farming sectors

Year	Commercial sector		Communal + Resettlement sectors			
	Beef	Dairy	Cattle	Goats	Sheep	Pigs
1980	2304	106	2869	1108	307	86
1981	2287	104	2895	1375	396	124
1982	2298	102	3262	1014	354	135
1983	2253	105	3189	1178	352	133
1984	2120	111	3234	1609	348	159
1985	1979	111	3409	1711	422	152
1986	2014	112	3657	1916	343	191
1987	1892	121	3905	2210	447	192
1988	1884	121	3815	2360	545	226
1989	1867	123	3856	2419	517	275
1990	1704	127	4172	2621	588	233
1991	1714	126	3509	2622	487	207
1992	1641	124	4259	2618	491	209
1993	1451	115	3589	2569	456	204
1994	1383	105	4279	2556	461	201
1995	1331	105	3381	2457	466	157

Source: (Gambiza and Nyama 2000)

Most commercial beef farmers do not milk their cows and milk is drawn from the dairy herds unlike in the small scale sector the cattle are dual purpose and milked. Beef herds are kept extensively on pastures while dairying is more intensive and cows are fed with concentrates that are bought in or mixed on farm. On the other hand small scale farmers mainly graze their cattle which are mainly indigenous; cows have a shorter lactation period (90-150 days) and daily milk yields are 2-3litres /cow/ day depending on the season (Mupunga and Dube 1985). Grazing quality affects milk yield since the CP cannot meet the cows' requirements for both maintenance and production especially in May as shown in table 2 below. This implies that a lot of supplementary feeding is needed for milk production to be spread in all seasons.

Table 2: Seasonal changes in dry matter (DM), crude protein (CP), crude fibre (CF), ash and total digestible nutrients (TDN) of ungrazed rangeland on clayey soils at Henderson Research Station (Natural Region II)

Month	DM (kg ha ⁻¹)	CP (g kg ⁻¹)	CF (g kg ⁻¹)	Ash (g kg ⁻¹)	TDN (g kg ⁻¹)
November	539.9	87	307	109	-
December	1080.9	70	316	102	612
January	1555.8	52	356	100	523
February	2441.1	43	369	97	529
March	2921.9	36	381	89	473
April	2919.6	31	388	98	438
May	2868.4	28	406	90	293

(Source: Elliot and Folkertsen, 1961)

Most of Seke district lies in natural regions IIa and IIb which according to (Vincent and Thomas, 1960) is an intensive cropping area and is suitable for dairying. The crop residues if well preserved can be useful for dry season feeding to sustain the milking cows. As shown in table 3 below 93% of the area lie in natural regions IIa and IIb and only 7% in region III and this implies the district has high potential for intensive farming. If farmers in resettlement are supported they can be equally productive as commercial farmers.

Table 3: Farming sector by agro-ecological regions for Seke District

Land category		Natural regions				totals
		IIa (ha)	IIb (ha)	III (ha)	IV (ha)	
Communal	Seke	36 808				36808
LSCFA	Beatrice	23 221	92 882			116 103
	Harare South	19 241	38 483			57 742
	Sub total	42 462	131 365			173 827
Resettlement	Beatrice		18 065	18065		36 310
	Harare South		1 288			1 288
	Sub total	0	19 533	18065		37 598
SSCFA	Marirangwe	5 800	997			6 797
	Muda		5 156			5 156
	Sub total	5 800	61153			11 953
Total		6 1 849	87 390	18 065	0	260 186

Source: MoA

3.2 The dairy sub-sector

The dairy industry of Zimbabwe comprises all stake holders from input suppliers, milk producers, processors, transporters and other service providers but excludes the informal chain players. Zimbabwe dairy industry has been developed over the years and even small holder dairy development projects have promoted formal milk marketing that meets the Zimbabwean regulations that are in line with international food-quality-assurance standards. The informal milk markets have not been given much attention and milk sold by most communal and resettlement farmers are not accounted for especially where there is no small holder dairy project. Country wide there are only 35 registered smallholder dairy projects leaving out the majority of farmers that produce milk although at a relatively smaller scale.

3.2.1 Milk production and marketing

According to the Dairy Act of Zimbabwe (1977) which regulates the dairy industry milk producers have to be registered and certified by the Dairy Services a unit within the DLPD. The Chief Dairy Officer issues a certificate that has to be renewed annually after an inspection. It is from these registered producers that the Dairy Officer gets production statistics of what has been delivered to processors and what producer retailers sell on farm (see table below for the registration types). A record of farmers who and how milk storage and collection is done but the unit has so many outstanding inspections to be done according to the Dairy Services Regulatory report.

The Dairy Services keep milk production records, while the CSO are mainly looking at livestock census. From the census they conduct in terms of the census and statistics act chapter 10:05 the March 2003 livestock and employment return only number of the different livestock classes on no account of how much milk is produced at farm level.

Table 4: Registered milk dealers

	Mashonaland		Gweru		Kadoma		Bulawayo		*Chipinge		*Mutare		Total		
	April 2009	May 2009	April 2009	May 2009	April 2009	May 2009	April 2009	May 2009	April 2009	May 2009	April 2009	May 2009	April 2009	May 2009	May 2008
No. of registered producer wholesalers	80	80	49	49	7	7	35	35	17	17	19	19	207	207	212
No. of registered producer retailers	12	12	2	2	2	2	3	3	0	0	2	2	21	21	21
No. of producer retailer-processors	20	20	3	3	3	3	4	4	0	0	4	4	34	34	34
No. of producers who ceased	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Number of new producers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Number of registered producers	112	112	54	54	12	12	42	42	17	17	25	25	262	262	267
No. of producers on cans	8	8	9	9	0	14	14	14	0	0	5	5	36	36	38
No. of producers on bulk	72	72	40	40	7	7	21	21	17	17	14	14	171	171	174
No. of processors	5	5	2	2	1	1	2	2	1	1	1	1	12	12	12

Source: Dairy services regulatory report May 2009

3.2.2 Farming sectors

There are four main farming sectors in Zimbabwe: communal, resettlement, small scale, and commercial farms. The changes have seen more small scale farmers who have many enterprises on the same farm and dairy is a side enterprise. With the change in farming system the focus in the extension has been farmer training on good farming practice and fodder production. Despite the skills and knowledge small scale farmers' milk production continues to decline and processors are facing the challenge of capacity under-utilization, and for projects already processing they cannot get enough milk to utilise their capacity.

Table 5: Farming sectors for Seke district

Farming sector	Number of planned plots
LSSFAs	35
SSCFAs	306
Communal	10 649
Old resettlement	1074
A1	2 596
A2	201

Source: Seke District Agritex office

3.3 Impact of the external environment on the development of the dairy industry:

The external environment encompasses the factors that do not directly make decisions for the dairy industry but influence the operation of the chain. PEST is used to describe the general environment in Zimbabwe and its impact on dairy development.

Political

Land tenure and security of tenure has made many farmers reluctant to invest and expand their operations, since they do not know for how long they will be on the farms. Milk quantity as well as quality has significantly declined.

Experienced farmers replaced by new crop of inexperienced farmers during land reform.

Population growth in urban areas has boomed because political violence in rural areas, droughts made farming business not lucrative and most able bodied have migrated to cities to look for a job or join the informal sector. This has created squatter camps; slums and high population density for the locations and this population is into milk vending they buy milk from nearby farms naturally ferment it then sell on open markets that have mushroomed in the high density suburbs. This low income group from the slums are the customers for the milk sold on the open markets.

Political instability is a threat to investment but with the formation of the GNU (Government of National Unity) price controls have been removed and milk price is determined by market forces of supply and demand. Farmer sell their milk to the processors who offer better prices and better terms like paying for transport.

Outdated laws and policies governing livestock production

Economic

Macroeconomic uncertainties e.g. fluctuations in exchange rates; high debt service cost; high cost of inputs and high inflation also affects input prices. Numerous direct and indirect taxation on agricultural produce, and companies find it difficult to bring in new equipment or buy spares because of tariffs.

Bigger processors like DZL have automated their production flow ,ESAP and liberalization saw the privatization of the Dairy marketing Board in 1995 and new entrants into milk processing are being registered small but many new comers. Unemployment for Zimbabwe is over 80%. For June 2009 the monthly basket was \$437,62 and 90% of the population live below the poverty datum line. Government Gazette, July 2009.

Low incomes constraints limit overall consumption of dairy products and influence the amount of dairy products consumers obtain from the formal and informal markets. Per capita consumption of milk has declined from 27 litres in 1995 to 6 litres in 2007; (CSO 2008)

Social

Low income groups demand for cheaper naturally fermented milk which they take with sadza the staple food.

No farm labour is influencing low production. Most people are going gold panning.

Rural urban migration young people gone to city to find a job, so farms are run by old people.

Technological

Milking machines and forage equipment are expensive and not affordable for the new farmers, also scale of production does not need the big machines which are available on the market.

Milk cooling is difficult in areas without electricity and quality is adversely affected. Even for electrified areas the power cuts are affecting the milking process and most farmers use generators which has raised production costs. This has prompted other farmers to resort to hand milking which so difficult for large herds and the prevailing labour shortages on farms.

The poor road network makes milk collection more difficult in the widely spaced farmers making transport cost so high. NDC has stopped collecting milk for most routes and farmers have to take the milk to processors using own transport.

Low producing breeds being milked usually from the beef herd.

Water availability is an issue for most small scale farmers, they cannot afford to sink boreholes and later alone establish irrigation for pastures and fodder production. Most small scale farmers are in drier regions and rely on crop residues to feed their cows in the dry season. Thus milk production for the small scale farmers is seasonal with a flush in summer and low production in the dry winter months.

Effect of Globalization

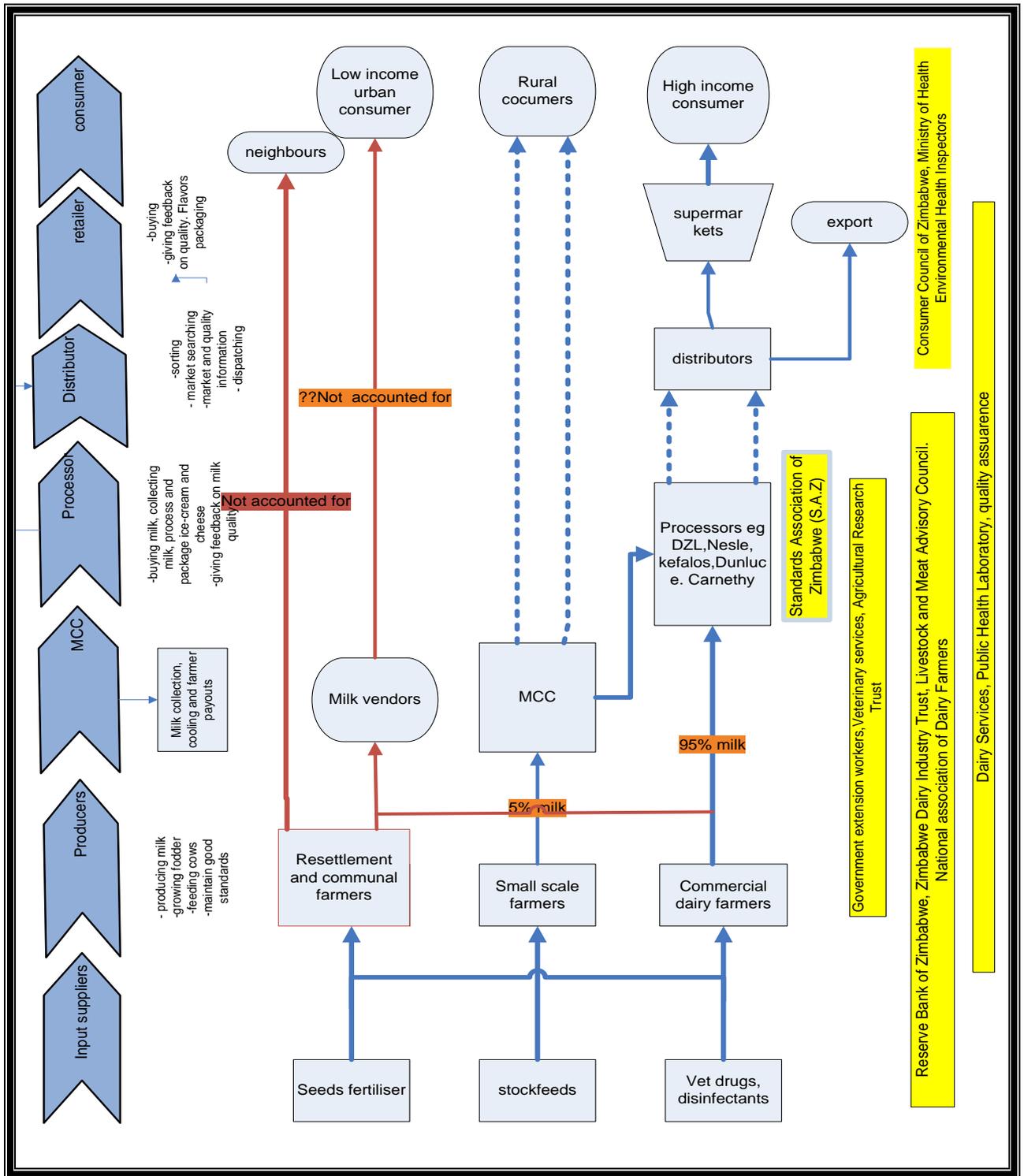
Processors are exporting their products within the SADC and COMESA regions and they find products demanded for export e.g. cheese more competitive than producing liquid milk which is demanded most by local consumers. Most milk is processed into high value products and has created a shortage of liquid milk that has forced retailers to import liquid milk to meet their customers' needs.

Milk imports from SADC poses a threat of cheap imports and this will force farmers out of production, local milk will be more expensive and consumers will go for the cheap imported brands.

Disease outbreaks like FMD affect exports of milk products,

3.4 Raw milk supply chains for Seke district

Seke district comprises communal, resettlement, small scale farms and commercial farms and can all these farming systems be part of a milk supply chain, especially in the communal and resettlement areas which are mainly subsistence farming areas? (KIT and IIRR 2008) agrees that subsistence farmers are part of a supply chain even in the most remote areas since the farmers are connected to markets, selling small amounts to local village markets or to traders who come to buy from farmers in the village. The chain may be very short and the question is how they can improve their performance by improving quality and volume of output.



Function chain actors

supporters and influence

Figure 4: Raw milk supply chains for Seke District

3.5 Stakeholder analysis

Stakeholder	Roles	Challenges
National Association of Dairy Farmers (NADF)	Producer organization for commercial dairy farmers. Provide training and extension, veterinary services to members.	Membership has declined and continued political instability in land reforms
Small Holder Dairy Farmers' Association of Zimbabwe	Producer organization for smallholder dairy projects. Sourcing funding for projects.	35 registered projects whose members are struggling to sustain their production
Zimbabwe Dairy Industry Trust	To foster understanding and good will among stakeholders with a view to facilitate information dissemination about aspects of dairy. Guided by the ZIDT Notarial Deed of Trust	Supported by milk levies collected by processors and as little milk comes forth the funding has dwindled
Processors eg Dairy Board Zimbabwe Ltd; Nestle, Kefalos	Processing, packaging and distribution of dairy products Contracting producers Providing extension support Guarantors for loans	Low milk supply and capacity under-utilization
Input suppliers	Supply of stock feeds, veterinary drugs, medicines, detergents and disinfectants;	High input costs, low demand for products is making products expensive
Ministry of Agriculture	provides veterinary services, extension services and milk regulatory services ,import and export permits	Brain drain, high farmer to extension worker ratio; limited resources
National Dairy Cooperative	-milk collection and transporter; -supplies the bulk tanks for cooling milk - collect milk to the processors, -they also take samples of milk to the laboratory for testing, - they deliver milk for farmers as they collect milk.	Some routes have become non viable as farmers cannot meet the high transport costs. Bulk tanks are inappropriate for small herds Road networks are poorly maintained and cost for running fleet has become excessive

Chapter 4: Findings

4.1 Literature review on raw milk chains

4.1.1 Kenya

According to International Livestock Research Institute (ILRI)2009 traditional milk markets supply over 80% of marketed milk in Kenya. The same smallholder dominance is seen in other countries of the South, such as Tanzania (98%), Nicaragua (86%) and India (83%), now the largest dairy producer in the world.

According to DFID & ILRI research of 2006 Kenya's economic reforms in 1992, the share for marketed milk in 1995 was Hawkers 3%; 24% Co-ops.; Kenya Cooperative Creameries 34% ;24% Co-ops and Self Help Groups; and 39% Farmers. Post reforms in 1997 milk share changed to Kenya Cooperative Creameries 3%; 5%Processors; 15%Hawkers; 23% Co-ops. + Self Help Groups 54%

Farmers this Kenyan case before and after the reforms shows increase in farmer participation in milk marketing, which can be a pro-poor strategy for poverty alleviation; although most milk now passes through the informal market. Informal markets sell cheaper milk for poor consumers, satisfy traditional tastes and offer better prices for milk producers.

4.1.2 Uganda's Dairy Industry

Uganda's informal market sector serves as a conduit for about 85 percent of the milk marketed in the country. The formal sector, which includes conventional milk processing, handles about 15 percent of the milk. Approximately 30 percent of the milk produced in Uganda is consumed on farms. (Dodson and Combs 2005)

Traditional cattle, mostly Ankole, make up about 85 percent of the cattle herd. These cattle produce only one to two litres of milk per day. Higher producing mixed breeds and commercial herds make up the remaining 15 percent of the herd. According to the Twinamasiko the executive director of the Dairy Development Authority of Uganda the daily milk production is 3 million litres yet the available processing capacity is about 560,000 litres per day; i.e. five times more milk than processors can handle, as reported in the *East African Business Week of 29th May 2009*.

4.1.3 India

India launched Operation Flood in the 1970's with assistance from World Bank, which assisted milk producers' cooperatives; Cooperatives procured milk, provided inputs and services, making modern management technology available to members.(World Bank Report 1997c.) The programme aimed to Increase milk production ("a flood of milk"), augment rural incomes and reasonable prices for consumers. The bedrock of Operation Flood has been village milk producers' cooperatives, which procure milk and provide inputs and services, making modern management and technology available to members

In Maharashtra the state ranked sixth in milk production in the country (about 7 percent of the national milk production) during 2004-05.(see table 1 below) of the milk sold by rural producers flowing into urban areas 70 % of the came through traditional (informal) markets

and the remaining 30% through cooperatives and private organised (formal) markets. (Maarse, 2009)

Striking is that India accounts for its rural milk production and the projected turn around for the traditional milk markets by involving private sector.

Table 6: Milk utilization and marketing pattern in India

MILK PRODUCTION				
Estimated demand by 2021-2022				
Milk utilization & Marketing patters: current versus projected scenario				
Milk utilization & Marketing patters	Current scenario		Projected scenario	
	2004-05		2021-22	
	Mio tons/per year	%	Mio tones/per year	%
Annual RURAL MILK production	83		155	
Milk consumed/used in villages itself	40	48%	74	48%
Milk sold by rural producers - flowing into urban areas	43	52%	80	52%
Milk utilization & Marketing patters:				
1. Unorganised (traditional milk marketing)	30	70%	13	30%
2. Cooperatives & New Generation Cooperatives	7	16%	17	40%
3. Private organised	6	14%	13	30%

Source: Maarse, 2009.

4.1.4 Ireland

In the mid -1950's, the dairying industry in Ireland stagnated as the nation recovered from the Second World War restrictions and food rationing. Until then, the emphasis had been on national self-sufficiency of dairy products and most farmers had less than 10 cows, production being mainly for household use. The average number of cows per supplier of milk to creameries was 6.9 in 1961, 8.1 in 1966 and 10.7 in 1971. The average is now 50 cows. (Walsh 2007)

The major turn-around occurred in the 1960's with the publication of new national strategies for economic progress that prioritized economic growth based on the agricultural sector. The EEC Common Agricultural Policy (CAP) set up in 1957 aimed to guarantee food security in post war Europe at stable and reasonable prices to producers by maximizing production and protecting domestic agriculture from foreign competitors. The dairy policy regime has been one of the main structures of the Common Agricultural Policy since the creation of the European Community. (Hennesy 2003)

Signing up to the GATT Uruguay Round agreement in 1994 was a real watershed in policy evolution as it meant that EU agricultural policy was now firmly within a framework of multilateral rules rather than unilaterally deciding its own policy instruments. In Ireland, dairying is the most profitable of all the main farming enterprises. Its profitability is heavily influenced by policies which are devised at EU level to regulate the industry. The EU dairy industry is currently managed by a supply control mechanism commonly known as the “quota regime” and a market price support system of import tariffs, intervention purchasing and subsidized export and internal disposal of dairy products. (Donnellan 2001) Currently a high proportion of Irish dairy farms are not economically viable. To continue in farming a large number of farm households may have to look for alternative strategies e.g. extensification, diversification or off-farm employment. The future of milk quotas is one of the most contentious policy issues currently being debated in Irish dairy circle

4.2 Situational analysis of task environment for processors using Porter’s 5 forces

Porter’s five forces are a tool used to analyze the task/ specific environment. ; Buyer’s bargaining power; threat of substitutes; barriers to entry and rivalry of competitors. These forces are market based and look at supplier’s bargaining power.

Supplier power: The milk processing industry requires raw milk, labour, packaging and other inputs. This requirement leads to buyer-supplier relationships between the industry and the dairy farmers that provide it the raw milk used to manufacture products.

Dairy farmers with large herds have forward integrated they now do both processing and distribution of milk on the farms and no longer supply the traditional milk processors who are now operating way below their capacity.

Seke district has 35 dairy farms and are concentrated so once one farmer begins processing they supply the new processor with the milk and they have no binding contracts with the traditional processors; and there are no costs in switch who to supply the milk. Transport costs are also reduced if they supply their milk to their neighbours rather than travel all the way to Harare. Producers also share information on the market and this has seen DZL losing its traditional milk suppliers.

Milk producers have become powerful they have boycotted to supply DZL milk and have found alternative buyers for their milk, after DZL was not paying for transport. The farm processing is cheaper in terms of labour, rentals, and water bills and they can afford to collect the milk from the neighbours.

Barriers to entry: The possibilities of new processors that enter industry create competition. The government dairy regulations of 1977 allow free entry into milk processing but set standards that have to be met before registration. Inspection and follow-up is however limited by scarce resources for DLPD’s dairy services unit to do inspections for certification. Milk processors can enter and exit market freely and there is no protection that can inhibit additional rivals from entering market. Access to inputs and finance to invest has been difficult for the sector and processing projects are taking long before they qualify for certification.

Economies of scale/cost advantage: Industries with high minimum efficient scale normally deter entry of small, start-up businesses. But because of the capacity underutilization the large companies are incurring high overhead costs and smaller processors on farms incur lower costs of production and resultantly produce cheaper milk products.

Threat of substitutes: the demand becomes more elastic since customers have more alternatives. Foreign brands of cheaper milk are available in the major supermarkets. Soya milk is a cheaper whitener for tea and coffee and is also being used for making yoghurt.

Processors’ bargaining power:

The change in milk processing regulations saw many new farmers forward integration into processing and distribution and farmers sell their milk to closest processors to cut on transport costs.

Bigger processors purchase a significant proportion of milk and on each collection route get bigger volumes of milk.

Processors have become weak because

- 1) Producers threaten forward integration – producer can take over own distribution/retailing
- 2) Buyers (processors) are fragmented (many, different) and no processor has any particular influence or product or price current dairy regulation allow free entry into processing.

Degree of Rivalry: In pursuing advantages over rivals, the processors choose from several competitive moves: Information exchange between stakeholders is important between supply chain actors. Market information encompasses timely and accurate prices, buyer contacts, distribution channels, buyer and producer trends, post harvest handling advice and storage and transport recommendations. Market information keeps farmers and traders attuned to the demands and changing preferences of the consumers, guiding farming, marketing and investing (World Bank 2008)

Changing prices: since the GNU has decontrolled prices the different processors are paying different prices to producers shown in the table below:

Table 7: Milk prices as of July

Processor	Milk price	Transport support
DZL	\$0,35	No
Nestle	\$0,40	yes
Dunluce	\$0,40	yes
Crystal Candy	\$0,55	yes
Carnethy	\$0,40	no
Kefalos	\$0,39	no

Short supply of raw milk makes processors compete for the scarce commodity and processors hide information about their producers and pay more or give incentives to get milk; e.g. paying for transport or paying volume premiums like DZL does see table below. All processors however meet the cost of production cost and most famers break even. See table 6 in annex on cost of production.

Table 8: Premiums on incremental volume

% increase above agreed volume	Bonus	*Bonus/L on Incremental vol.	*Price /Litre on Incremental vol
< 10%	0%	0.00	0.35
10%-20%	5%	0.02	0.37
>20%-30%	10%	0.04	0.39
>30%-40%	15%	0.05	0.40
> 40%	20%	0.07	0.42

*producer price of \$0.35/litre assumed

Adapted from the DZL contract form revised may 2009

Improving product differentiation

DZL has the advantage of having brand names that are almost synonymous with products the small scale processors are also making e.g. lacto the fermented milk is the name consumers give to all fermented milks. For fresh milk DZL is making super milk for the high end consumers while steri milk is for rural consumers without refrigeration facilities.

Kefalos is competing with DZL ice-cream and is selling to vendors who are seen in the locations moving with five litre containers and selling door to door. There is a variety of the Cortina ice-creams that are just \$5 for five litres while Dairibord sells the same volume for \$11. The containers for Kefalos are recycled reducing the packaging costs, most of their customers are vendors or small business that buy and resell to institutions like schools, hospitals and company canteens.

Market Segmentation for DZL

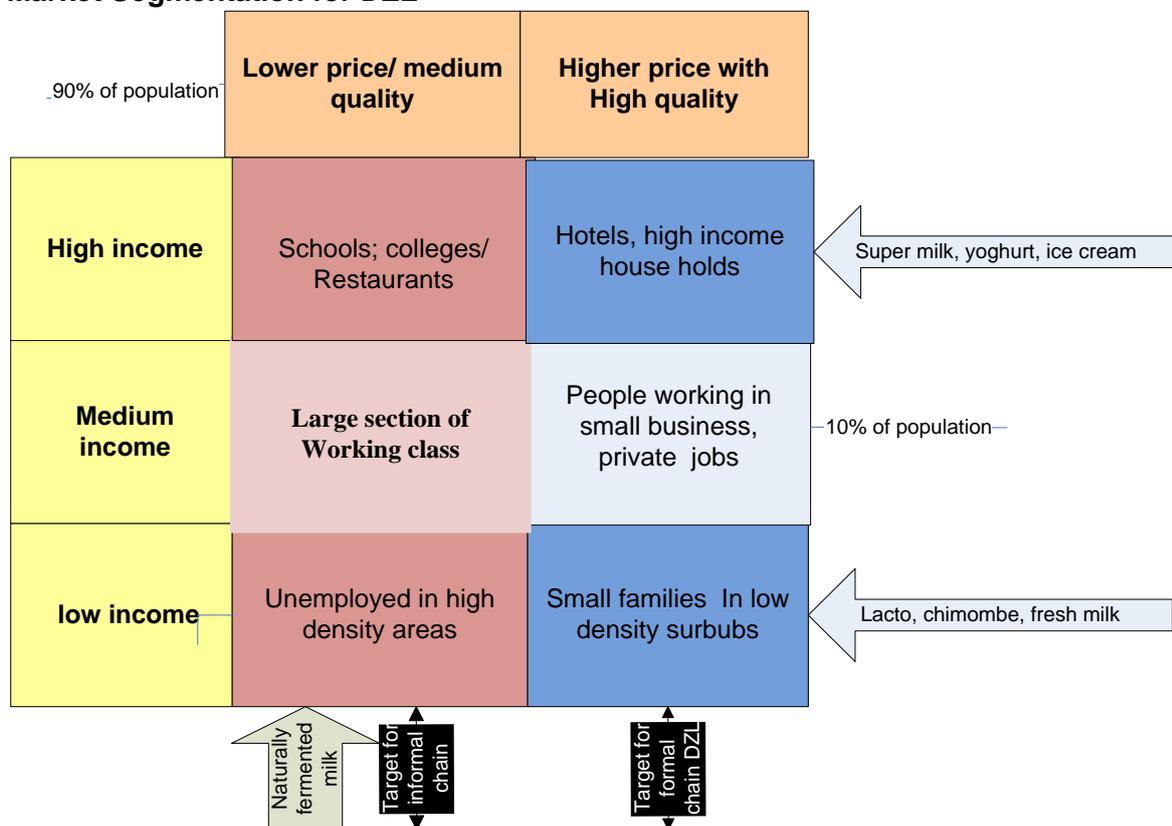


Figure 5: How market has been segmented for the milk products

DZL has segmented its market to target the high end market which is a small segment of the market but gives them high return per litre see table below. This has left the majority of consumers not affording the DZL products and consumers have resorted to the informal chain and buy from vendors, open market or road side kiosks or vendors in public offices. They don't consider important factors like packaging convenience, right label, and product information like sell by date, food safety and traceability. Consumers bring their own containers or the vendors recycle 2 litre and 5 litre juice containers.

Value addition to raw milk.

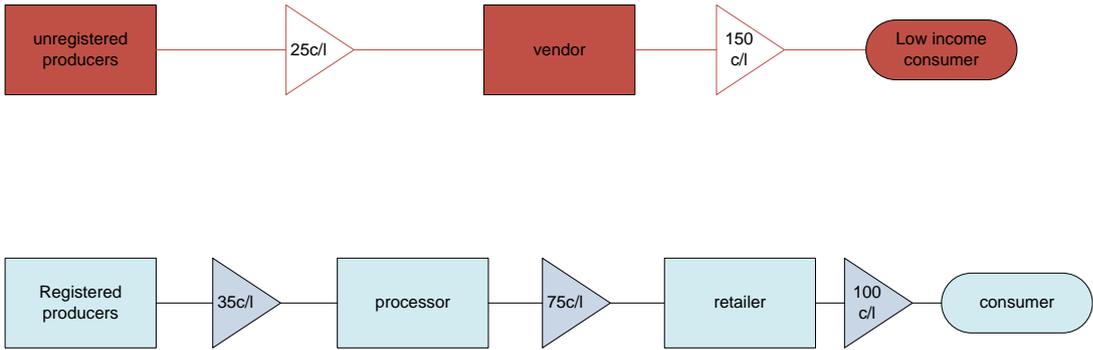


Figure 6: Value addition along milk chain

Table 9: Value shares of actors in the fermented milk in Zimbabwe.

Chain actor	Variable costs	Revenue	Gross income	Added value	Gross margin	Value share
Milk producer	0,30	0,35	0,05	0,35	14%	35%
Processor	0,35	0,75	0,40	0,40	53%	40%
Retailer	0,75	1,00	0,25	0,25	25%	25%
milk producer	0,15	0,25	0,10	0,25	33%	17%
vendor	0,50	1,50	1,00	1,25	67%	83%

Per litre of fermented milk in USD

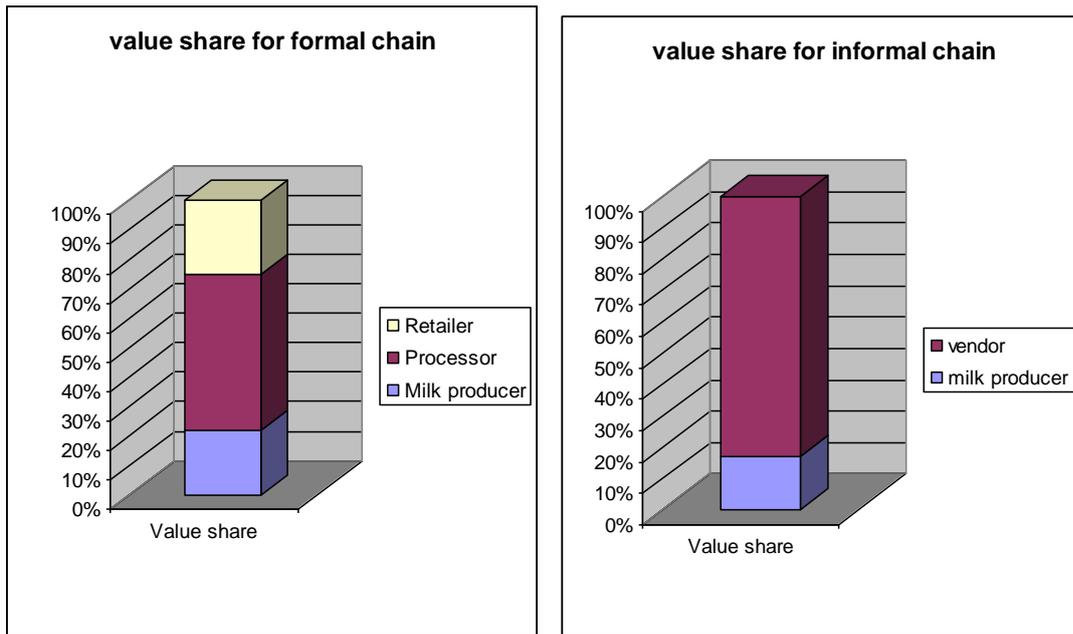


Figure 7: Value share for the formal and informal chain

Vendors travel long distances looking for raw milk which they process milk by leaving it for a day then drain whey out in day two and product will be ready for sale. This milk is sold from 20litre cans and a tea cup is the measure. The price for naturally fermented milk sold by vendors is more per unit than the cultured milk sold by processors. The milk seems cheaper because of the small volumes sold i.e. \$0, 50/ 300ml cup. Processors pasteurise the milk and package the milk and distribute to retailers.

Creatively using channels of distribution (vertical integration)

Most commercial producers have discovered they make better business by diversifying into processing and distribution of their products to selected supermarkets. By exploiting relationship with milk producers; the commercial farmers are supplying their milk to fellow farmers who have gone into processing and DZL is losing most of its producers. Out of the 66 producers supplying Harare dairy only 3 have signed contracts and raising uncertainty on how much milk the processor will continue to receive. The processor is now considering use of milk powder reconstituted and this is a threat to producers.

Chapter 6: Survey results

6.1 Demographic data:

6.1.1 Age:

Of the mean age of farmers is 54, 3 years and the majority of farmers interviewed are old, mainly pensioners and are full time farmers. Taking milk to an MCC each day would be stressful for their age and means of transport mainly cycling.

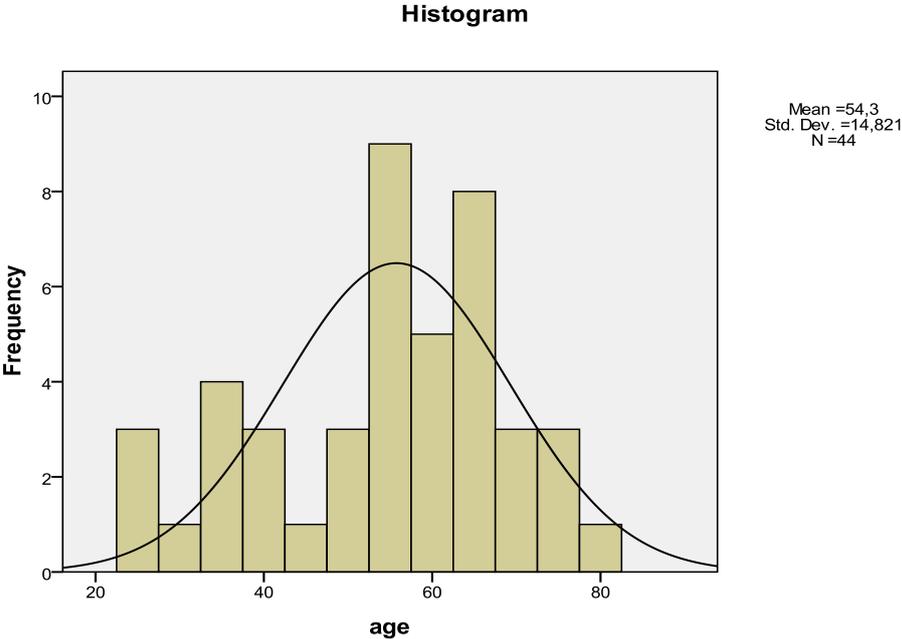


Figure 8: Distribution of age of respondents

6.2 Milk Marketing

6.2.1 Registration

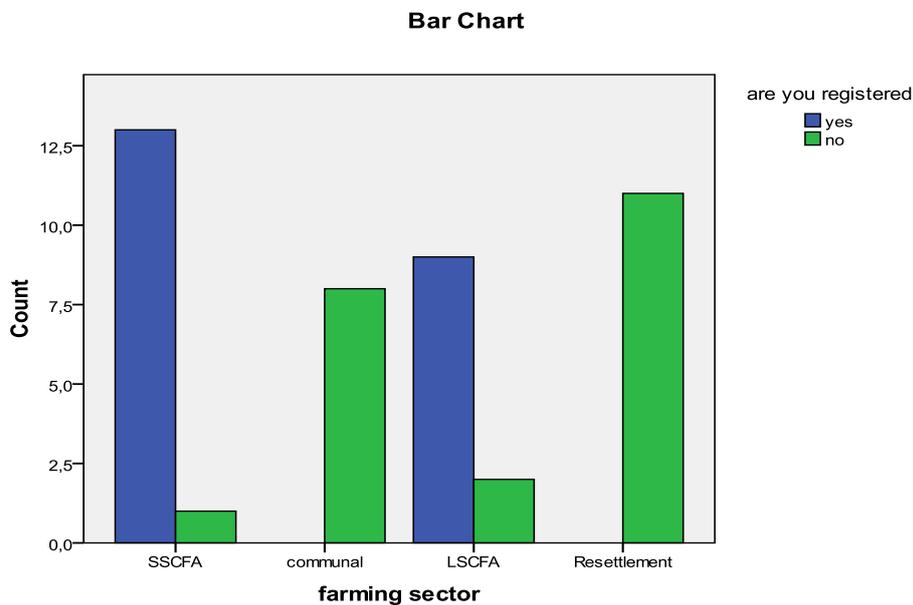


Figure 9: Registration in the different farming sectors

Most respondents in Marirangwe are registered while none is registered in the communal and resettlement sectors; only few commercial farmers are not yet registered. While the majority of unregistered producers do not deliver their milk to processors see fig 6 below some registered producers do not deliver milk to processors and these are side marketing. A Chi-Square Test has proved that there is a significant difference between farmers that are registered and deliver their milk to processors. P value is $>0,001$: see table 2 in annex .

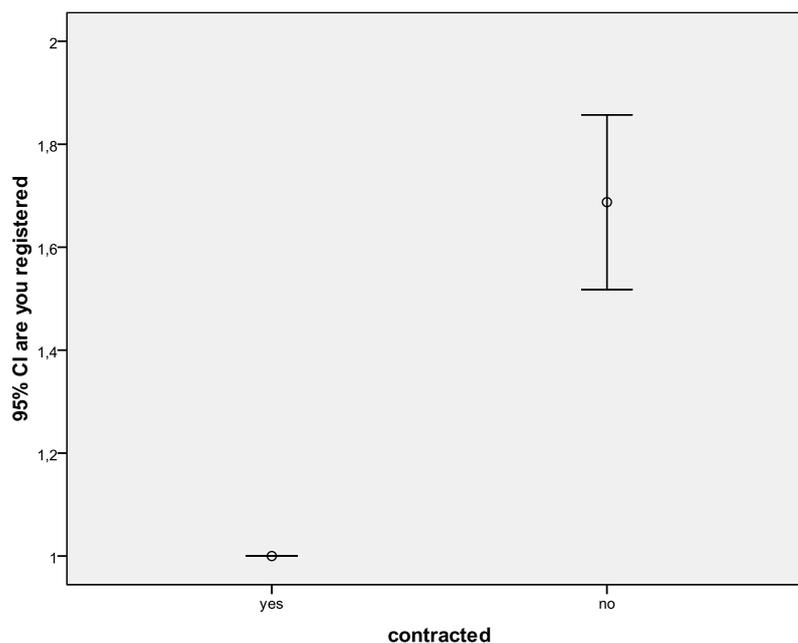


Figure 10: Error bar for contracted and registered

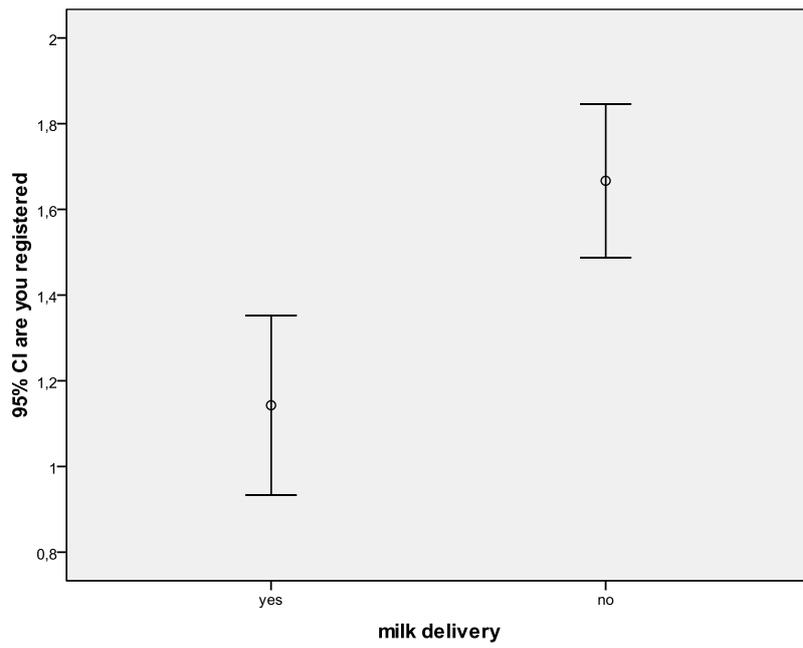
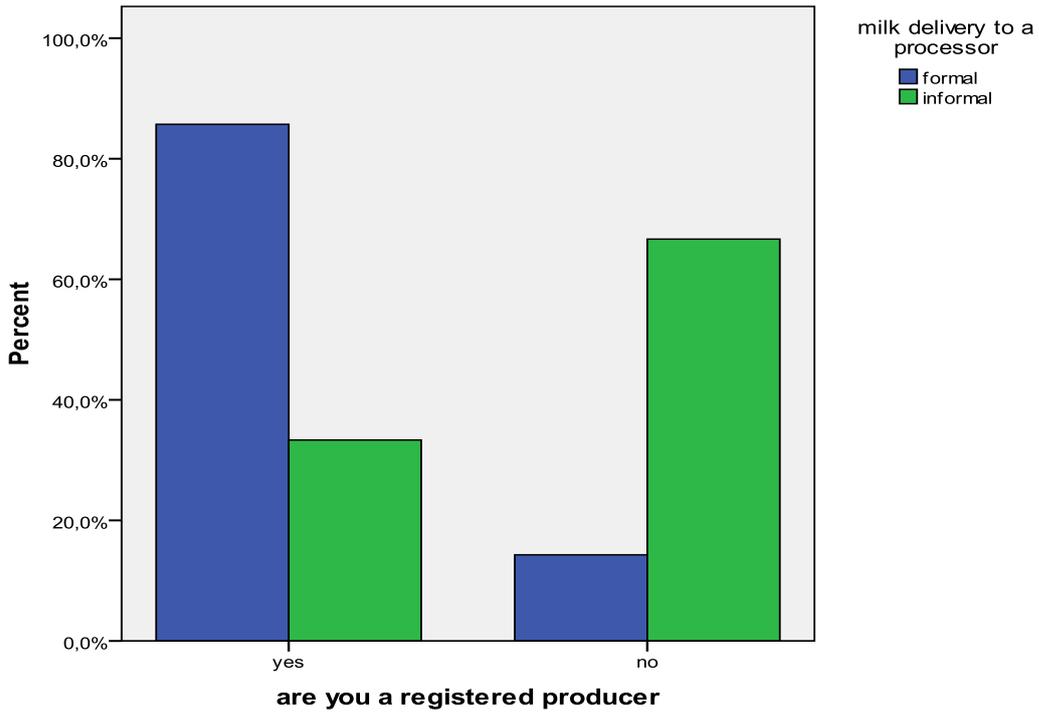


Figure 11: Error bar for whether farmers deliver milk to a processor and are registered



Bar Chart

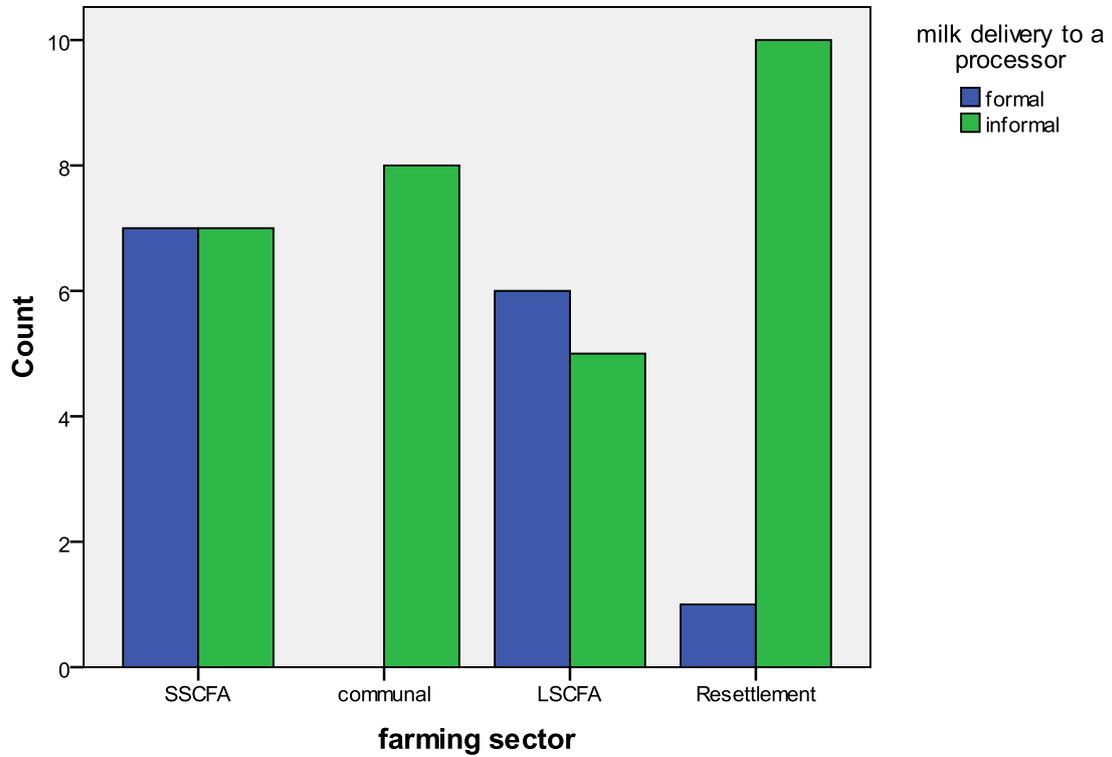


Figure 12: producers selling their milk to the formal and informal chain

6.2.2 Milk marketing channel

Farmers in the resettlement and communal areas are not registered and they all responded that they did not know about it. Most of the farmers not delivering milk to a processor 34% sell to neighbours, 34% to vendors and 6% sell by road side to motorists who are their ready market and 6% take their milk to open markets; shown in figure 10 below. Those who did not respond to the question are the ones supplying milk to a processor.

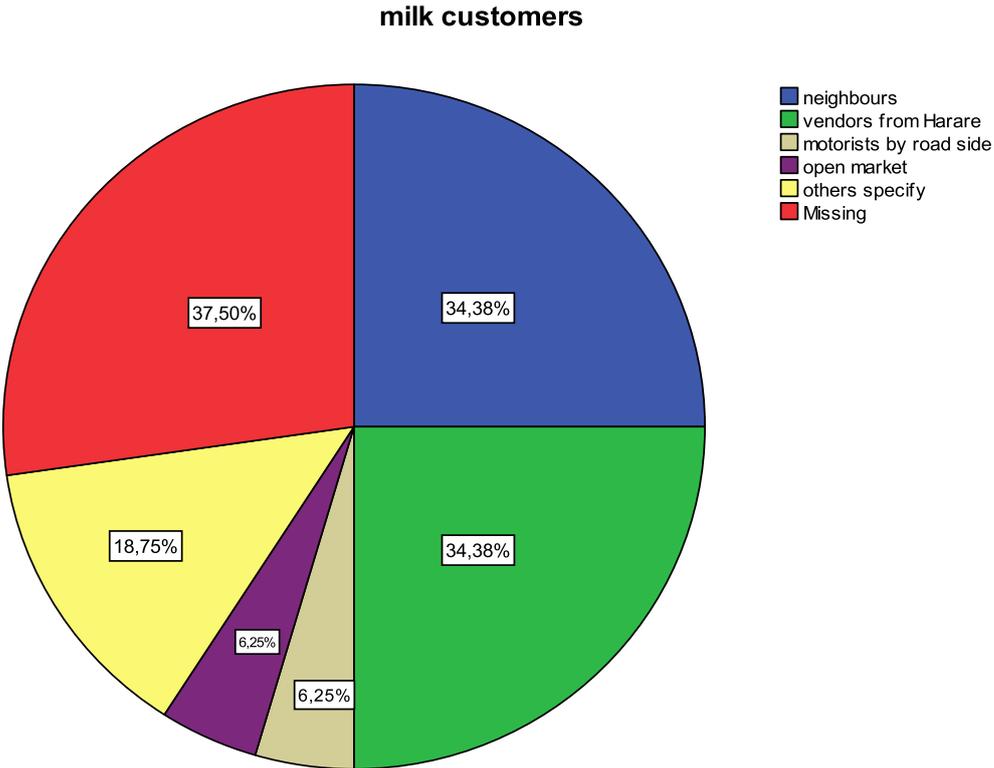


Figure 13: Who do producers sell their milk to?

Respondents indicated their choice of a consumer as reflected by the bar chart below. Majority of sighting better payment terms, only available market and low volumes as the factors influencing who to sell their milk to. Distance to the market, transport convenience and higher prices were ranked lower.

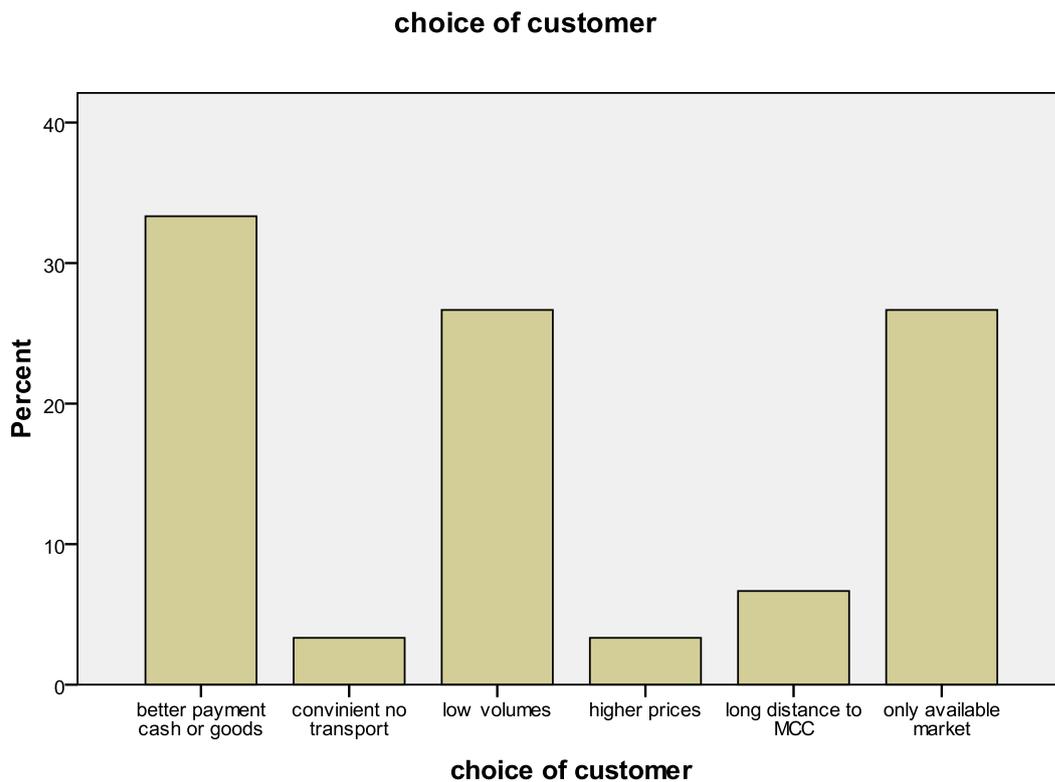


Figure 14: What influences choice of customer for raw milk

Transport

NDC is the traditional bulk milk collection company, which offered bulk tanks on a rental basis to commercial farmers and provides repair and maintenance of the tanks. Its service has declined for the sample only 2,3% respondents use NDC transport. Its transport system is now open to other customer e.g. they are supplying water under sanitation projects by UNISEF where they get better rates for their service and only operate in urban areas where roads are better than farm roads. 29,5% of the sample sell milk to those customers that come to their farm.

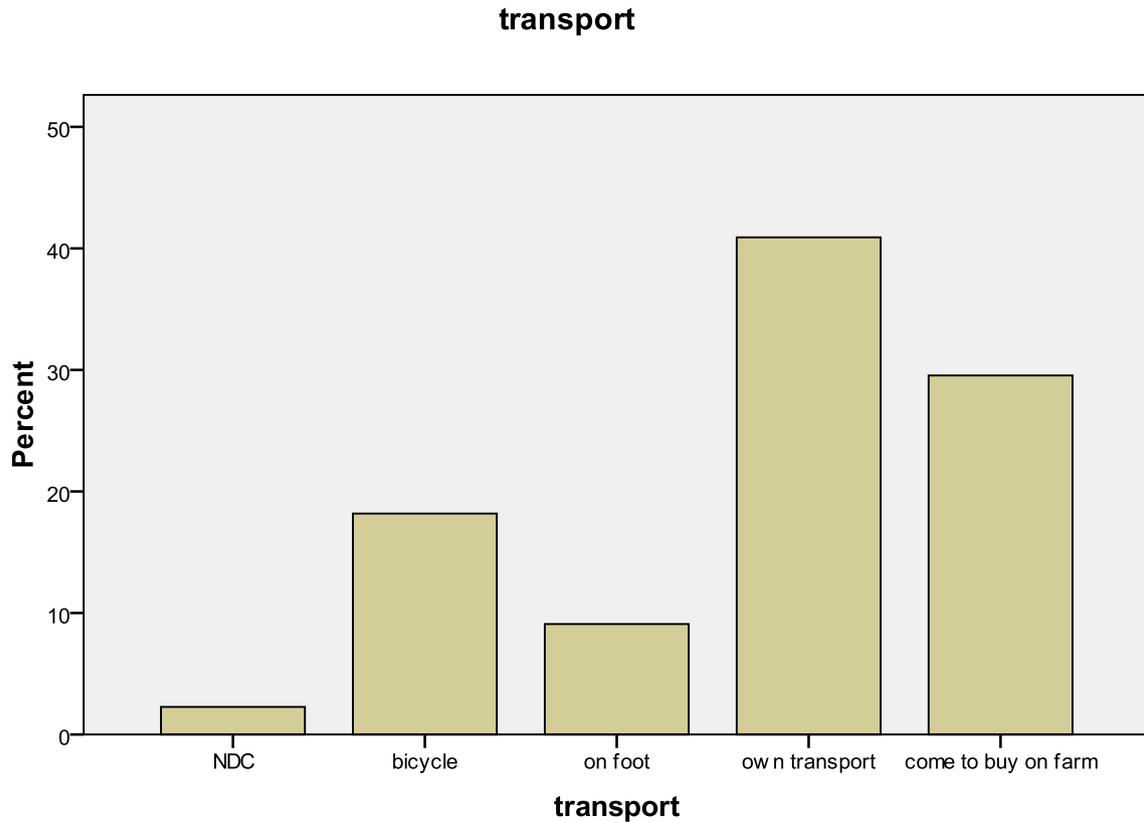


Figure 15: What is the mode of transport to deliver milk

In the of Marirangwe case where the is a DDP project, the MCC is far and farmers have to walk up to 15 km a day to bring milk . These producers will side market especially when they have low volumes that they can sell at home. Low volumes are common and farmers are not receiving extension advice since more than 55% respondents indicated that they are seldom or never visited by extension agents. Farmer in the communal sector complained of high mortality of their herds during the rainy season because of tick borne and anthrax and FMD outbreaks of 2007. Stock theft has been rampant in wards close to the city and in Marirangwe farmers too have lost their cattle to these cattle rustlers and also to incessant droughts that were experienced in Zimbabwe over the past decade.

6.3 Factors influencing herd performance

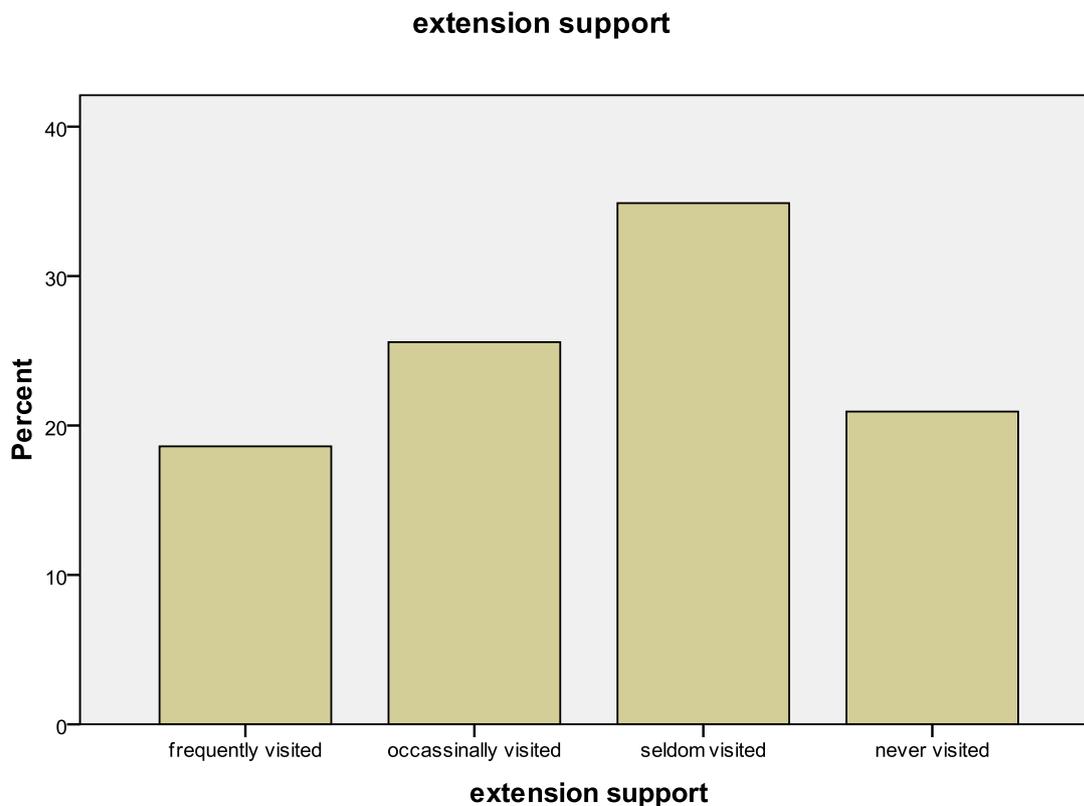


Figure 16: Do farmers get extension support

6.3.1 Cow productivity

Average daily cow production for the sample is 5,7l/day/cow. For resettlement areas average daily production is 4l/cow/day, 3l/cow/day for communal producers, 5,7l/cow/day for SSCFA and 9, 4/cow/day for LSCFA as shown in table 10 in below.

Table 10: Cow daily production

farming sector	Mean	N	Std. Deviation	% of Total Sum	Geometric Mean
SSCFA	5,6786	14	4,90528	31,7%	4,1514
communal	2,9750	8	2,30945	9,5%	2,0180
LSCFA	9,4091	11	6,01173	41,2%	6,9049
Resettlement	4,0182	11	2,63128	17,6%	3,3279
Total	5,7045	44	4,87671	100,0%	3,9126

The herds giving more than 15l/cow/day lie outside the normal curve (figure 16) yet these are the registered milk producers and the majority of herds that produce lower volumes are not registered and are the ones selling to the informal market.

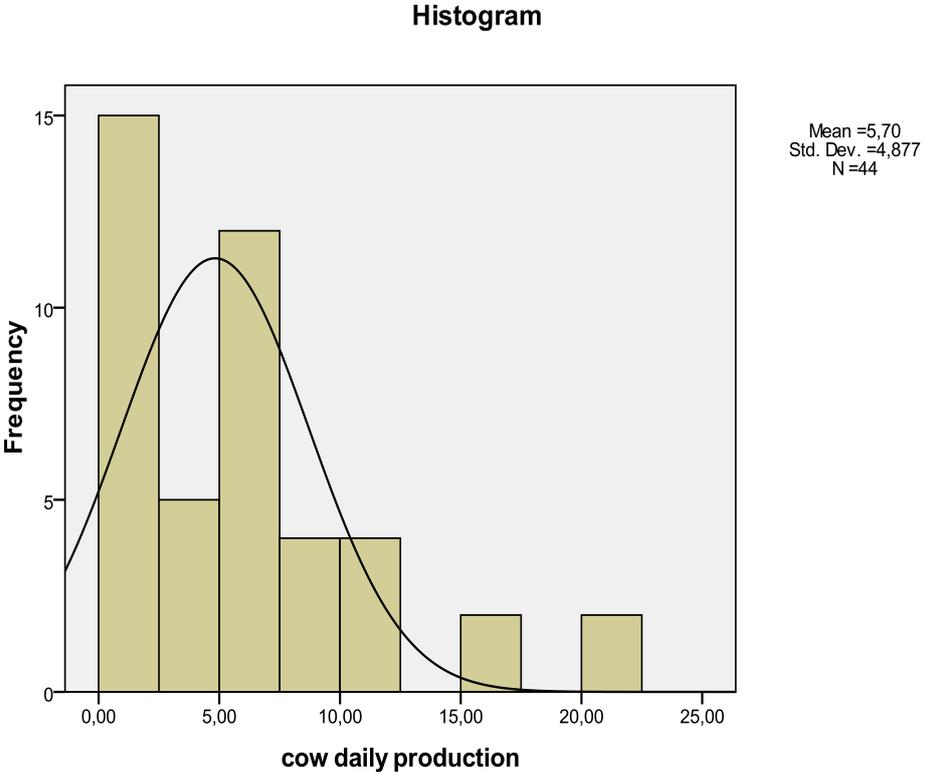


Figure 17: Average daily production per cow for sampled herds

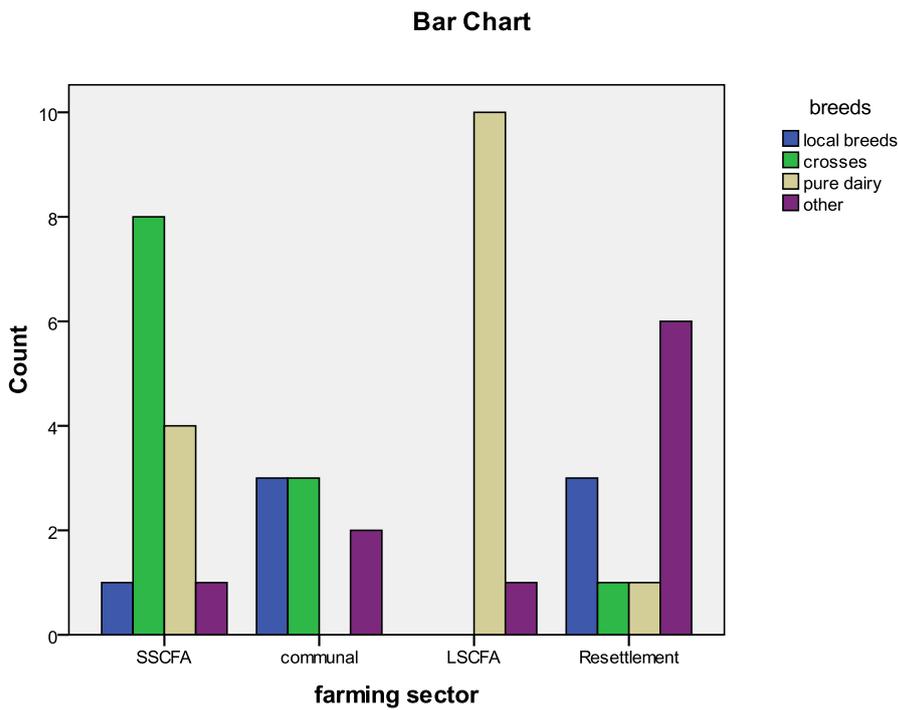


Figure 18: Breeds according to farming sector

The breeds for the sample herds in commercial sector are mostly pure dairy. In the SSCFA herds are local X dairy crosses and resettlement sector has more beef breeds and less dairy crosses. And communal farmers have local breeds and crosses.

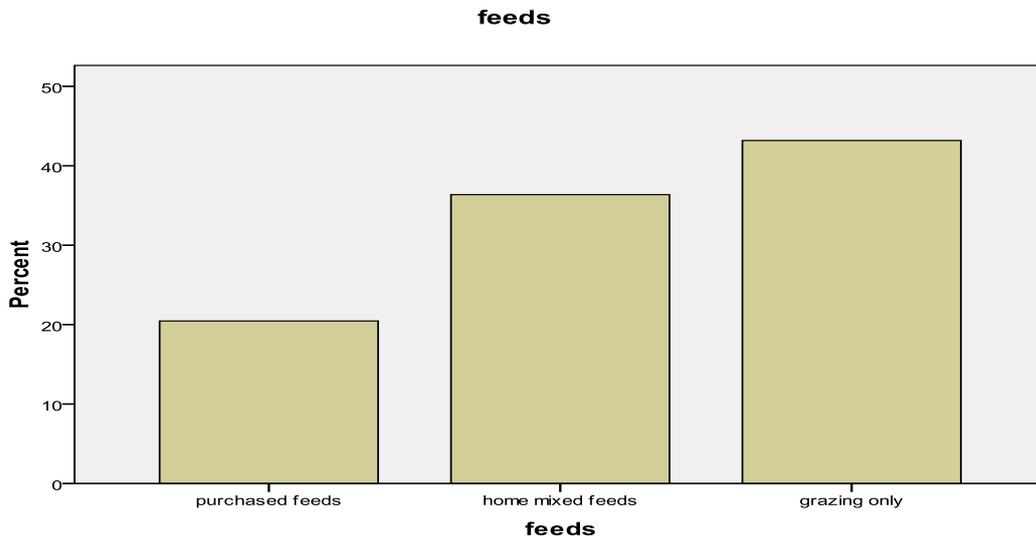


Figure 19: Feeds types fed to the sample herds

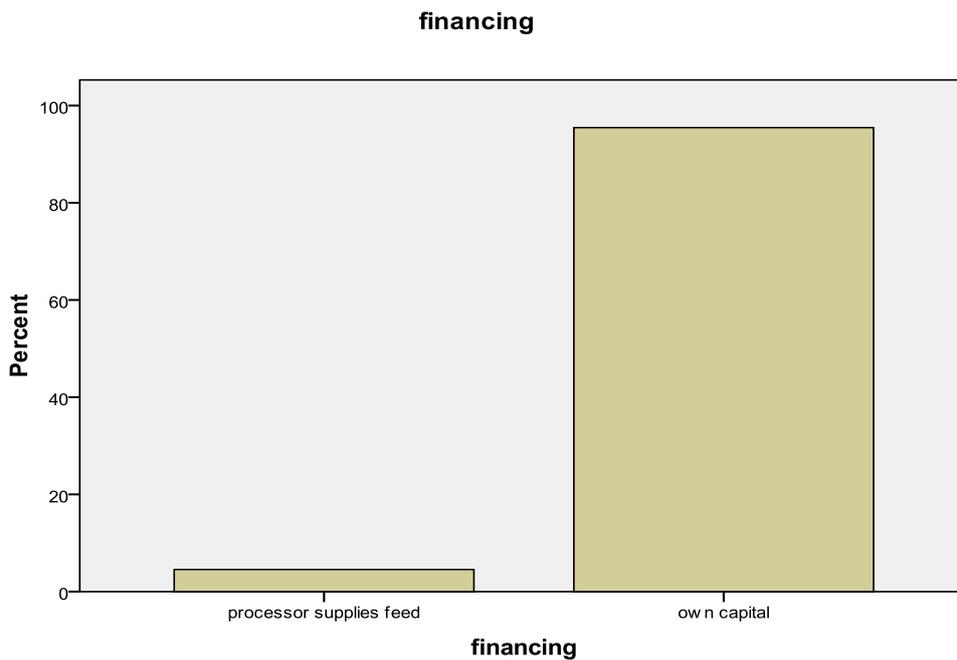


Figure 20: Source of finance for the sample farmers

95,5 % of the respondents finance their dairy enterprise and the 4,5% are getting support from processors. None of the respondents is accessing any bank loan or feed company 30 day loans.

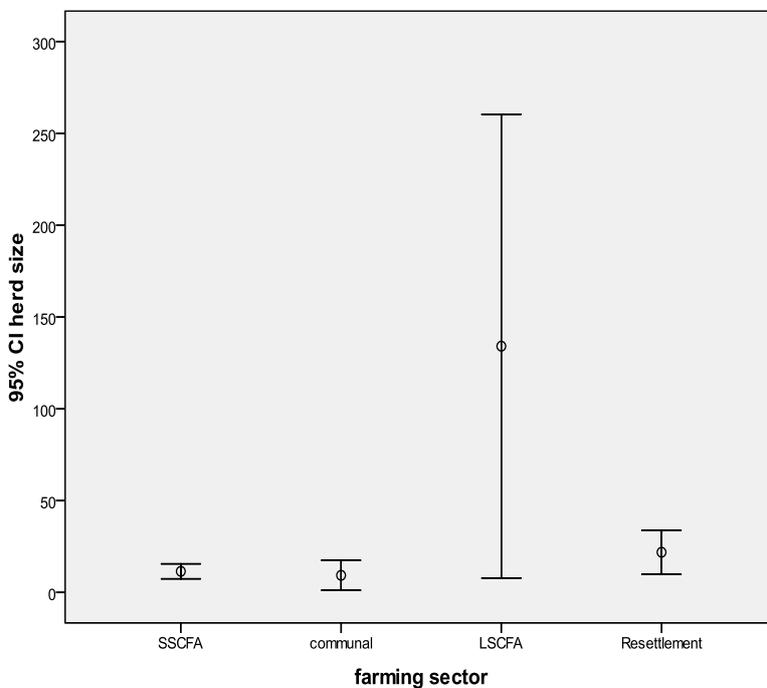


Figure 21: Differences in herd size in the farming sectors

There is a significant difference in herd size between farming sectors $p > 0,001$.

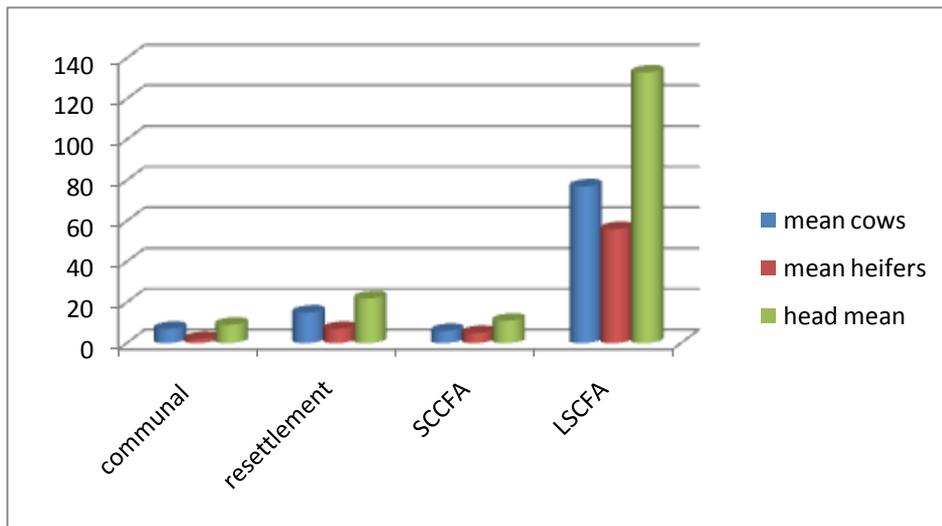


Figure 22: Mean herd composition for the sectors

The mean herd size for the different farming sectors show that the herd size for the sector in descending order is LSCFA, Resettlement, SSCFA and communal.

Chapter 7: Discussion

Raw milk supply to the formal milk chain has declined in this decade raising government concern over growth of the dairy sector as processing capacity is underutilised and cultured milk has vanished in the super market shelves. The emergence of the informal chain according to Ministry of Health is exposing the public to unsafe fermented milk and this can be costly to government in case of outbreak of an epidemic like cholera. How these challenges can be addressed is discussed.

7.1 What factors have contributed to the decline in raw milk supply to the processors?

Privatization of the Dairy Marketing Board in 1998 liberalised milk processing and a number of new players came into play. This meant processors had to compete for the milk from producers and a contracting system was introduced to assure processors of business. The dairy regulations were amended to allow farmers to sell raw milk on the farm when licensed as producer retailers; the regulation does not however give limits in terms of volumes as to how much is acceptable. The producers sell large volumes of this raw milk to their clients who process the milk by natural fermentation and sell the popular delicacy in the city, consumers like this milk with sadza a staple food. This however is not allowed by Zimbabwe legislation to sell unpasteurised milk in urban areas that's why vendors are chased off the streets by city health department.

Producers have most power in the formal chain because of the low supply, and they have become price setters of milk and if a processor cannot pay well they are always switching processors. Some producers have decided to go for value addition and have vertically integrated to processing and marketing. The regulations permit that and some farmers are taking advantage of the crisis in Zimbabwe and are processing without licences.

On farm processing has further strained the large processors who have had the number of producers fall from 574 in 1990 to 270 in 2008 due to land reforms in Zimbabwe. The political instability influenced farmers' decision to cull or stop breeding since they did not know their fate the following day. The dairy herd has been drastically reduced from 70 000 in 2000 to 45500 in 2008 (Dairy services statistics)

In response to the milk supply shortages the processors have devised ways of survival that have overlooked the consumer demands, like in the case study the focus for DZL is to maximise margins from the limited volumes they are receiving. This has led them to segment their market and from the findings it reflects that this led to thriving of the informal chain. The consumers that they did not target low income group with low purchasing power and they became the consumers for the informal chain, unfortunately they form the bulk of the population (90%) and the informal chain is thriving. DZL has since diversified into new product for new markets and they now produce juices and water which have better returns; they are however facing lots of challenge from imported milks which are cheaper than their products. In an effort to maintain their customers DZL are reconstituting milk from imported milk powders and this poses a great threat to their producers. DZL has penetrated markets in the SADC and COMESA with products like super milk, steri-milk and cheese when there is no milk on the domestic market. This all contributed to the loss in raw milk share which was channelled to the informal market that has a high local demand.

7.1.1 What are the benefits of the informal market?

A value chain is a specific type of a supply chain, one where actors actively seek to support each other so that they can increase their efficiency and competitiveness. They invest in time, effort and money and build relationships with each other actors to reach a common goal of satisfying consumer needs so that they can increase profits. (KIT and IIRR 2008)

The milk shortages in supermarkets are as a result of low milk supply and processors have low volumes to process. In the case of DZL operating at 30% capacity means overheads are shared on low volumes and to survive the processor has segmented the high end products for the high income group and hotels, which need high quality products. Supermarkets in the low density suburbs had lots of DZL products while the high density areas have no products. This has excluded the majority of Zimbabweans who are now getting their milk through the informal chain.

Milk vendors are entrepreneurs who have identified an opportunity in supplying fermented milk in the high density locations. Vendors have taken over the role of milk collection, from the producers 60 to 85 km from the city in the resettlement areas who apparently produce large volumes of raw milk. Vendors provide a market for this category, they take the risk of travelling to the farms to buy the milk and endure the transport difficulties but make a living out of selling milk, thus they have created employment for segment of the 80 % unemployed Zimbabweans.

The vendors have also identified the shortage of cultured milk in the supermarkets and have targeted the low income group which is the majority of Zimbabweans, 90% who are living below the poverty datum line and this group enjoys the traditional taste of naturally fermented milk which is the product the vendors sell at open markets, in offices, and door to door.

The naturally fermented milk is however more expensive per unit volume which contradicts Cousin, 2005 who argues that products in the informal chain are cheaper because of less transaction costs. Cousin further states that farmers get higher farm gate prices in the informal chain which is also different to the Seke case where farmers' get a value share of 17 % and the vendors get 83% value share (see figure 7). Value share of the formal chain is : producers get 22%; processors 53% and retailers 25%. This is clear indication that farmers supplying the formal chain get a better share and vendors exploit the farmers.

7.1.2 How much milk is produced at farm and of that how much is sold to the processors? (Formal chain)

The survey showed that processors get milk from 32 % of the sample farmers, while 68% sell to the informal channel. 50% are registered producers while 50 % are not registered. 27 % respondents are contracted and 73% are not contracted. Most of the respondents in LSCFA and SCCFA registered producers while all respondents from the communal and resettlement areas are not registered and this excludes their milk from the formal chain.

Table 11: Comparison of registration, milk delivery to processors and contracts by family sector

		are you registered		milk delivery		contracted	
		yes	no	yes	no	yes	no
farming sector	SSCFA	13	1	7	7	8	6
	communal	0	8	0	8	0	8
	LSCFA	9	2	6	5	4	7
	Resettlement	0	11	1	10	0	11
Total		22	22	14	30	12	32
Percentage %		50	50	32	68	27	73

This reflects that milk that is being accounted for is far less than the actual milk production and is being split among so many processors and some of the not registered but still taking their products into the market. The enforcement of regulations is hitting a hard wall due to scarcity of resources though the framework says the Dairy Services should register producers and processors are hindered by acute staff shortages.

ZDIT has always been supporting the Dairy services but due to the changes in the external environment they have adversely affected its revenue base since non registered producers do not pay levies and also all side marketed milk is not paying levies. This loophole in accounting for milk production is exaggerating low volumes being produced for instance in 2008 milk production was 50 million litres and it has to be plus all milk sold to the informal chain.

From the respondents it shows that a larger proportion of the producers selling to the formal market are LSCFA and SCCFA and milk production means for the sectors are 9,5l and 5,7 litres respectively. The two sectors have a higher proportion of dairy breeds and dairy crosses, and mostly use home mixed rations or purchased feed. The majority of farmers are not getting any financial assistance in form of micro-credit; can be an attribute to the low milk yields. Possibilities of the scope of scaling up can focus on financing and improving extension services.

7.1.3 How much milk is sold through alternative channels (informal chain).

The informal chain gets milk from 72% of the respondents and 28% sell to processors. 45% of the registered producers are side marketing and 91% of the unregistered producers sell to the informal chain. Mostly unregistered producers who are from communal and resettlement sectors sell their milk to the informal chain. The volumes are difficult to ascertain and no records were available from either Dairy Services or CSO. Cattle in this sector are mainly beef breeds and crosses with local breeds, their mean daily milk production is 4litres/ cow/ day for resettlement areas and 3 for communal. Milk lactation period ranges from 90 days to 150 Gambiza and Nyama (2000) the lower range will be used for communal areas and the mean of 120 days to estimate volumes that are sold to the informal chain.

It is estimated that 40% and 60% farmers have cattle in communal and resettlement areas respectively. The mean cow production from the sample is 4l/cow/day for resettlement and 3

l/cow/day for communal, and commercial farmers sell an estimated 15% of milk through side marketing (DHI estimates).

Total milk that ends up in the informal chain from communal and resettlement farmers plus milk side marketed by the commercial farmers.

Table 12: Estimate of milk supply to the informal chain

Volumes into the informal chain	
Communal	8050644
Resettlement	6885000
Sub total	14935644
Less 20% for home consumption	2987128.8
Available for sale	11948515.2
Volumes through side marketing	
LSCFA	1158984.75
SSCFA	660960
total	1819944.75
Total volume sold to informal chain	13768459.95

This shows that small holder farmers are selling more milk to the informal chain

7.2 What strategies can be employed to improve milk supply to the formal chain?

Changing mind-sets as well as written policy will greatly help forge a future for the dairy sector. The dairy industry in Zimbabwe in the 1990's was one of the most organised industries in the country and was competitive regionally, but with the land reform and economic crisis; it's no longer business as usual. The type of farmers has changed and so has farming systems, and so operating with old policies where DDP is mandated to start small holder dairy projects is not effective anymore, and it seriously needs rethinking.

7.2.1 How can milk supply to processors be enhanced?

The small scale farmers are now in the majority with smaller herds of lower productivity but they cannot continue to be undermined their importance has to be recognised sooner than later. A total of 14 520 plot holders in Seke district of which only 35 are LSCFA and 306 SCCFA and the rest (14 520) are small holder farmers. The theory of Gandhi supports production by masses and not mass production as a pro poor development strategy. Participation by the increased numbers is scaling out and can considerably increase national milk production.

Small scale farmers: Small scale farmers in Zimbabwe are mixed farmers and about 60% of households in resettlement areas and 40% in communal areas have cattle which are very important in the farming system as the cattle:

- provide draft power for tilling the fields and transporting goods,
- they produce manure which is used for fertilizing their fields
- providing milk and meat

The cattle are in a sense dual purpose in the sense of giving meat and milk; with the mindset of extension agents these cattle are not proper for milk although they acknowledge their milk production. Some cows although not the black and white give higher milk production than the average obtained for commercial herds in this sample. In resettlement areas some farmers have beef breeds and crosses e.g. with Brahman and they are milking and giving 8l/day.

Dairy production for extension workers and development agents is from the pure dairy cows but milk is milk whether it comes from a Friesland cow, beef master or Nkone. The thrust could be using the fact that most smallholders have cattle then try to gradually improve their milk production through breeding, feeding and other good farming practise. Feeding especially during the dry season when the veld has poor grazing crude protein (CP) around 28g/ kg dry matter (DM) from Elliot and Folkertsen (1961). The quality of grazing for the sour veld that is common in the high rainfall areas in natural regions IIa and IIb in which the district lies are poor in the dry season and cannot meet the requirements of a lactating cow without supplementary feeding. Yet 42% of the sample herds are only grazed, and winter season must have low yields. This can be attributed to the lack of funding for the sector that is reflected by 95% farmers using own capital for dairying.

Producer Organisations: Farmers in their communities are organised and are members of some farmer organisation; SHODFAZ for dairy farmers and ZFU for all small holder farmers producing a wide range of commodities and NADF for commercial dairy farmers. These producer/ farmer organisations can be instrumental in the call for including farmers in the formal chain or formalising informal chains.

PO are a fundamental building block of dairy development agenda, by helping in organising their members and facilitating the innovation process targeted at reaching higher quantities and better quality of raw milk by providing on farm technical assistance; thereby augmenting government efforts of providing free extension service like NADF has extension unit. PO can link producers to markets and ensure farmers have adequate information on quality standards expected this will be an opportunity to strengthen their membership as more farmers will join in order to get access to the services.

Being advocacy organisation the SHODFAZ; NADF and ZFU can lobby for policy change on behalf of the members. Issues for lobbying are relaxing of conditions for registration so that they become inclusive for small holder farmers. Challenges that may be faced by the PO are that they are member organisations and their strength is as good as its members. The has different types of people making a heterogeneous group and efforts to coordinate the value chain become tricky. For example the current chairman of NADF is both a producer and a processor and in whose interest he is making decisions? There are trade-offs between equity and efficiency as he battles to keep credibility from outside and maintain member control or to lobby for higher producer prices from processors.

The farmers can be linked to markets but complication may come from farmers failing to comply with agreements, especially where there is a contractual agreement; right quality and agreed quantity and continuous supply also strict rules are inevitable. It is of key importance that the capacity building efforts focus on management and staff working for the PO. So that

they can lobby for favourable legislation; improve negotiating skills for entering into partnerships either for vertical or horizontal Integration. The effort of PO will be to transform the milk producers from adhoc spot markets and formalise the markets by improving the chain relations as shown in figure 21 below.

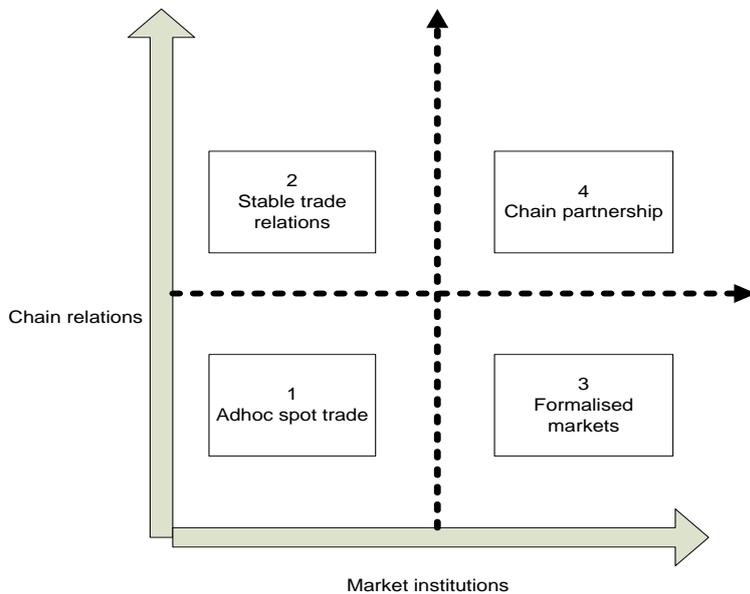


Figure 23: Chain empowerment

Source: KIT and IIRR 2006

Contract farming

The survey results indicate that 27 % of the sample is contracted while 73% are not. Statistically the chi-square test has show that there is a significant difference in registered that are contracted. (Figure 7) Contracts are however important in supporting the production base. Value chains have become increasingly buyer driven and vertically integrated. Small holders in this sample are struggling to finance their dairy business due to capital constraints, or failure to access bank loans; feed companies have too stopped giving farmers the 30 day loans due to the economic crisis Zimbabwe went through and the hyper inflationary environment.

Smallholder farmers use family labour and contract farming would reward their effort through increased output after optimum inputs are used. The major setback with contracts is that farmers lose control over their produce and sell to contractor at agreed prices. This is disadvantage in hyper inflationary environment that existed; dollarization of the economy might solve this complication. Farmers out of desperation side market their product to avoid repayment of loans. This is a great challenge and POs have to play a pivotal role in ensuring the stability and longevity of contract farming.

The in this case study efforts by processors to assist the farmers has been adversely affected by side marketing although Marirangwe farmers continue to get inputs and heifers from their processor and gradually repay from their milk cheque. Provision of extension and services is helping some processors maintain good rapport with producers. During ASPEF

disbursement the processors were guarantors for their producers and the few that benefitted improved their farm productivity.

Policy and regulations

The dairy development policy framework is looking at the government leading dairy development through DDP, which since inception in 1985 has established 35 projects and these still contributing just 5% of milk intake. There is definitely a need to revise the strategies and work on the inclusion of the small holder farmers into the formal chain. India opened up the sector for DFI and many companies are into milk collection and processing e.g. Dynamix operating in Maharashtra, India is collecting milk from small holder farmers for their processing plants.

The case for Zimbabwe already has standards setting body for milk quality and product certification and a revision of regulations to make sure they are not a barrier to inclusion of the small holder into the formal milk chain is needed. The continuous harassment of the milk vendors is socially bad since this category of entrepreneurs is trying to improve their livelihoods at the same time linking farmers to the consumers. Engaging them will help find sustainable solutions that can be incorporated into a new policy framework. Policy change in raw milk vending can be modified and allow training and licensing rather than policing to improve milk safety in traditional markets, through use of improved technology.

The scaling up process of the dairy farms will need to be accompanied by an effective use of available public support through extension services; financial, consultancy or legitimating, which is especially crucial at the start-up of a new initiative. Private Public Partnerships (**PPP**) will invite investors and NGOs to support the development of the dairy sector. Such a support reduces the related risks and shapes up a more favourable environment for the initiative. All actors in the chain have to change from being production driven but rather be demand driven or market driven i.e. produce what the market requires

Production standards contribute to building consumers' trust. If these standards are made transparent to them by communication, it is much easier for consumers to have confidence. The requirements, which may comprise quality, provenance or way of processing, are fulfilled. Informed consumers who 'see' their requirements fulfilled contribute considerably to a stronger embeddedness of the product or even of the initiative as a whole. This can help processors to keep high quality standards for their products and Dairy Services in collaboration with Consumer Council of Zimbabwe and Standards Association of Zimbabwe should ensure set standards are maintained. Consumers' education is vital especially on food safety issues and promotion of consumption of milk and milk products.

Improved provision of extension services

The challenge for the dairy industry therefore is to shift smallholder milk producers' adhoc spot trading to formalised markets in which markets are transparent and standardization of quality grades and enforcement of contracts occurs. For this to happen, the government should play a facilitative role in the following

- Building capacity of producer organisation ZFU, SHODFAZ and NADF. Smallholder milk producers on the need to organize themselves into marketing groups in order to benefit from bulk purchasing and also to improve their bargaining power within the chain. Farmers on the other hand should be willing to innovate and take risks.
- Growth implies a more intense use of existing resources, scaling up implies a different organisation of resources (e.g. from informal to formalised, from artisanal to industrial, from local to national or international markets).

- A clear strategy regarding management and marketing allows a more efficient coordination of all processes along the chain.
- Continuous innovation is an important factor for growth or scaling up. Research for development should be supported and given enough resources. In breeding, feeding and animal health.
- Farmer training on GAP (Good Agricultural Practice) will improve production on farm and increase the supply base for both the formal and informal chain.

Coordination and networking.

- Organisation of industry through forums where stakeholders can sit and understand and respect each other's role in the chain and improvement of networking among stakeholders.
- A milk production recording scheme can help identify high potential areas through milk recording or the census returns through Central Statistical Office.
- Improving identification and traceability for herd improvement purposes which is important for export and also reduction of stock theft which is rampant especially close to Harare, where cattle rustlers are getting a ready market for meat. DHI can help in the identification traceability since they can also use it to the advantage in herd data recording.

Milk collection

NDC has become irrelevant as the national milk transporter and processors have to device strategies of milk collection. Only 2% from the sample use NDC transport; this is also because of the high proportion of small holder farmers. A new strategy in milk collection is inevitable and the processors have to seriously consider this set back.

Resettlement and communal areas don't have significant difference in cow productivity and it is a worthy cause to venture into collection of milk currently sold to the informal chains who buy milk at farm gate. The villages are well planned with a rural service centre with electricity and this makes milk collection centres a possibility. Road network is in place although it is a gravel road the resettlement areas are accessible, road networks for Seke communal areas are also good.

Increasing milk supply base

Efforts by DZL to horizontally integrate into improving its supply base have failed because of the land tenure that does not allow land to be owned by companies like DZL. The Build Operate and Transfer project implemented by DZL has yielded positive results although because of the weak contracts some farmers have switched processors. Currently there is no loan facility in the banks to support dairy farmers.

7.2.2 What can be done to improve milk safety?

The selling of unpasteurised milk in urban areas is highly risky worse still it is unpackaged even if it were pasteurised chances of recontamination are high. Secondly pasteurised milk cannot be naturally fermented which is what consumer like about milk sold by vendors. The risk of this milk has not really been established and it would be interesting if further research would ascertain food safety risks in naturally fermented milk.

- Training on milk handling and food safety has helped to improve regulating the informal sector in countries such as Kenya where 80 % milk goes through the informal chain. (ILRI 2004) This can also be tried in Zimbabwe.
- Provision of utensils that reduce contamination like steel or aluminium cans rather than using plastic cans can help reduce contamination.

- Shelter can reduce risks of food contamination instead of selling in open air; knowing that they can buy the milk of their taste in a kiosk at their convenience will improve business for the informal chain.

Fears are however in the extra costs for rentals and licences as the traders have capitalised on the open markets or door to door vending which is very popular in Zimbabwe; where they neither pay any levies nor have to observe set standards.

7.2.3 Benefits of formalising the informal chain.

The milk vendors have 83% value share while farmers get only 17%, while the formal chain has 22% value share for the farmer indicating high exploitation of resettlement farmers with no access to formal markets. If the formal milk chain in the resettlement areas is developed, then farmers can get higher incomes from the milk which will trigger increased production from laws of supply and demand. The increase in production will then benefit the processors who are struggling to utilize their processing capacity. Increased milk supply will also help in the revising the product mix to cater for the neglected social classes who are buying milk in the open market. This is anticipated to reduce the informal sector and bring most milk into the formal chain; where consumers are guaranteed of high quality products that meet the international standards of food safety.

Investors will find lucrative business within the dairy sector as demand for services increases like stock feeds, veterinary drugs and vaccines, milking equipment and utensils. and this will contribute to the economic growth of the country. Per capita consumption of milk will improve and the health of the nation will also be improved. Livelihoods for the small holder farmers will be enhanced and poverty level will be reduced which is the ultimate goal of government of having a department that deals with livestock production and development.

Chapter 8: Conclusion and Recommendations

Conclusion

From the survey results it a considerable amount of milk is being sold through the informal chain. That resettlement and communal farmers are milking the 'beef' cows are contributing **13, 5 million litres** annually to the informal milk chain, to which they have access. They are not linked to any formal markets. 13, 5 million litres, if added to national production it contributes 25%.

With a small proportion of large scale commercial farmers (35 LSCFA compared to 14826 small holders) if milk production has to remain the key enterprise then production by masses has to be encouraged; to promote dairy development, (Gandism theory). **The revival of the dairy industry is dependent on the success in inclusion of the small holder farmers into the formal chain.**

The weak linkages in the current formal chain have exuberated the thriving of the informal chain. Government regulations are not sufficiently support formal chains and their enforcement and monitoring has to be supported by an effective extension service. The dairy development policy framework has failed to keep pace with developments of the 21st century.

Recommendations:

Policy on dairy development needs to be revised to make a conducive environment for small holder dairy development. The mind set of beef and dairy was applicable for commercial production but today's farmer is milking the beef animal and this milk has to be collected. Farmers need support to meet market, registration and certification standards that can link them to sustainable markets. Dairy Services has to cover milk producing areas more and provide the regulatory services to the small holder farmers who are ignorant of the possibilities of formalising their milk sales. This will contribute to the inclusion of the small holder in the formal chain.

Regulations have to put controls in what is happening as farmers are scaling up and vertically integrating in order to expand their business. The loopholes are making some farmers break regulations and side market their milk to vendors who bring the milk to urban consumers. These vendors have to be included in the regulations and certified so as to ensure public safety. Since pasteurisation is not an option for naturally fermented milk vendors can be trained in safe handling of milk to reduce chances of food contamination. Consumers have to be educated on food safety issues.

Collect Better Statistics. The government of Zimbabwe should put in place mechanisms that would generate better statistics on the country's dairy industry. The national intake is not a true picture of the country's milk production. Central Statistics office should improve data collection in the cattle census and include milk production so that estimates for per capita consumption are closer to reality. Harmonising functions of the various government departments can assist in reliable and consistent database usable by all departments. Dairy Herd Improvement (DHI) which is not compulsory at the moment can help consolidate data on herd performances and milk recording can help government planners to identify priority areas. Livestock identification can help in keeping a accurate database and projects for dairy development can really focus on high potential areas.

Coordinating: Coordinating industry and positioning each stakeholder, clarifying the roles improves linkages and relationships and they can work together to reach a mutually beneficial situation and the chain will be empowered. If the informal chain is included in the regulations then the government can aid in organising the group of informal vendors. They will then have been included them in the formal dairy chain represented by Zimbabwe Dairy Industry Trust (ZDIT) and they will be “legally” included in the dairy industry, were they are currently not recognised. The involvement of the vendors on ensuring public safety will yield positive results.

Producer organisations (PO) can be instrumental in linking producers with markets especially because the farmers are non entrepreneurial; contract farming may include this category of farmers. Consumers are interested in a continuous supply of high-quality milk products and the processors are’ interested in a content customer and therefore in delivering a high quantity of quality milk continuously is obligatory for producers. This will inclusion of the small holder farmers will increase the milk supply base for the formal chain.

PO may however have limited capacity to do this, potential facilitators for change, government, NGOs and consultants need to be invited to work with farmers’ unions to build their capacity in value chain development.

Processors in a bid to device survival mechanisms have fuelled the informal market by shifting their segmentation to exclude the majority of Zimbabweans who cannot afford their innovative high end products. They are surviving but the question is; are they sustainable? The processors are moving to invest in other countries all because they don’t see the potential in Zimbabwe. But the way forward is to go into public private partnerships (**PPP**) and jointly revive the dairy industry. Companies should invest and provide extension services to their producers i.e. Artificial Insemination services, veterinary services, training on good farming practice and infrastructure development to augment government efforts.

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Annexes

Annex 1: Tables showing analysis of herd performance

Table 1: are you registered * milk delivery Cross-tabulation

			milk delivery		Total
			yes	no	
are you registered	yes	Count	12	10	22
		Expected Count	7,0	15,0	22,0
	no	Count	2	20	22
		Expected Count	7,0	15,0	22,0
Total		Count	14	30	44
		Expected Count	14,0	30,0	44,0

Table 2: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	10,476 ^a	1	,001		
Continuity Correction ^b	8,486	1	,004		
Likelihood Ratio	11,323	1	,001		
Fisher's Exact Test				,003	,001
Linear-by-Linear Association	10,238	1	,001		
N of Valid Cases	44				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.00.

Table 3: herd size

farming sector	Mean	N	Std. Deviation	% of Total Sum	Geometric Mean
SSCFA	11,43	14	7,068	8,2%	9,60
communal	9,25	8	9,765	3,8%	5,46
LSCFA	134,09	11	188,047	75,7%	60,25
Resettlement	21,82	11	17,848	12,3%	16,77
Total	44,30	44	105,359	100,0%	15,76

Table 4: cow daily production

farming sector	Mean	N	Std. Deviation	% of Total Sum	Geometric Mean
SSCFA	5,6786	14	4,90528	31,7%	4,1514
communal	2,9750	8	2,30945	9,5%	2,0180
LSCFA	9,4091	11	6,01173	41,2%	6,9049
Resettlement	4,0182	11	2,63128	17,6%	3,3279
Total	5,7045	44	4,87671	100,0%	3,9126

ANOVA

Table 5: herd size

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	119201,685	3	39733,895	4,438	,009
Within Groups	358119,474	40	8952,987		
Total	477321,159	43			

farming sector * breeds Cross-tabulation

Count

		breeds				Total
		local breeds	crosses	pure dairy	other	
farming sector	SSCFA	1	8	4	1	14
	communal	3	3	0	2	8
	LSCFA	0	0	10	1	11
	Resettlement	3	1	1	6	11
Total		7	12	15	10	44

Annex 2: Questionnaire for dairy farmers

1. Sex male female

2. What is your age?

3. What is your farm size?

4. Are you a registered yes no

5. If yes what you are registered as?

Producer producer wholesaler producer retailer producer processor retailer

6. If no why you are not registered

Failed to meet standards did not know procedure not yet visited by inspectors other

7. How many animals do you have on your farm?

	number
Cows	
Heifers	

8. If possible please specify the breed

breed	number
Local	
Local x dairy	
Pure dairy	
Other	

9. What is the average daily production for the herd?

10. Do you deliver all milk produced on farm yes no

11. If you don't, who do you sell the milk to?

Neighbours vendors from Harare motorists by road side open market

Other specify

12. State three reasons why you sell your milk to the this customer

1-----

2-----

13. How do you deliver your milk

NDC bicycle on foot own transport come to buy on farm

Other specify

14. How far are you from milk collection centre?**15. How often do you deliver milk**

Once a day twice daily once in three days other specify

16. What is the average transport cost per litre of milk from your farm?**17. What quality grades do get for your milk**

Very good grades moderate good grades good grade moderately poor grade

Very poor grades

18. What feed do you give your cows?

Purchased feeds home mixed feeds grazing only irrigated pasture only

Other specify

19. How do you finance the dairy enterprise?

Bank loan stock feed company loan Processor supplies feed

Own capital other source specify

20. Are you contracted by any processor? yes no

21. Is the payment system is in place suitable for you?

Highly convenient moderately convenient convenient

Moderately inconvenient highly inconvenient

22. How often get any extension support?

Frequently visited occasionally visited

Seldom visited never visited

23. If yes from who

Government extension worker input suppliers' processors
other

24. Do you have any other source of income off farm

Employed full time elsewhere have contracts off farm full time farmer other specify

Annex 3: Check list for case study

a) Check list for DZL

- What is the processing capacity for Harare Region?
- Raw milk intake trends for past 10 years.
- How is milk supply secured?
- What is their milk payment scheme for farmers?
- What support do they give to producers?
- What challenges do they face in getting raw milk?
- What strategies are employed to get raw milk?

b) Milk vendors: An observation on the morning and evening market will check on the **milk vendors**, questions on checklist

- What is done vendors buying this milk to ensure they get a regular supply of raw milk?
- Who are the consumers for the naturally fermented milk?
- Who is buying milk from farmers?
- At how much is milk sold?
- Why do they prefer naturally fermented milk?

Annex 4: National milk intake 2006 to 2008

	2006			2007					
Month	Intake by Processors (litres)	*Retailed by Producers (litres)	Total (litres)	Intake by Processors (litres)	Intake % difference	*Retailed by Producers (litres)	Retailed % difference	Total (litres)	Total % difference
Jan	7,525,582	411,193	7,936,775	7,056,480	-6.2%	388,262	-5.6%	7,444,742	-6.2%
Feb	6,051,227	342,887	6,394,114	6,020,828	-0.5%	345,435	0.7%	6,366,263	-0.4%
March	6,412,183	362,033	6,774,216	6,585,530	2.7%	369,345	2.0%	6,954,875	2.7%
April	6,491,651	366,609	6,858,260	6,262,956	-3.5%	354,939	-3.2%	6,617,895	-3.5%
May	6,842,144	374,460	7,216,604	6,555,613	-4.2%	368,344	-1.6%	6,923,957	-4.1%
June	6,565,405	355,850	6,921,255	6,389,057	-2.7%	344,732	-3.1%	6,733,789	-2.7%
July	6,902,558	364,507	7,267,065	6,538,111	-5.3%	349,365	-4.2%	6,887,476	-5.2%
August	7,100,615	374,391	7,475,006	6,379,585	-10.2%	351,682	-6.1%	6,731,267	-9.9%
Sept	6,844,636	369,215	7,213,851	5,747,300	-16.0%	354,746	-3.9%	6,102,046	-15.4%
Oct	7,098,663	378,667	7,477,330	5,318,139	-25.1%	342,142	-9.6%	5,660,281	-24.3%
Nov	6,693,987	361,611	7,055,598	4,804,281	-28.2%	315,049	-12.9%	5,119,330	-27.4%
Dec	6,807,969	376,276	7,184,245	5,076,132	-25.4%	328,825	-12.6%	5,404,957	-24.8%
Total	81,336,620	4,437,699	85,774,319	72,734,012	-10.6%	4,212,866	-5.1%	76,946,878	-10.3%
	2007			2008					
Month	Intake by Processors (litres)	*Retailed by Producers (litres)	Total (litres)	Intake by Processors (litres)	Intake % difference	*Retailed by Producers (litres)	Retailed % difference	Total (litres)	Total % difference
Jan	7,056,480	388,262	7,444,742	5,209,004	-26.2%	346,815	-10.7%	5,555,819	-25.4%
Feb	6,020,828	345,435	6,366,263	4,704,728	-21.9%	314,124	-9.1%	5,018,852	-21.2%
March	6,585,530	369,345	6,954,875	4,624,995	-29.8%	313,683	-15.1%	4,938,678	-29.0%
April	6,262,956	354,939	6,617,895	4,121,068	-34.2%	339,576	-4.3%	4,460,644	-32.6%
May	6,555,613	368,344	6,923,957	3,834,092	-41.5%	335,828	-8.8%	4,169,920	-39.8%
June	6,389,057	344,732	6,733,789	3,752,282	-41.3%	371,835	7.9%	4,124,117	-38.8%
July	6,538,111	349,365	6,887,476	3,636,123	-44.4%	353,460	1.2%	3,989,583	-42.1%
August	6,379,585	351,682	6,731,267	3,357,063	-47.4%	280,841	-20.1%	3,637,904	-46.0%
Sept	5,747,300	354,746	6,102,046	2,922,965	-49.1%	283,696	-20.0%	3,206,661	-47.4%
Oct	5,318,139	342,142	5,660,281	2,355,726	-55.7%	207,811	-39.3%	2,563,537	-54.7%
Nov	4,804,281	315,049	5,119,330	1,924,569	-59.9%	225,160	-28.5%	2,149,729	-58.0%
Dec	5,076,132	328,825	5,404,957	2,334,619	-54.0%	285,857	-13.1%	2,620,476	-51.5%
Total	72,734,012	4,212,866	76,946,878	42,777,234	-41.2%	3,658,686	-13.2%	46,435,920	-39.7%

Source Dairy services

Annex 5: Market share for DZL

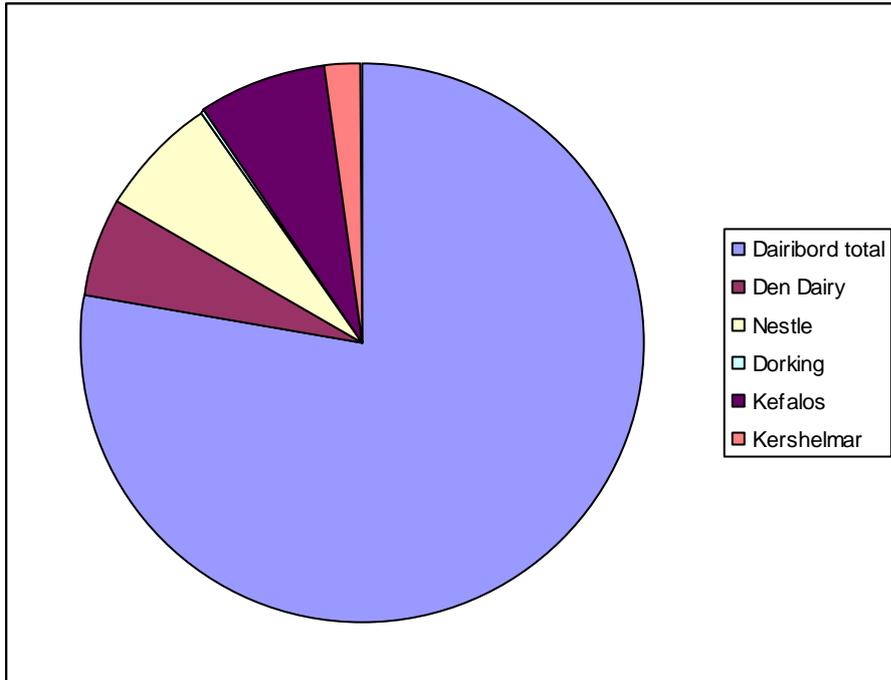


Figure 1: Raw milk share for DZL

DZL enjoys a milk intake of over 80% of national milk intake in its processing plants in the 6 regions. The limitation of the milk recording system is that it accounts for only the milk which comes through registered producers and sold to processors.

Annex 6: Milk production trends 1998 to 2008

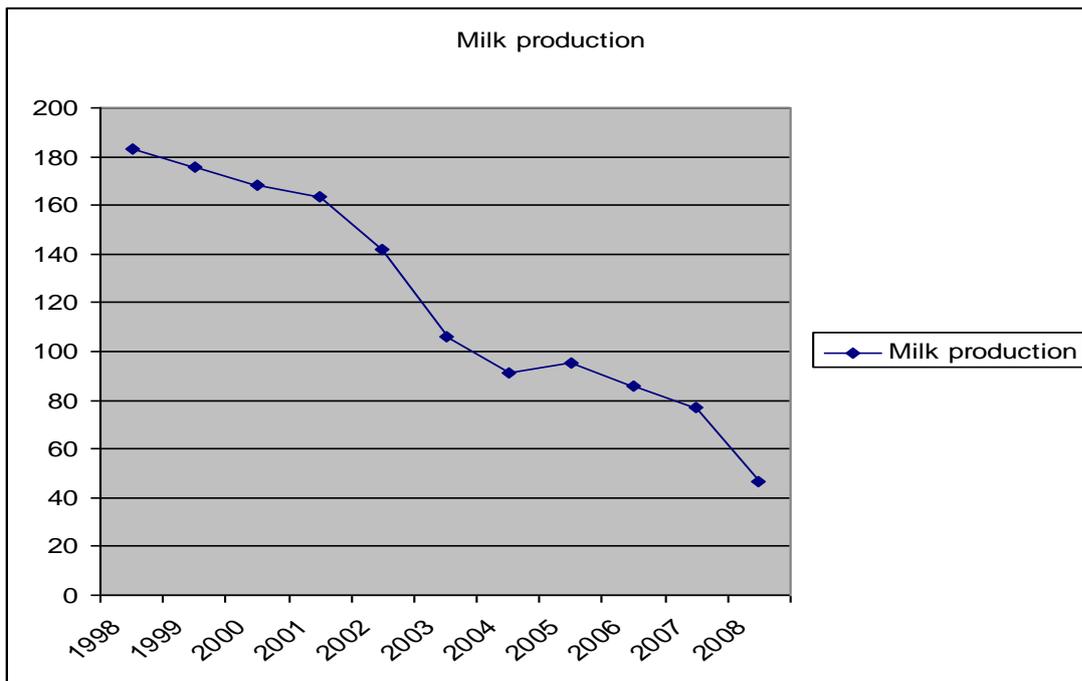


Figure 2: milk production trend 1998 to 2008

Annex 7: Cost of production for milk on commercial farms

	Total Cost per annum	Total Cost per Cow	Total Cost per Litre
Labour	5,002.99	38.19	0.01
Tractor Operations	4,118.76	31.44	0.01
Feeds :			
Silage	29,949.21	228.62	0.05
Hay	4,760.94	36.34	0.01
Concentrates	153,695.21	1,173.25	0.26
Milk	2,381.40	18.18	0.00
Dipping	1,273.01	9.72	0.00
Dosing	1,488.82	11.37	0.00
Vets. & Medicines	13,095.86	99.97	0.02
Detergents	5,509.16	42.05	0.01
A. I.	24,443.16	186.59	0.04
Levy	1,336.90	10.21	0.00
Transport	54,000.46	412.22	0.09
Insurance	410.25	3.13	0.00
Electricity	3,620.68	27.64	0.01
Miscellaneous Costs**	39,312.00	300.09	0.07
TOTAL VARIABLE COSTS	344,398.80	2,629.00	0.59
GROSS INCOME	223,571.74	1,706.65	0.38
GROSS MARGIN	-120,827.05	-922.34	-0.21
Return per \$ TVC	0.65	0.65	0.65
		Standard Milk price per litre	\$0.35
		Average Milk Price Including Premium	\$0.36