AN INVESTIGATION OF THE CONTRIBUTION OF NEW INNOVATIONS IN THE GROWTH OF DAIRY INDUSTRY IN KENYA

BY

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KENYATTA UNIVERSITY

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Declaration

This research project is my own original work and has not been presented for a degree award in any other university.

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Chairperson,
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Signature.......................... Date 21.05.08
Dedication

This work is dedicated to my beloved wife Grace Ndungu. Her support, patient understanding and encouragement greatly influenced much the completion of this research project. Also her passion for being an entrepreneur has been a great source of strength and inspiration to me.
Acknowledgements

This work would not have been successful without the assistance and encouragement from some individuals who in one way or another gave in their contributions. My special gratitude and appreciation goes to my supervisor, Mr. A.O Jagongo who willingly and cheerfully taught me how to write a research project with much enthusiasm and encouragement.

More sincerely, I convey my heartfelt gratitude to my family for their patience and understanding through out my struggle with this work. Special thanks go to Mr. Njoroge who carefully and neatly pieced this work together. However I am solely responsible for the content of this project.
Abstract

Prior to liberalization of the dairy industry, Kenya Co-operative Creameries founded in (1962) enjoyed the monopoly of processing and selling milk products in Kenya (Omiti 2000). The effect of liberalization was the entry of new Milk players in the dairy industry. By 2005 Kenya Dairy board had 52 licensed dairy firms out of which 34 were operational according to Kenya Dairy board report (2005). The purpose of this study was to establish the contribution of new innovations in the growth of dairy industry in Kenya after liberalization in May 1992. Innovations are new ways adopted by dairy firms to increase their market share. This includes new products, new markets, new technology, new organizations formed to promote their industry and new methods of promoting milk drinking aimed at cultivating milk drinking culture. According to Kenya Government (2005) the demand of milk was 2.7 billion against national output of 2.74 billion litres. Liberalization of the dairy industry, led to increased competition, which resulted in collapse of well-established dairy processors such as Premier and Aberdares dairy (Kenya Dairy Board 2005). The new players in the market such as Spin Knit and Brookside Ltd become more competitive and succeeded to outdo the already established players and started commanding the larger share of the market. The question is, what are the contributing factors for both failure and success of these firms? This study sought to establish whether new innovations adopted by milk processing firms contributed to their success and whether lack of these innovations contributed to the collapse of some of the dairy firms. The objective of this research project was to identify new innovations in the milk processing firms after liberalization and how these new innovations had contributed to their market share. The target Population was all the 34 milk-processing firms, which were functional and registered by Kenya Dairy Board by 2005. The researcher conducted a census on these firms. Methods of data collection included questionnaire administration and observation. Questionnaires were administered to all the registered and operational milk processing firms in Kenya. Data analysis was done using both qualitative and quantitative technique. The data was presented using tables, bar charts, pie charts, percentages among other. The study established that new innovations had contribution greatly to the increase in sales and the overall growth of the dairy industry. The study identified the new innovation adopted in the dairy industry in the last three years which included; new products, new markets, new packaging, new...
management and new technology. The factors that contributed greatly to growth of the dairy industry were found to be; market demand, new packaging, management style, sources of finances and new technology. Competition was found to be a major challenge that always affected the operations of the dairy firms. The study recommended that the prices for dairy products be regulated by a government body to prevent big and well-established firms from undercutting small and upcoming ones. The study found a need for a national policy on standards governing the industry from the farm level to finished products. This will ensure that the products that finally go to the markets are clean and up to standard for consumer use. Finally the government needs to play a significant role in ensuring that the dairy firms are well supplied with good and efficient infrastructure. This will save on cost of production and hence make the product affordable to the consumers.
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<th>Acronyms</th>
<th>Description</th>
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<tbody>
<tr>
<td>A.I</td>
<td>Artificial Insemination</td>
</tr>
<tr>
<td>C.O.M.E S.A</td>
<td>Common Markets for East and Southern Africa</td>
</tr>
<tr>
<td>D.I</td>
<td>Disruptive Innovation</td>
</tr>
<tr>
<td>D.I.P</td>
<td>Disruptive Innovation Product</td>
</tr>
<tr>
<td>D.R.C</td>
<td>Democratic Republic of Congo</td>
</tr>
<tr>
<td>F.A.O</td>
<td>Food and Agriculture Organization</td>
</tr>
<tr>
<td>K.A.R.I</td>
<td>Kenya Agricultural Research Institute</td>
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<tr>
<td>K.C.C</td>
<td>Kenya Cooperative Creameries</td>
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<tr>
<td>K.D.B</td>
<td>Kenya Dairy Board</td>
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<tr>
<td>KGs</td>
<td>Kilograms</td>
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<td>S.I</td>
<td>Sustaining Innovation</td>
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<td>S.I.P</td>
<td>Sustaining innovation product</td>
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<tr>
<td>U.N</td>
<td>United Nations</td>
</tr>
<tr>
<td>U.S.A</td>
<td>United States of America</td>
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## Operational Definition of Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Innovation</td>
<td>New ways of doing things that have benefits</td>
</tr>
<tr>
<td>Liberalization</td>
<td>Market oriented economic reforms that had started in many Developing countries in early 1980s and intensified in the 1990s</td>
</tr>
<tr>
<td>Capacity</td>
<td>The quantity that a factory can hold</td>
</tr>
<tr>
<td>Process</td>
<td>Business unit or function within a company</td>
</tr>
<tr>
<td>Market</td>
<td>Area where firms sell products or more generally the sector it belongs (Porter 1998)</td>
</tr>
<tr>
<td>Dairy industry</td>
<td>all players dealing with milk and its byproducts.</td>
</tr>
</tbody>
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CHAPTER ONE

INTRODUCTION

1.1 Background Information

Jachnik (2005) provides the following facts about the dairy industry. Between 1970 and 2004 world milk production grew from 392 million tonnes per year to 613 millions tonnes per year. In 2004, approximate milk consumption was 96 kgs per inhabitant showing a decline from 106 kg per inhabitant in 1970. Much of the milk is from the cow followed by buffalo. Between the same period, buffalo recorded the highest growth of milk production of 290% from 19.6 million tonnes to 75.9 millions tonnes per year. During the same period, cow milk production grew from 359.3 million tonnes to 515.8 million tonnes, an increase of 30.3%. Much of the total world milk production based on Dutch Dairy Board report (2003) was from European Union at 120 million tonnes followed by India and U.S.A. According to Dutch Dairy Board in 2002 European Union (15 countries) had 30% world dairy market shares followed by New Zealand 28%, Australia 18%, rest of Europe 11% Argentina and U.S.A at 4% each and others which includes Kenya controlled only 5%. Africa, near and Middle East as well as Far East (save for Oceania) are classified as areas of continued milk deficit.

In sub Africa, we have 21 kg per inhabitant well far below the world average. In Kenya we have per capita consumption of milk of 70 litres or less compared to the Food and Agriculture Organization (FAO) recommendation of 200 litres. The prevailing trends in the world market, are withdrawal of governments from direct interventions and product related subsidiaries, trade liberalization and promotion of dairy consumption in many countries.
According to Kenya Dairy Board, (2005) Kenya Dairy Industry supports over one million smallholder dairy households, and estimated over 365,000 waged jobs and over 500,000 jobs in support services. There are slightly over 3 million pure breed cattle and dairy crosses, 9 millions Zebus, 11 million goats and 800,000 camels that together produce an estimated 3.12 billion litres of milk per year. In 2004, about 270 million litres of milk was processed. Kenya Dairy Industry has 52 licensed processors out of which 34 are currently active. There are also small and micro enterprises involved in milk marketing providing nutrition and livelihood to a significant segment of the Kenyan population. This comprises of 84 mini dairies, 56 cottages industry, 841 milk bars and 350 producers. Karanja (2002), estimated milk demand in Kenya at 2.1 billion litres against a production of 2.5 billion litres per annum. 80% of the total milk output is sold through informal channels leaving only 20% for formal markets. According to Dairy mail (2005), a publication for the Dairy industry in Africa, Kenya has installed capacity of processing 2 million litres per day but only 30% of the capacity is utilized.

Omiti and Ouma (2000) noted that in 1992, the Kenya government liberalized the dairy industry. The effects of liberalization are the entry of new players thereby breaking the monopoly of KCC. According to Kenya Dairy Board (2005), there are 52 milk licensed milk processors out of which 34 are active. Omiti (2000) notes that with the newly liberalized markets, decontrolled prices and less government involvement the industry is at a crossroads. After liberalization, the market for raw milk previously unknown in urban areas grew rapidly at the expense of processed packaged milk. Heavy, competition between formal processors and the informal milk hawkers is now evident.
Schumpeter (1934) looks at innovation as “carrying out new combinations”. According to him innovation is the introduction of a new good, the introduction of a new method of production, opening of a new market, the opening of a new source of supply, and carrying out of the new organization if any. It is within this context that this project seeks to address innovation. The Dairy industry has witnessed tremendous changes after liberalization. This project addresses innovations adopted by milk processors in terms of new products, new flavours, new formulation, new packaging formats and new technology. All the above innovations are aimed at increasing market share among the competing processors and increasing per capita milk consumption.

1.2 Statement of the problem

According to Omiti (2000), the dairy industry was liberalized in 1992; there was entry of new milk processors breaking the monopoly of Kenya Co-operatives Creameries (K.C.C). As a result, competition set in among milk processing firms and also milk hawkers. Some firms have collapsed where as others have continued to grow. Daily Nation (7th March 2005) quotes, K.C.C chairman Mr. Matu Wamae reporting that K.C.C has secured a contract with U.N peace -keeping force to supply 500,000 litres in D.R.C. Like wise, Daily Nation (9th October 2005) quotes Brookside chairman Mr. Muhoho Kenyatta reporting that his company has established a 70,000 litres processing plant in Arusha –Tanzania and is now exporting milk to COMESA region. Daily Nation (27th November 2005) quotes Spin Knit Managing Director reporting that his company has acquired new technology with a capacity of processing additional 100,000 litres on daily basis. Daily Nation (18 February 2005) reported the removal of taxes on milk packaging materials. Daily Nation (18th January 2005) reported the collapse of Green land dairy and putting it under receivership. Also Limuru milk processor was reported to be on the verge of collapse. Kenya Times (1st...
April 2005) reported Premier dairies under receivership and unable to pay 18 million shillings to the farmers. According to Kenya Dairy Board (2005) Premier Dairy had a capacity of processing 100,000 litres. From the forgoing background, the main question are: Has innovation contributed to the success of the successful milk processing firms? or Has the lack of it contributed to the failure of the collapsed ones? This study therefore aims to investigate the contribution of new innovations to the growth of dairy industry (milk processing firms) in Kenya.

1.3 Objectives of the Study

1.3.1 Broad Objective

The broad objective for this study was to assess the contribution of new innovations to the growth of dairy industry in Kenya.

1.3.2 Specific objectives

The following were specific objectives of the study:

a) To identify new innovations in the dairy industry in Kenya.

b) To examine the factors that contributes to the growth of the Dairy industry in Kenya.

c) To assess the new markets penetrated by milk processors after new innovations.

d) To establish the gains or losses made by the milk processors as a result of the new innovations.

1.4 Research Questions

The following were research questions of the study:

a) Are there new innovations in the Dairy Industry?

b) What are the factors that contribute to the growth of dairy industry?
c) Are there new markets penetrated by milk processors as a result of new innovations?

d) Are there gains made by milk processors as a result of new innovation?

1.5 Importance of the study

This study will be importance to Kenya Dairy Board, the milk processing firms, farmers who supply milk and government for policy makers. Kenya Dairy Board plays a significance role in regulating milk production and marketing. The study will be important because it will create awareness on the various innovations in the dairy industry therefore giving the board an insight of the direction of the dairy industry in terms of innovations.

The consumers will know the existing products in the market and therefore increase their alternative in terms of product range. This will also boost per capita milk consumption from the current 72 litres to the recommended Food and Agricultural Organisation (FAO) recommendations of 200 litres.

Milk farmers will know the direction of dairy industry in terms of the existing market and as a result be able to make decisions on whether to increase or decrease output. The farmers will also be able to know more about dairy firms and therefore be able to know the existing opportunities of selling milk to the processing firms instead of being exploited by the informal middlemen.

The study will also be of great importance to the Milk processing firms since it will create awareness on the various innovations in the market. This will help the firms to develop strategies aimed at increasing their market share and as well as competitiveness in the market. Some of these strategies would include; acquiring of new technologies, new markets, enhancing their organization management, increasing
their product range and improving on the quality of their products. Through this study
the dairy firms will know more about the challenges which they are likely to face and
the opportunities which exists. For investors who are interested in investing in the
dairy industry they will know the opportunity that exists in the industry.

1.6 Scope and Limitation

The study covered dairy milk processing firms that are registered and operating in
Kenya. The study only covers cow milk because according to Kenya Dairy Board cow
milk is the common type of milk processed by the existing milk processors in Kenya.

The study suffered a number of limitations. Initially there was no enough money to
conduct the whole research process. Money was needed in paying transport cost,
preparing materials, data collection and in putting together the final report. To
overcome this limitation, the researcher secured some financial assistance from banks
and other financing institutions which enabled him to carry out the entire research
process.

In data collection, the researcher was faced by various challenges. This included
getting/tracing the dairy firms as well as convincing the respondents to fill in the
questionnaires. Some respondents were so busy with their office duties and hence
getting them to fill the questionnaire was not an easy task. To overcome this
limitation, the researcher sought help from the Kenya Dairy Board who provided with
the geographical location of all the targeted dairy firms. Once all target firms were
identified, the researcher booked interview appointment with the respondents. This
was necessary to avoid interfering with the busy programmes of the respondents.
2.0 Introduction

This chapter covers the relevant literature on innovation and dairy industry. The areas covered include; definition of innovation, sources of innovation, theories of innovation, why innovation is becoming more important, typical reasons for innovating, empirical studies done in the area of dairy industry, gaps in literature review and conceptual frame work. The aim of this chapter is to enable the researcher gain enough knowledge in innovation and the dairy industry.

2.1 Definition of Innovation

Innovation is a multi-faceted concept with no agreed on definition. It is associated with the development of a new product, process or idea. It is argued that invention is an extreme example of innovation. Innovation has been described as a new way of doing things. Innovation can be many things such as the distribution of a cheaper material in an existing product, or a better way of marketing an existing product or service, or even a better way of distributing or supporting an existing product or service.

Mintzberg, (1983) defines innovations as the ‘mean to break away from established patterns’ that are, doing things differently. To innovate according to Mintzberg, is to engage in divergent thinking aimed at innovation. Of utmost importance is that innovation must be linked to customer demand. This implies that innovation requires insight into customers and markets, what is possible and what is not possible and into how to make things happen (Burns, 2001)
Schumpeter (1934) concept of innovation, or “carrying out new combinations,” is the introduction of a new good, the introduction of a new method of production, the opening of a new market, the opening of a new source of supply, the carrying out of the new organization if any industry, like the creation of a monopoly.

Drucker’s (1985) definition is quite comprehensive. He believes that; Innovation is the specific tool of entrepreneurs, the means by which they exploit changes as an opportunity for a different business or a different service. It is capable of being presented as a discipline, capable of being learned and capable of being practiced. Entrepreneurs need to search purposefully for the sources of innovation, the changes and their symptoms that indicate opportunities for successive innovation. Drucker’s definition suggests that innovation can be practiced in a systematic manner. A business firm that systematically practice innovation search for change then carefully evaluates it’s potential from economic or social return.

2.2 Sources of Innovation

Drucker (1985) lists seven sources of innovation, four of which can be found within the organization itself and three others from the outside world. These sources are;

Sources from within the firm/industry in which the firm operates and includes the unexpected- be it the unexpected success or failure or the unexpected event, the incongruity-between what actually happens and what was supposed to happen, the inadequacy in underlying processes-That are taken for granted but can be improved or changed, the changes in industry or market structure-that take every one by surprise.

Sources from the outside world are; Demographic changes –population changes caused by changes in birth rates, wars, medical improvement and so on; Changes in perception, mood and meaning- that can be brought about by the ups and down of the
economy, cultural, fashion and so on; New knowledge—both scientific and non
scientific.

Porter (1998) believes that information plays a big role in the perceiving innovation
and contends that innovation usually emanates from the following sources; A new
company whose founder has non-traditional background or was simply not
appreciated in an older established company; Senior managers who are new to the
industry and thus more able to perceive opportunities and are bolder in pursuing them;
A company diversifying, thus bringing new resources, skill or perspective to another
industry; From another nation with different circumstances or ways of competing.

Porter stresses that most innovations emanate outside the traditional industry
participants who “may be less concerned with violating established norms or engaging
in un-seemingly competition”. He sees innovation as resulting from; Pressure,
Necessity and Adversity.

2.3 Innovation Processes

It is important to distinguish between an invention and an innovation. Spreadsheet
software is an invention. A new business application of spreadsheet that increases
profit is an innovation. An example of an innovation in government is submitting tax
returns to the revenue authority by Email instead of regular mail. Many current
innovations are the result of applying new technology in, Manufacturing and
Processing of business paperwork.

Empirically, better performance is not achieved by the new technology to improve the
performance of the old process. Rather, the manufacturing or paperwork process is
redesigned from ground up to make optimal use of the new combination of technology and people. A portion of the performance gain is from carefully analyzing the process to be replaced and asking what really to be done to maximize profits. In the media, this is the origin of the world “reorganization”

According to Christensen, innovation is either sustaining or disruptive. Sustaining innovation (SI) is typically seen as improved performance of existing products. It is incremental and safe. New and improved banners on cereal boxes and bathroom tissue come to mind. SI is the lifeblood of mature, slower growing markets. SI is conservative and risk averse.

Disruptive innovation (DI), on the other hand, creates new and conflicting value prepositions at all levels and forces competitors and consumers to make reactive decisions. Christensen identifies key characteristics of DI’S, which include the following: They emerge out of insignificant markets. They initially under-perform against established products. Few consumers want or think they need DI. DI lead to reduction in profit margins (within the old order). Disruptive innovation products (DIP’s) are initially harder to use or understand and seem clunky compared to the refined and fully sustaining innovation products (SIP’s) they compete against. Notable examples of DIP’s include the photocopier, the jet engine, computers and pretty much well managed and highly responsive to their customers’ wants and needs, often stumble and miss the paradigm shift brought on by DIP’s. The reasons appear to be found in the nature of innovation. Market leaders listen to customers who themselves do not want disruptive change and thus don’t demand from suppliers or customers.
2.4 Theories and Models of Innovation

2.4.1 The Rational Model of Innovation

Whether rational is subjective or objective, it implies that the decision making process is goal directed, manageable and controllable. Gold (1971) provides extensive evidence to suggest that there is a ‘synoptic model’ of innovation in which rationality of decision making constitutes the definitive theme. The synoptic model has four major building blocks. The belief that technological innovation is inherently attractive in corporations, particularly in the context of potential economic rewards; The belief that technological innovations are planned and controlled by management; The belief that decision-making is rational with built in evaluative feedback loops; The belief that research and development constitutes the most important means of effecting growth and profitability.

Influential proponent of the rational view include machlup (1962) who suggests that the process of invention has become systematic, rationalized and amendable to rational analysis and Schumpeter (1954) who states “it is easier now than it has been in the past to do things that lies outside familiar route.

Innovation itself is being reduced to routine. Technological processes is increasingly becoming the business of teams of trained specialists who turn out that is required and make it work in predictable ways. The romance of earlier commercial adventure is rapidly wearing away because so many things can be strictly calculated that had of old to be visualized in a flash of genius.
However, extensive empirical evidence is supplied by Jewkel et al (1969) and Langrish et al (1972). Sewkel et al concentrating on the invention stages of the innovation process, found about 60 cases studies that invention is extremely difficult to direct or control factors in technical process sand that are concerned. Langrish et al concerned with the total innovation process in 36 studies of Queen’s award winners, emphasizes the plurality of sources of innovation and the unreasonableness of using or adhering to the concept of a linear process of innovation development.

2.4.2 Conceptual Model of the Innovation process.

Price and Brass (1969) identified a conceptual model of the innovation process based on assumptions of rationality and linearity similar to those criticized by Gold and Scion and argue that for radical innovations the organizations which introduce them, must undergo major internal development and change, much of which cannot be programmed in advance. This has subsequently been supported through empirical research by a team from Illinois institute of technology (1968) and by Globe et al (1973) both of which found that non-mission-oriented research played an extremely important role in the development of selected major innovation.

The former study code named TRACES (1968) found that 70% of events considered important in leading to the obtaining of the five major innovations studied were non-mission oriented while Globe et al found that non-mission oriented research counted for 57% of significant events in the pre-innovative period, 16% of significant events during the innovative period and 10% during the post- innovation period.

2.4.3 The Neo-Classical Theory of the Firm.

The neo classical theory of the firm assumes that the decision-maker makes price, output and factor allocation decisions with perfect knowledge and foresight as to what
constitutes the relevant parameters of his cost and demand functions. Choices and allocation are made with the intention of maximizing profits. The theory specifies objectives rational behavior with respect to this goal.

In innovation this theory is of little use. Freeman (1974) suggests, the more that innovation is differential from the existing experience and knowledge of the firm, the greater the level of uncertainty typically associated with the project.

It appears that approximation to the condition of certain knowledge in neoclassical theory might be achieved only at the expense of trading of the definitive innovation characteristics of novelty and radicalness. Mansfield, one of the most prolific and influential of Economists in this era, in a discussion on the relevance of neoclassical theory to problems of technological change observes “with regard to many of the major issues concerning basic research, economies has little to say”.

2.4.4 The Behavioral Theories

a) The behavioral approach

The behavioral theory of the firm is a generic term describing the work of Cert and March (1963) and derived or related works. These in turn base a great deal of the development of their argument on previously developed concepts in particular the concepts of ‘level of aspiration’ first introduced into economic theory by Simon (1955). The firm learns the decision rules, actions and allocations, which have previously contributed to its goals of the firm, and in this manner adapt to its environment. Instead of maximizing specific decision variables, the concept of satisfying dictates search activity and the availability of alternative solutions to problems.
The 'aspiration level' is the datum switching search activity on and off, itself being dictated by circumstances and past performance, increasing rates of achievement tends to pull aspiration level upwards though at a lower rate while falls in performance tend to result in aspiration levels exceeding achievement.

Search activity is stimulated by a discrepancy between achievement and aspiration. If aspiration exceeds achievements search for a solution takes place until a satisfactory solution is obtained, cost of search not entering into decision making (Cyert and March 1963). Consistent with this theory of innovation in which the effective motivating mechanism is that current failure to achieve target levels; failure generate problematic search, which in-turns produces solutions, resulting in innovative activity.

However, Cyert and March (1963) recognizes that such an extension of the theory does not fit observed behaviour well, citing Mansfield (1961) as evidence. Firms do innovate and innovate extremely, when they are successful and the concept of problematic search is unable to explain this. They therefore also utilize the concept of organizational slack in their analysis of innovation. Organizational slack permits the allocation of resources to subunits, and the development of project that have strong subunit support. Success allows the firm to sanction projects that would not be tolerated in conditions of scarcity. The motivating mechanism is the contribution of slack is dependent on the strength of the submit demand and influence.

Cyert and March (1963) do not include any form of technological change as an organizational goal. Their model explicitly recognizes goals capable of formulation in short run terms, such as profits and sales.
B) Penrose’s Theory of the Growth of the Firm

Penrose’s (1959) developed an approach, which has similarities to behavioral theory, but is critically different in a number of important respects. Penrose takes the point of view that growth results from the pursuit of economies and opportunities that ‘disappeared’ once the expansion has been achieved. According to Penrose (1959) “Economies of growth are the internal economies available to an individual firm which make expansion profitable in particular directions. They are derived from the unique collection of productive services available to it, and create for those firms a differential advantage over other firms in putting on the market new products or increased quantities of old products. At any time the availability of such economies is the result of the process by which unused productive services are continually created within the firm.

Unused or residual managerial resources therefore constitutes the means by which opportunities for growth are exploited since they provide excess managerial services, excess being defined as the amount over and above that required to manage the firm in its current operations. In both approaches recognition of the importance of technological change is expressed, and both Cyert and March (1963), and Penrose (1959), attempt to account for resource allocation to innovative activity within their respective theoretical framework.

2.4.5 General System Theory

General System theory is concerned with ‘general aspects, correspondences and isomorphism’s common to’ systems’ (Bertalanfly 1973). System consists of sets of element standing in interrelation. A fundamental precept of general system theory is that of hierarchical order; for example systems themselves may be organized into
hierarchies, corporations may be regarded as elements in an industry e.g. research and development (innovation) marketing production etc. These elements are interpretable as systems in their own rights or sub-systems in the corporation systems.

General system theory is to some extent a misnomer. It is not a testable theory or set of hypothesis as such but is instead a framework or meta-theory within which can be set at lower-level hypotheses. All the above models and theories have been formulated to explain why firms carry out innovation. Different proponents of the above theories have different views of why firms engage in innovation. There is no specific reason or reasons why firms engage in innovation but there are a variety of reasons. Some says it is failure where as other says that success encourages Innovation.

2.5 Why Innovation is Becoming more Important.

The following are some of the reasons why innovation is becoming important. Technology is changing fast, new products come from new competitors, fast changing environment, products lifetimes shorter, need to replace products sooner, Products are increasing difficult to differentiate, Customers are some sophisticated, segmented and demanding, and expect more in terms of customization, newness, quality and price. Customers have more choice, and good ideas quickly copied, there is continual pressure to devise new products and better products, processes and services faster.

2.6 Typical Reasons for Innovating

The following are some of the reasons why business should innovate. These include responding to customers, increasing market share, being at the forefront of industry, establishing a new market, improving the quality and speed of service, expanding the
Some of the effects to the business for failure to innovate includes; customers stop buying products, processes and services; revenues drop; shareholder returns drop; Stock price drops; key employees leave; more customers stop buying your products, processes and services; sales drop.

Although companies are aware of the consequences for failure to innovate, there are reasons why they fail to do so. Some of these reasons are innovation is a long-term activity (failure to maintain interest), innovation has a long payback period, innovation is expensive (failure to continue to invest), innovation is too complex to manage, everyone's overloaded with everyday problems, competing priorities, management systems can't handle innovation, innovation costs are too hard to control, necessity - the mother of invention, market pressure, brainstorming sessions, employee suggestion box, laboratory research, literature search, copy and improve, competitor's products, copy the process used to develop past innovations, benefit from weakness of time for innovation, traditional innovation management behavior, management desire to be control prevents people being creative, middle managers prevent innovations getting top-level visibility, poor leadership style, maintaining traditional ways of thinking, intolerance of fanatics wanting to change the world, excessive rules, constraints and bureaucracy, unwillingness to change a winning formula, resistance to change, excessive demands to produce lengthy written reports, no free time allowed for new ideas, new approaches to innovation management, virtual prototyping, implementing a knowledge management system, rapid
prototyping and market experimentation, hire the finest, import external innovators, distributed network of experts, offer everyone a venture planning toolkit and set up a venture finance team.

2.7 Empirical Studies

Much of the past studies is in the area of animal science, dairy co-operative societies, Smallholder dairy, Dairy Consumption, Dairy development, Kenya Dairy Sub sector appraisal and the Dairy industry in Kenya after liberalization and the Dairy industry in Kenya after liberalization.

Innovation is captured on the international Dairy magazines and journals. A case in point is the newly launched international magazine “Innovation” published by Zenith International Publishing Ltd. The magazine is published six times a year (after every two months) and high lights new innovations in the dairy industry in Europe, North America, Asia, Pacific, Middle East, Australia and the rest of the world in general. This publication captures innovations in terms of new products, new packaging and new technology. Also, school milk consumption programs aimed at cultivating milk consumption among school going children has been given preference.

Karanja (2002) covered milk production, animal genetics, milk marketing, import and export of dairy products, Dairy export strategy and policy issues and the way forward. Milk production was noted to have stagnated at around 2.5 billions per annum. Milk demand was estimated to grow at 3.6% per annum in the next six years. per capita milk consumption in the country was around 72 litres while per capita production was about 82 litres. The result of the study indicated that yields realized in smallholder open grazing farms are the lowest as compared to milk yields in other systems which
averages at 1510 litres per cow per year. This yield is 28.8% and 46% lower than the average yield in small scale zero grazing and large scale open grazing systems respectively. In animal genetics, the study results indicated that only 17% of the small holders farms are currently using AI in the country. 23% own bulls while 61% are using hired bulls. The number of inseminations has declined by 76% in the last 10 years. Cost of insemination using local semen average Ksh 600 while that of imported semen average Ksh 1200. The imported semen was estimated to have a market share of 22%.

Milk marketing result were 80% of milk produced by smallholder farms end in informal milk outlets. Milk prices in the informal markets are 22% higher than in the formal marketing channel. By 2001 only 152 million litres of milk was processed, a decline of 58% compared to 350 million litres in 1992. Only 22% of the installed milk processing capacity was currently in use. Estimated milk processing cost by year 2002 was 57% of the price paid per litre by the consumers. The cost of packaging materials remains one of the major concerns.

Dairy export strategy shows that Kenya has the largest potential to export dairy products having the largest and well-developed dairy herd in sub-Saharan Africa. On policy issues and the way forward the study identified a number of policy and institutional issues that needed to be addressed. These includes measures to enhance productivity and competitiveness of dairy production, the energy structure of dairy processing industry and its implication on efficiency, marketing costs consumer prices and international trade, formulations of dairy export strategy to expand milk markets and reforms of the Kenya Dairy Board to play a more developments role.
Stall and Mullions (1996) Dairy consumption and its determinants in coastal Kenya a collaborative research project by Kenya Agricultural research Institute (KARI) and International Livestock Research Institute the study noted a deficit in dairy industry. Dairy industry task force recommendations (2001) in their study made similar observations to those of Karanja (2002) discussed above. Muriuki and Omore (2000), they examined various challenges facing smallholder dairy farmers.

Omore and Muriuki (1999), the report gives a brief history of the dairy industry in Kenya and its uniqueness in the East Africa region. They also give their findings in milk marketing and consumption. They have also examined Dairy production systems and institutional and policy issues.

The first strategic plan of the Kenya Dairy Board, since it was established in 1958 under the Dairy industry act was published in 2005. According to Kenya Dairy Board (2005), there are 52 licensed processors out of which 34 are currently active. There are also small and micro-enterprises involved in milk Marketing providing nutrition and livelihoods to a significant segment of the Kenya population. This comprises of 84 mini-dairies, 56 cottage industry, 841 milk bars and 350 producers. Milk production is 3.12 billion litres per year valued at around Ksh.50 billions out of which milk worth ksh. 35 billion equivalent to 2.2 litres is marketed. The Dairy Industry contributes to 3% of Kenya’s gross domestic product (GDP). It provides livelihood to One million smallholders Dairy households and generally estimated 365,000-waged jobs in addition to the family labour involved.
2.8 Gap in Literature Review

Karanja (2000) covered the area of milk production, animal genetics and milk marketing. In the area of marketing his studies concentrated in market share between the informal sector and the formal sector. There was no mention on how new milk processing firms are sharing the market. Stall and Mullion (1996) did a study concerning the dairy consumption and its determinant in Coast region. Dairy Task Force (2001) made their recommendations based on the study done by Karanja above. Muriuki and Stalls (2000) examined various challenges facing smallholder dairy farmers. Omone and Kenyanjui (1999) wrote on the dairy in Kenya. Omiti (2000) study was in the area of impacts of liberalization in Kenya’s dairy sector. He covered areas in impact on milk prices, accessibility and cost of breeding services, availability and quality of manufactured feeds, impacts on dairy research and extension, impacts on milk processing, impact on milk traders, challenges and opportunities on strengthening farmers’ organization.

The above are various studies done in the area of dairy industry and shows that very little study has been done in the area of innovation in the dairy industry in Kenya. This study sought to fill this gap by exploring the contribution of new innovations in milk processing firms in Kenya after liberalization.

2.9 Conceptual Framework

There are independent variables, intervening variables and dependent variables. Independent variables include market demand, new dairy products, new technology, new management styles, sources of finance, type of animal breeds, sources of animal feeds. There are intervening variables that include political factors like taxation and
other government registrations, economic factors like inflation and competition, climatic conditions, infrastructure and diseases. Dependent variable is the growth of dairy industry and indicators of growth includes; Volume of milk, market share, level of technology, number of employees, number of dairy cows and increase in turnover.

**Figure 2.1: Conceptual Framework Diagram**

**Independent variables**
- Market demand
- New products
- New technology
- New management styles
- Sources of finance
- Types of animal feeds

Contributes to

**Dependent variables**
- Growth of Dairy industry
  - Volume of processed milk
  - Level of technology
  - No. of employees
  - No. of dairy farmers
  - No of Assets

**Intervening variables**
- Economic factors
- Political factors
- Infrastructure
- Diseases
- Climatic factors

(Source: Researcher 2007)
CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter describes the methodology that was used in the study. The chapter covers the following sections: research design, target population, sampling procedure, data collection instruments and procedures and data analysis.

3.1 Research Design

According to Mugenda and Mugenda (2003), a research design guides the research in collecting, analyzing and interpreting observed facts. The design that was used in the study was descriptive research design. This design was used because it determines and reports the ways things are at present (Kothari, 2003). This approach was appropriate for this study because the study involved facts finding and enquiries of different kinds to establish the contribution of innovations in the dairy industry in Kenya at present. Data was collected to help answer the research questions of the study.

3.2 Target Population

Mugenda and Mugenda (2003) defined target population as that population to which a researcher wish to generalize the result of the study. The target population for this study comprised of all operations managers of 34 registered and operational milk processing firms in Kenya. According to Kenya Dairy Board there are 52 registered dairy firms in Kenya but only 34 firms are operational. Therefore, the study targeted the 34 operational firms. (See appendix three for the list of the targeted dairy firms in Kenya).
3.3 Sampling Procedure

According to Kenya Dairy board (2005), there are 52 registered milk processing firms in Kenya but only 34 firms are operational. Since the target population is small, the researcher conducted a census on all the 34 registered and dairy firms in Kenya. A questionnaire was prepared and administered to all the 34 milk processing firms.

3.4 Data Collection Instruments and Procedures

The researcher employed questionnaire method for Data collection. A questionnaire that targets operation managers was prepared and administered to all the 34 milk-processing firms. The questionnaire consisted of closed and open ended questions. Questionnaires were used because they are cheap and easy to administer to respondents scattered over a large area and convenient for collecting information from a large population within a short period of time (Onyango and Plews, 1999). The Questionnaires were sent through post to the milk processing firms outside Nairobi. The firms within Nairobi and its environment were interviewed by the researcher personally. The above instrument was prepared well in advance before the exercise commenced. The questionnaire was pre-tested before the actual use. This was to test its validity and reliability before the commencement of data collection exercise.

3.5 Data Analysis

Analysis of data included sorting, cleaning and organization of data from the field questionnaires. The information was then coded and entered into a spreadsheet and analyzed using SPSS (Statistical Package for Social Sciences). The data was analyzed using both qualitative and quantitative techniques. The open ended sections of the questionnaire were analyzed using qualitative method while the closed ended questions on the questionnaires were analyzed through the use of quantitative
techniques such as frequencies, percentages, multiple response analysis among others. Qualitative data was cleaned and sorted into specific codes. The codes were then segregated according to research questions and objectives for similarities and differences. The data was then grouped in themes from which conclusions were drawn. The data was presented using pie chart, bar graphs, percentages, frequency tables among others.
CHAPTER FOUR
DATA ANALYSIS AND PRESENTATION

4.1 Introduction

The purpose of this study was to investigate the contribution of new innovations in the growth of dairy industry in Kenya. The chapter contains analysis of the data and presentation of the findings. The study targeted all the 52 registered dairy firms but according to Kenya Dairy Board (2005), only 34 firms were operational. However, the study however established that despite the fact that there were 34 operational dairy firms according to Kenya Dairy Board, only 26 dairy firms were operational in Kenya during the time of field work. Eight dairy firms had closed down their operation. Out of the 26 dairy firms, the researcher successfully interviewed a total of 21 dairy firms which represented 80.8% response rate. This formed the basis for the analysis presented in this chapter. The data is presented in form of frequency tables, pie-charts, and percentages where applicable.

Table 4.1: Summary of the Collected Data

<table>
<thead>
<tr>
<th>Status</th>
<th>Dairy firms</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Returned questionnaires</td>
<td>21</td>
<td>80.8%</td>
</tr>
<tr>
<td>Missing Responses</td>
<td>5</td>
<td>19.2%</td>
</tr>
<tr>
<td>Sub-Total</td>
<td>26</td>
<td>100</td>
</tr>
<tr>
<td>Non-operational Firms</td>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td>Grand total</td>
<td>34</td>
<td>-</td>
</tr>
</tbody>
</table>

4.2 New Innovations in the Dairy Industry

Table 4.2 shows the new Innovations in the dairy industry ranked in the order of importance. The study identified the new innovations in the dairy industry which
included; new product, new markets, new packaging, new management and new technology. In terms of the level of importance, new packaging was ranked as the most important innovation in the dairy industry as accounted for by 93.3% (very important and important) cumulative responses. This was followed by new markets, new product, new technology and new management as accounted for by 81.9%, 75.1%, 61.6% and 60% cumulative responses respectively. This is shown in table 4.2. This implies that the top three most important innovations in the dairy industry in Kenya included; new packaging, new markets and new product.

**Table 4.2: New Innovations**

<table>
<thead>
<tr>
<th>New Innovations</th>
<th>Very important (%)</th>
<th>Important (%)</th>
<th>Less important (%)</th>
<th>Not important (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>New product</td>
<td>56.3</td>
<td>18.8</td>
<td>18.8%</td>
<td>6.3</td>
</tr>
<tr>
<td>New markets</td>
<td>36.4</td>
<td>45.5</td>
<td>18.2%</td>
<td>.0</td>
</tr>
<tr>
<td>New packaging</td>
<td>73.3</td>
<td>20.0</td>
<td>6.7%</td>
<td>.0</td>
</tr>
<tr>
<td>New technology</td>
<td>46.2</td>
<td>15.4</td>
<td>30.8%</td>
<td>7.7</td>
</tr>
<tr>
<td>New management</td>
<td>60.0</td>
<td>.0</td>
<td>20.0%</td>
<td>20.0</td>
</tr>
</tbody>
</table>

4.3 Factors Contributing to the growth of Dairy Industry

The respondents highlighted the various factors that have contributing to the growth of Dairy Industry. The factors were also ranked in terms of the level of importance. The factors that were found to contribute to growth of the dairy industry included; market demand, new packaging, management style, sources of finances and new technology. In terms of the level of importance, new packaging and management style were ranked as the most important factor to have contributing greatly to the growth of Dairy Industry. These two factors accounted for by 100% each (very important and important) cumulative responses. These were closely followed by market demand
(93.8%), new Technology (84.6%), and finally sources of finances (60%) as shown in table 4.3. This implies that new packaging and management style were the major factors that contributed greatly to the growth of Dairy Industry.

**Table 4.3: Factors contributing to the growth of Dairy Industry**

<table>
<thead>
<tr>
<th>Factors</th>
<th>very important (%)</th>
<th>Important (%)</th>
<th>Less important (%)</th>
<th>Not important (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Demand</td>
<td>75.0</td>
<td>18.8</td>
<td>-</td>
<td>6.3</td>
</tr>
<tr>
<td>New Technology</td>
<td>76.9</td>
<td>7.7</td>
<td>15.4</td>
<td>-</td>
</tr>
<tr>
<td>Management style</td>
<td>83.3</td>
<td>16.7</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sources of finances</td>
<td>20.0</td>
<td>40.0</td>
<td>-</td>
<td>40.0</td>
</tr>
<tr>
<td>New Packaging</td>
<td>75.0</td>
<td>25.0</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

4.4 Growth of Dairy Industry as a result of New Innovations

4.4.1 Dairy industry growth in the last three years

The respondents were asked to state whether their respective Dairy firm had registered significant growth in the last three years. The findings show that 81% of the dairy firms had grown significantly in the last three years while 19% of the firm had not registered significant growth in the last three years as shown in figure 4.1. On the parameter that were used to measure growth in the dairy firms, majority (73.7%) of the firm used the volume of the milk produced in the last three years. Increase in employees and assets were only used by 10.5% of the firm while the rest used level of technology to measure growth. This is shown in figure 4.2. This implies that most Dairy firms in Kenya had registered significant growth in the last three years. This growth was mostly attributed to increase in milk production.
**Figure 4.1: Dairy firm growth in the last 3 years**

Dairy firm growth in the last 3 years

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>Yes (51)</td>
</tr>
<tr>
<td>20</td>
<td>No (19)</td>
</tr>
</tbody>
</table>

The diagram illustrates the percentage of dairy firms that have experienced growth in the last 3 years. Out of 51 responding firms, 32 reported growth in sales, while 19 did not. This suggests a positive trend in the dairy industry.
Figure 4.2: Parameters to measure growth in Dairy Firms

<table>
<thead>
<tr>
<th>Growth measurement Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased Employees</td>
</tr>
<tr>
<td>Level of Technology</td>
</tr>
<tr>
<td>Increase Assets</td>
</tr>
<tr>
<td>Increase in Milk</td>
</tr>
</tbody>
</table>

4.4.2 Sales Improvement in Dairy firms

The study sought to establish whether the improvement in sales in the dairy firms was as a result of the various innovations in the dairy industry. According to 95.2% of the respondents, significant improvement in sales in the dairy firms was as a result of the new innovations in dairy industry. 4.8% of the respondents did not attribute significant improvement in sales to new innovation as shown in table 4.4. This implies that new innovations played a key role in sale promotion which as a consequence has led to overall growth of the dairy firms.
Table 4.4: Whether the sales improved as a result of innovations

<table>
<thead>
<tr>
<th>Responses</th>
<th>Number (n)</th>
<th>Percentage (%)</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>20</td>
<td>95.2</td>
<td>95.2</td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td>4.8</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

4.4.3 Percentage growth in sales

The study sought to establish the percentage growth in sales of the various dairy firms in Kenya in the last three years. The study established that majority (76.2%) of the interviewed dairy firms had registered over 30% of growth in sales while 14.3% of the firms had registered below 10% growth. 9.5% of the dairy firms had registered between 11-20% growths in the last three years. This is shown in figure 4.3. This implies that there has been remarkable growth in sales in the dairy industry which was attributed to new innovations that were introduced in the industry.

Figure 4.3: Percentage growth in sales
4.5 Benefits of Innovation in the Dairy Industry

The study sought to establish the benefits derived from innovation and the level at which these benefits were ranked by the respondents. A four-point likert scale comprising of high, average, low and none was used and the results were as shown in table 2.5. The respondents ranked the level of benefits derived from innovation. The findings show that increased profits, satisfied customers, increased turnover and increased product range were ranked high by majority of the respondents as accounted for by 88.9%, 83.3%, 82.4% and 50.0% respectively. Non of the respondents ranked 'increased profits, satisfied customers and increased turnover' as of low benefit but 12.5% of the respondents ranked 'increased product range' as of low benefit to the dairy firms. This is shown in table 4.5. This implies that increased profits, satisfied customers and increased turnover were the major benefit of new innovations in the dairy industry. These have contributed greatly to the growth of the dairy firms.

**Table 4.5: Benefits of Innovation**

<table>
<thead>
<tr>
<th>Benefits</th>
<th>High  %</th>
<th>Average %</th>
<th>Low  %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased profits</td>
<td>88.9%</td>
<td>11.1%</td>
<td></td>
</tr>
<tr>
<td>Increased turnover</td>
<td>82.4%</td>
<td>17.6%</td>
<td></td>
</tr>
<tr>
<td>Satisfied customers</td>
<td>83.3%</td>
<td>16.7%</td>
<td></td>
</tr>
<tr>
<td>Increased product range</td>
<td>50.0%</td>
<td>37.5%</td>
<td>12.5%</td>
</tr>
</tbody>
</table>
4.6 Challenges Facing Dairy Industry

The various challenges that face the efficiency of milk production and sales in the dairy firms were identified and ranked in terms of how often they affect the operations of the dairy firms. The study established that competition was a major challenge that was found to always affect the operations the dairy firms as accounted for by 89.5% (always response). Other challenges that sometimes affected the efficiency of milk production and sales included; inadequate finance (62.5%), high operation cost (72.2%), Theft (80%), Sales returned (61.5%), Machine breakdown (58.3%), Animal diseases (60%) and Droughts (80%). This is shown in table 4.6. The respondents suggested the various ways on how to overcome these challenges. These included; employment of committed staff, improving the quality of products, ensuring better breed of cattle, provision of clean and safe water for both the farmers and the livestock by the government, Processing milk that the firm can be able to sell in a highly competitive market, Securing finances from members and other lending institution, Installation of a cooling plant to reduce milk wastage, enhancing the security personnel to prevent theft, motivating and enhancing training of the sales team and encourage farmers to seek medical attention for their animals regularly. If all these mitigation measures are put in place, they would greatly help to boast the firm’s output in terms of production and sales.
Table 4.6: Challenges facing Efficiency of Milk Production and Sales

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Always %</th>
<th>Sometimes %</th>
<th>Hardly %</th>
<th>Never %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate finance</td>
<td>6.3</td>
<td>62.5</td>
<td>31.3</td>
<td></td>
</tr>
<tr>
<td>High operation cost</td>
<td>11.1</td>
<td>72.2</td>
<td>16.7</td>
<td></td>
</tr>
<tr>
<td>Theft</td>
<td>6.7</td>
<td>80.0</td>
<td>13.3</td>
<td></td>
</tr>
<tr>
<td>Competition</td>
<td>89.5</td>
<td>10.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sales returned</td>
<td>23.1</td>
<td>61.5</td>
<td>15.4</td>
<td></td>
</tr>
<tr>
<td>Machine breakdown</td>
<td>16.7</td>
<td>58.3</td>
<td>25.0</td>
<td></td>
</tr>
<tr>
<td>Animal diseases</td>
<td>20.0</td>
<td>60.0</td>
<td></td>
<td>20.0</td>
</tr>
<tr>
<td>Droughts</td>
<td>20.0</td>
<td>80.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.7 Products Introduced in the Market in the Last Three Years

Table 4.7 shows the multiple responses analysis of the new products introduced in the market in the last three years. Among the new products introduced in the market in the last three years by all the interviewed dairy firms included; Sachet milk, TC milk, Tetra fino, Butter, Yogurts, Ghee, Long life milk, Mala and TR fresh. This implies that there has been a high market penetration of dairy product in the last three years which has been necessitated by the many innovations in the dairy industry. Through the multiple response analysis, study however found out that DCL milk, flavored long life milk and powdered milk were not among the products introduced in the market in the last three years as shown in table 4.7.
Table 4.7: Multiple Response Analysis of New products in the Market

<table>
<thead>
<tr>
<th>New Products in the Market</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sachet milk</td>
<td>100.0%</td>
</tr>
<tr>
<td>TC milk</td>
<td>100.0%</td>
</tr>
<tr>
<td>Tetra fino</td>
<td>100.0%</td>
</tr>
<tr>
<td>DCL milk</td>
<td>0</td>
</tr>
<tr>
<td>Flavored long life milk</td>
<td>0</td>
</tr>
<tr>
<td>Butter</td>
<td>100.0%</td>
</tr>
<tr>
<td>Yogurts</td>
<td>100.0%</td>
</tr>
<tr>
<td>Ghee</td>
<td>100.0%</td>
</tr>
<tr>
<td>Long life milk</td>
<td>100.0%</td>
</tr>
<tr>
<td>Powdered milk</td>
<td>0</td>
</tr>
<tr>
<td>Mala</td>
<td>100.0%</td>
</tr>
<tr>
<td>TR fresh</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

4.8 Summary of the Findings

The study aimed at establishing the contribution of new innovations in the growth of dairy industry in Kenya. The study identified the new innovations in the dairy industry which included new product, new markets, new packaging, new management and new technology. In terms of the level of importance, new packaging was ranked as the most important innovation in the dairy industry (93.3%). This was followed by new markets (81.9%), new product (75.1%), new technology (61.6%) and new management (60%).

The findings showed that most of the dairy firms (81%) had registered a significant growth in the last three years. This was attributed to many innovations that had been
initiated in the industry. The study also established a significant improvement (95.2%) in sales in the dairy firms. Majority (76.2%) of the dairy firms had registered over 30% of growth in sales. This remarkable growth in sales in the dairy industry was attributed to new innovations introduced in the industry.

The study established through the multiple responses analysis the new products introduced in the market in the last three years. Among the new products introduced in the market in the last three years included; Sachet milk, TC milk, Tetra fino, Butter, Yogurts, Ghee, Long life milk, Mala and TR fresh. The study found a high market penetration of dairy product in the last three years. This was attributed to the many innovations in the dairy industry.
CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The factors that contributed to growth of the dairy industry were found to be; market demand, new packaging, management style, sources of finances and new technology. In terms of the level of importance, new packaging and management style were found to be the most important factor. The study identified new innovation adopted in the dairy industry in the last three years. These included; new product, new markets, new packaging, new management and new technology. The study also established that the benefits derived from innovation in the dairy industry included; increased profits, satisfied customers, increased turnover and increased product range.

The study established that competition was a major challenge that always affected the operations of the dairy firms. Other challenges that affect the efficiency of milk production and sales included; inadequate finance, high operation cost, theft sales returned, machine breakdown, animal diseases and droughts. The study established the various ways of mitigating /overcoming the identified challenges. These included; employment of committed staff, improving the quality of products, ensuring better breed of cattle, government to provide clean and safe water for both the farmers and the livestock, processing milk that the firm can be able to sell in a highly competitive market, securing finances from members and other lending institution, installation of a cooling plant to reduce milk wastage, enhancing the security personnel to prevent theft, motivating and enhancing training of the sales team and encourage farmers to
seek medical attention for their animals regularly. All these will be geared towards high firm output mostly on production and sales.

5.2 Recommendations

The study recommends that the prices for dairy products be fixed and be regulated by government body. This will prevent big and well established firms from undercutting small and upcoming ones. There is need for a national policy on standards governing the industry from the farm level to finished products. This will ensure that the product that finally lands on the market is clean and up to standard for consumer use.

Dairy industry needs to be managed not monitored, government does not need to be an interested party in production but can play a role of marketing the products of the finished products. The government needs to play a significant role of ensuring that the dairy firms are well supplied with good and efficient infrastructure. This will save on cost of production and hence make the product affordable to the consumers.

The study also recommends that Kenya Bureau of standards be more empowered to ensure efficient control of milk and other dairy product quality. This will be more important for consumer protection. More education and training is essential to farmers especially on maintaining healthy livestock. This will ensure increase in milk yields and hygiene.

5.3 Suggestions for Further Research

The researcher noted with a lot of concern that there had been a declining trends in the number of the operational daily firms in the country. Out of the 52 registered dairy firms at the end of the year 2005, only 26 daily firms were operational at the time of
this study. The other dairy firms had closed down their operation. Therefore future studies should focus on establishing the cause of this rapid closer of the dairy firms and come up with recommendation on how to make the dairy firms more competitive in the market as well as self sustaining.
REFERENCES


Morris, Timothy.(1986) -Innovations in banking : London Macmillan


Appendix One: Questionnaire Introduction Letter

Dear Respondent,

I am a Master of Business Administration (MBA) student at Kenyatta University. As partial fulfillment for the award of MBA, one is required to carry out a research project. I am doing a research project on contributions of innovations in the growth of Dairy industry in Kenya. All information is solely for this project and will be treated in confidence.

Yours faithfully,

ZACHARY KIMANI
MBA STUDENT KENYATTA UNIVERSITY
Appendix Two: Questionnaire

Please assist in filling the questionnaire below.

Company Name--------------------------------------------

Date when your company was incorporated----------------

1) What are the new innovations in your firm? Please rank and tick.

<table>
<thead>
<tr>
<th></th>
<th>Very important</th>
<th>Important</th>
<th>Less important</th>
<th>Not Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Product</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New markets</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New packaging</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New technology</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New management</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others specify</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2) For the innovations ranked very important above explain why?

__________________________________________________________________________
__________________________________________________________________________

3) For the innovations ranked not important, please explain why?

__________________________________________________________________________

4) As a result of innovations above, has your sales improved?
   - Yes
   - No

5) If the answer is Yes, above, what is the percentage growth of sales?
   - Below 10%
   - Between 11–20%
   - Between 21–30%
   - Over 30%

6) Do you think your Dairy firm has grown significantly in the last 3 years?
   - Yes

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7) If yes above, how do you measure growth in your business?
   - No of employees have increased
   - Assets have increased
   - Volume of milk has gone up
   - Level of Technology
   - No. of Dairy farmers has increased
   - No. of Dairy cows
   Any other specify

8) Rank the factors that have contributed to the growth of your firm

<table>
<thead>
<tr>
<th>Factor</th>
<th>Very important</th>
<th>Important</th>
<th>Less Important</th>
<th>Not Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market demand</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Technology</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management Style</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sources of finances</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New packaging</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any other specify</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9) For the factors marked very important above in no.8, please explain

10) For the factors marked not important in no.8, please explain why?

11) Please tick the products you have introduced in the market for the last 3 years
   - Sachet milk
   - TC milk
   - Tetra fino
   - DCL milk
   - Flavoured long life milk
   - Butter
Yogurts
Ghee
Long life milk
Powdered Milk
Mala
TR fresh

Others specify

12) Where do you sell your products?
- District only
- Province only
- National (Kenya)
- East Africa
- Others specify

13) If your Dairy average is below the capacity, please explain what causes the deficit

14) Have you introduced new packaging or changed your packaging of various products in the last 3 years?
- Yes
- No

15) Please rank the benefits you have derived from innovation

<table>
<thead>
<tr>
<th></th>
<th>High</th>
<th>Average</th>
<th>Low</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased Profits</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased Turnover</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfied customers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased product range</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any other specify</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
16) Which of the following challenges affect your efficiency in milk production and sales please rank

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Always</th>
<th>Sometimes</th>
<th>Hardly</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate finance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High operation cost</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Theft</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sales returned</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machine breakdown</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animal diseases</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Droughts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

17) Explain briefly how you overcome these challenges

18) Comment on how you would like the Dairy industry improved
Appendix Three: List of Players in the Dairy Industry

<table>
<thead>
<tr>
<th>No.</th>
<th>Processor</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>KCC</td>
<td>Nationwide</td>
</tr>
<tr>
<td>2</td>
<td>Brookside</td>
<td>Thika/Ruiru</td>
</tr>
<tr>
<td>3</td>
<td>Premier Dairy</td>
<td>Kericho</td>
</tr>
<tr>
<td>4</td>
<td>Sin Knit Dairy Div</td>
<td>Nakuru/Nairobi</td>
</tr>
<tr>
<td>5</td>
<td>Meru Central Dairy</td>
<td>Meru</td>
</tr>
<tr>
<td>6</td>
<td>Limuru Milk Processors</td>
<td>Kiambu</td>
</tr>
<tr>
<td>7</td>
<td>Kilifi Plantation</td>
<td>Kilifi</td>
</tr>
<tr>
<td>8</td>
<td>Lelkina Dairy</td>
<td>Molo/Nakuru</td>
</tr>
<tr>
<td>9</td>
<td>Aberdare Creameries</td>
<td>North Kinangop</td>
</tr>
<tr>
<td>10</td>
<td>Donyo Lessos</td>
<td>Eldoret</td>
</tr>
<tr>
<td>11</td>
<td>Delamere</td>
<td>Naivasha</td>
</tr>
<tr>
<td>12</td>
<td>Nyota Dairy</td>
<td>Kitale/Trans-Nzoia</td>
</tr>
<tr>
<td>13</td>
<td>Kenya milk Products</td>
<td>Nakuru</td>
</tr>
<tr>
<td>14</td>
<td>Ilare Dairy</td>
<td>Rongai/Nakuru</td>
</tr>
<tr>
<td>15</td>
<td>Sotik Dairy</td>
<td>Kericho</td>
</tr>
<tr>
<td>16</td>
<td>Guilford Institute</td>
<td>Njoro</td>
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<tr>
<td>17</td>
<td>Eldoville Farm</td>
<td>Nairobi</td>
</tr>
<tr>
<td>18</td>
<td>Sotik Dairy</td>
<td>Kericho</td>
</tr>
<tr>
<td>19</td>
<td>Happy Cow</td>
<td>Nairobi</td>
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<tr>
<td>20</td>
<td>Palm House Dairy</td>
<td>Kiambu</td>
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<tr>
<td>21</td>
<td>Unigate Dairy</td>
<td>Nairobi</td>
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<tr>
<td>22</td>
<td>Echuka Farm</td>
<td>Kiambu</td>
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<tr>
<td>23</td>
<td>Eldairy Products Ltd</td>
<td>Eldoret</td>
</tr>
<tr>
<td>24</td>
<td>Teita Estate</td>
<td>Mwatate</td>
</tr>
<tr>
<td>25</td>
<td>Solai Mawa Factory</td>
<td>Solai/Nakuru</td>
</tr>
<tr>
<td>26</td>
<td>Aberdare Cheese</td>
<td>Naivasha</td>
</tr>
<tr>
<td>27</td>
<td>Sunpower Products Ltd</td>
<td>Kiambu</td>
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<tr>
<td>28</td>
<td>Bio-Foods</td>
<td>Nairobi</td>
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<tr>
<td>29</td>
<td>Stanley and Sons Ltd</td>
<td>Machakos</td>
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<tr>
<td>30</td>
<td>Kiambaa Dairy</td>
<td>Kiambu</td>
</tr>
<tr>
<td>31</td>
<td>Farm fresh</td>
<td>Nairobi</td>
</tr>
<tr>
<td>32</td>
<td>Danoma Ltd</td>
<td>Mombasa</td>
</tr>
<tr>
<td>33</td>
<td>Supa Duka</td>
<td>Nakuru</td>
</tr>
<tr>
<td>34</td>
<td>Crystal Dairy</td>
<td>Kikuyu</td>
</tr>
</tbody>
</table>

(Source: Kenya Dairy Board, 2005)