

**INFLUENCE OF GENDER ACCESS TO AND CONTROL OVER RESOURCES ON
MILK PRODUCTION AMONG SMALLHOLDER DAIRY FARMERS IN
KABARNET DIVISION, BARINGO DISTRICT**

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Requirements of the Award of a Master of Science Degree in Agricultural Extension of
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EGERTON UNIVERSITY

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DECLARATION AND RECOMMENDATION

DECLARATION

I hereby declare that this is my original work and has not been presented for an award of a degree or diploma in this or any other University.

Signature..... Date.....

Tallam, E.J.

RECOMMENDATION

This Research Project has been submitted with my approval as a University supervisor.

Signature..... Date.....

Dr. J.K. Kibett

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DEDICATION

This work is dedicated to my beloved children- Francisca Jepkurui, Wycliffe Kiprotich, Ibrahim Kipsongol and Conso Jerono for their great love, support, encouragement and patience. Their prayers during the entire period were a source of inspiration to me.

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ABSTRACT

Gender is a critical variable in the development process. However, many studies done on gender have indicated that there is lack of gender disaggregated data, especially on women's contribution to smallholder dairy farming. The purpose of the study was to determine, describe and compare the influence of gender in accessing and controlling resources on milk production among smallholder dairy farmers in Kabarnet Division of Baringo District. A survey research using ex-post-facto research design was used for the study. The target population comprised of 106 households with dairy animals under stall-feeding system. A sample of 53 households was chosen for the study using systematic random sampling. Data was collected using a validated structured interview schedule administered to the respondents at their homes. Data was coded and analyzed using Statistical Package for Social Sciences (SPSS). Means, percentages and standard deviations were used to achieve the stated objectives and t-test was used to test the stated hypotheses at 0.05 alpha levels. The study was expected to provide information on gender based differences with regard to access to and control over resources on milk production. The differences would make it possible to determine men's and women's constraints and opportunities within the farming system. Findings from the study indicated that characteristics of the dairy farmers in the study were quite similar irrespective of gender because the unit of sampling was the household, composed of husband and wife. The results also indicated that men had more access to and control over breeding, inputs, credit and extension resources as compared to women. On the level of access and control over milk production resources, the results revealed that men had higher level of access and control. On gender roles, the findings indicated that women were more involved in reproductive and productive work whereas the men were more involved in community and constituency activities. The results also indicated that there was a significant gender difference on the level of access to and control over resources for milk production and that gender access and control on milk production resources did not have significant influence on the levels of milk production. Resulting from the findings of the study, it was recommended that gender mainstreaming be integrated in all development programmes so as to articulate and understand better issues pertaining to gender equity which will in turn increase production and improve livelihoods of men and women in the society.

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ACRONYMS AND ABBREVIATIONS

CIDA	-	Canadian International Development Agency.
CWSGA	-	Centre for Women Studies and Gender Analysis
CTA	-	Technical Cooperation Agency
DAO	-	District Agricultural Officer
DLPO	-	District Livestock Production Officer
FAO	-	Food and Agriculture Organization
IIRR	-	International Institute of Regional Reconstruction.
IFAD	-	International Fund for Agricultural Development
ILCA	-	International Livestock Centre for Africa
GA	-	Gender Analysis
GID	-	Gender in Development
GDP	-	Gross Domestic Product
K.C.C	-	Kenya Cooperative Creameries
MOA	-	Ministry of Agriculture
MOARD	-	Ministry of Agriculture and Rural Development
MOLFD	-	Ministry of Livestock and Fisheries Development
NDDP	-	National Dairy Development Programme
WID	-	Women in Development
ND	-	No Date
NEP	-	National Extension Project
LDP	-	Livestock Development Programme

CHAPTER ONE

INTRODUCTION

1.1 Background Information

Constraints to agricultural productivity are often gender-based, and women face more barriers than men in accessing and controlling over productive resources, which lower their productivity (Ministry of Agriculture, 1999; Ochola, 2002; Oxfam, 1994). According to MOA (1999), program outcomes may not be achieved if planners are not aware of gender-based differences. It is indicated that gender can have a significant contribution towards sustainable development if there is equitable investment by both men and women through increased access to and control over productive resources (Oxfam, 1994).

Women and men are recognized as equally important producers and processors in ensuring food security at the household level; hence there is need for equal opportunities and benefits from such developments (Food and Agriculture Organization, 2002; Ochola, 2002). They also play an increasingly important role in dairy production in other parts of the world (Arnon, 1989; Bagchee, 1994; FAO, 1984; FAO, 1997; IIRR, 1998; World Bank, 2004).

Interventions such as the introduction of zero-grazing units to boost milk production and therefore farmer income have tended to increase labour demands upon the women without necessarily improving their income (International Fund for Agricultural Development, 1994; Ochola, 2002; Oxfam, 1994). National Dairy Development Programme (NDDP) studies done in 1995 showed that women market milk but they are handicapped by the fact that they can control the income only when they sell milk locally in small quantities. When milk production is larger, the milk is sold to Kenya Cooperative Creameries (K.C.C) and the husbands receive and control the income, hence a negative incentive for women to increase milk production (MOA, 1999). The focus on gender is to increase productivity and food security of small farm women and men in a sustainable and equitable manner, based on processes of extension and empowerment that leads to greater self-reliance of both men and women (Ochola, 2002).

Over the years, ideological developments have been reflected in the approach to gender analysis (GA), which evolved from women in development (WID) to gender in development (GID). Women in development approach focused on awareness creation about the distinct priorities, situations and concerns of women to promote efficiency in development and encourage integration of women in the existing development process in the late 1970s

(CWSGA, ND; Ochola, 2002). On the other hand, gender in development attempted to divert focus only on women as the special beneficiaries of development efforts to an equitable distribution of the benefits. It places emphasis on the roles, constraints and incentives under which men and women work in enhancing development, hence, an integrated approach (IFAD, 1994; Niamir-Fuller, 1994; Oxfam, 1994).

During the period of 1900 onwards, gender issues have attracted the attention of many researchers, as well as that of government agencies and there is a sudden emphasis on the need to study the role of men and women in dairy production (FAO, 1984; Kulandaiswamy, 1986; Rangnekar Vasiani & Rangnekar, 1991). It is a common observation that after almost twenty years of calling for the involvement of women in development, they continue to be ignored in livestock projects. Lack of available gender disaggregated data means that women's contribution to agriculture in particular is poorly understood and that their specific needs are too often ignored in development planning. With the recent trend aimed at increasing people's participation in development planning and implementation, gender concerns are becoming more prominent (Safilios- Rothschild, 1983). Projects in general appear to be more oriented towards demonstrating new husbandry techniques to interested individuals who are usually men, than in improving and adapting the techniques to the division of labour that already exists in the community. As a result, women are usually forgotten in these projects (Madeley, 2002; Oxby, 1983).

Currently, gender aspects are an overwhelming concern in all countries and in all fields of social and economic life, however, gender is misunderstood as being the promotion of women only, but gender issues focus not only on women, but on the relationship between men and women, their roles, access to and control over resources, division of labour and needs. Gender relations determine household food security, well-being of the family, planning and production (IFAD, 1994; Oxfam, 1994). It is on that basis that the study focused on the influence of gender access to and control over resources (labour, breeding, inputs, credit, extension, marketing and benefits) on milk production among smallholder dairy farmers in Kabarnet Division of Baringo District.

Baringo District has fourteen (14) Divisions and ten (10) of them have potentiality for dairy farming in the given order: Kabartonjo, Kabarnet, Sacho, Tenges, Kipsaraman, Mochongoi, Salawa, Marigat, Baratabwa and Barwesa Divisions. Dairy cattle population is estimated at 6943 grade animals and 35,202 crosses, giving a total estimate of 42,144 (MOLFD, 2003). The

dairy breeds are predominantly Aryshires, Friesians and a few Guernseys and Jerseys and their crosses in that order. However, the milk produced in the district is not sufficient to meet the local demand, hence the importation of large volumes of fresh milk and milk products from outside districts such as Koibatek, Keiyo, Marakwet, Uasin Gishu, Laikipia and Nandi. In the year 2003, the district produced a total of 518,190 litres of milk whereas a total of 749,560 litres came from outside the District. Brookside and New KCC Ltd dominated the market with Ultra treated fresh milk and milk products, sold in supermarkets and shops to meet the customers' demands, although the prices were high (MOLFD, 2003).

Some of the constraints limiting milk production as indicated in the report include inadequate credit facilities, poor milk marketing channels, and non-availability of desired dairy breeds for the district locally and from outside and where available, prices and transport costs are high. Others include high cost of inputs, poor climate conditions and inadequate extension services. As indicated also in the District Development Plan (1997-2001), the demand for milk in the district is high. The district has a total of 347 smallholder dairy farmers with a total of 1014 animals under stall-feeding (zero-grazing) system. The distribution is shown on Table 1.

Table 1:
Number of Farmers and Number of Animals under Stall-feeding (Zero-grazing) System per Division

Division	No. of Units	No. of animals
Kabartonjo	57	175
Kabarnet	106	318
Sacho	109	310
Tenges	30	61
Kipsaraman	18	94
Salawa	5	10
Mochongoi	17	33
Bartabwa	2	5
Marigat	2	6
Barwesa	1	2
Total	347	1014

Source: MOLFD, (2003).

1.2 Statement of the Problem

Despite the fact that gender is a critical variable in development process, many studies previously done on gender have indicated that there is lack of gender disaggregated data, especially on women's contribution to smallholder dairy farming. Gender biases persist, as farmers are still generally perceived as 'men' by policy makers, development planners and agricultural service providers. For this reason, gender-based differences in gaining access to and control over resources such as credit, inputs, extension and marketing exist, thus lowering the outcome of agricultural development interventions and sustainability. Lack of available gender disaggregated data means that women's contribution to dairy production in particular is poorly understood and that their specific needs are too often ignored in development planning. It is not understood how gender access to and control over resources influence milk production in Kabarnet Division of Baringo District, hence the study was meant to generate empirical information which might assist policy makers in planning gender sensitive and gender responsive dairy projects and the information might also assist in coming up with strategies and interventions aimed at accelerating growth, poverty alleviation and attainment of food security at the household level through mainstreaming gender issues for agricultural/livestock development.

1.3 Purpose of the Study

The purpose of the study was to determine, describe and compare the influence of gender in accessing and controlling milk production resources (labour, breeding, inputs, credit, extension, marketing and benefits) on milk production among smallholder dairy farmers in Kabarnet Division of Baringo District.

1.4 Objectives of the Study

The specific objectives of the study were: -

- (i) To determine and describe gender difference in the levels of access to milk production resources of smallholder dairy farmers in Kabarnet Division.
- (ii) To determine and describe gender difference in the levels of control over milk production resources of smallholder dairy farmers in Kabarnet Division.
- (iii) To determine the influence of gender access to milk production resources on milk production levels among smallholder dairy farmers in Kabarnet Division.

- (iv) To determine the influence of gender control over milk production resources on milk production levels among smallholder dairy farmers in Kabarnet Division.
- (v) To determine the influence of gender roles on access and control over milk production resources of smallholder dairy farmers in Kabarnet Division.

1.5 Hypotheses of the Study

The following hypotheses were tested at 0.05 level of significance: -

Ho₁ There is no statistically significant gender difference in the levels of access to milk production resources among smallholder dairy farmers in Kabarnet Division.

Ho₂ There is no statistically significant gender difference in the levels of control over milk production resources among smallholder dairy farmers in Kabarnet Division.

Ho₃ There is no statistically significant influence in gender access to milk production resources on milk production levels among smallholder dairy farmers in Kabarnet Division.

Ho₄. There is no statistically significant influence in gender control to milk production resources on milk production levels among smallholder dairy farmers in Kabarnet Division.

Ho₅ Gender roles have no significant influence on access and control over milk production resources among smallholder dairy farmers in Kabarnet Division.

1.6 Significance of the Study

Information from this study may be of benefit to farmers, extension personnel, policy makers and researchers. It may lead to the formulation of policies and decisions on gender equity for increased food production and food security among households. The study systematically investigated and documented the influence of gender access and control over resources (labour, breeding, inputs, credit, extension, marketing and benefits) on milk production among smallholder dairy farmers in Kabarnet Division of Baringo District. Gender disparities as far as milk production is concerned were documented and information may assist in coming up with strategies and interventions aimed at accelerating growth, poverty alleviation and attainment of food security at the household level through mainstreaming gender issues for agricultural/livestock development. It may enable men and women to improve their standard of living through equity of access to and control over resources on milk production, which may lead to increased programme efficiency, effectiveness and sustainability, hence holistic development. The outcome of the study may also be used to support similar studies previously

done on gender in other districts in Kenya for generalization to smallholder dairy farmers in the country.

1.7 Scope of the Study

The study covered smallholder dairy farmers with average farm size of 2 to 6 acres and keeping 2 to 4 animals under stall-feeding system in Kabarnet Division of Baringo District. The study looked into the levels of gender access to and control over milk production resources among smallholder dairy farmers and also the influence of gender access to and control over milk production resources on milk production levels among smallholder dairy farmers in Kabarnet Division. Gender roles were also incorporated into the study as moderator variables to reduce variation of the independent variables on the dependent variable.

1.8 Limitations of the Study

One limitation was on the use of the instrument for data collection, that was, the structured interview schedule. Misinterpretation of questions by the respondents may have resulted in loss of valuable data. Structured interview schedule has rigidity because of already pre-test questions for the respondent. In an ex-post- facto design, the researcher cannot control or manipulate the independent variables and the results may not have reflected a true relationship between the variables but that was controlled by incorporating moderator variables, that was gender roles as part of the study to reduce variation of the independent variables, that was access to and control over milk production and on the dependent variable (level of milk production). The challenges the researcher faced from interviewees included not able to meet the two household respondents at the same time, thus caused postponements and some of the women respondents were not free enough to give vital information as they indicated that they were not the heads of the households.

1.9 Assumptions of the Study

The study assumed that the design chosen, ex-post-facto, was workable and provided the required information and that the factors that were being studied had no influence on one another. Also the dairy farmers fell in the same agro-ecological zone with similar conditions. Milk yields of the dairy animals were controlled by comparing all the animals at mid-lactation of 1st calving to avoid extraneous variations. Other extraneous variables such as farmer's personal characteristics (age, level of education) and income were assumed in the study.

1.10 Definition of Terms

For the purposes of the study, the following operational terms applied;

Access to Resources

Access to means the ability of an individual to get to and use a particular resource. In the study it meant men and women's access to milk production resources (labour, breeding, inputs, credit, extension, marketing and benefits) in Kabarnet Division, Baringo District.

Control over Resources

Control over a resource means a person is in a position to take management decisions concerning the allocation of the resource and the production process itself. In the study, it meant men and women's control over resources on milk production such as labour, inputs and credit in Kabarnet Division, Baringo District.

Gender

Gender is a socio-cultural construction that refers to roles, responsibilities, characterized attitude and belief about or towards men and women, boys and girls in a given society. In the study it meant, men and women in Kabarnet Division, Baringo District play different roles, have different needs, and face different constraints.

Gender in Development (GID)

This is an approach that focuses on the social, economic and benefit from utilization of scarce resource by both men and women. In the study, it meant how men and women benefited on milk production based on the utilization of milk production resources in Kabarnet Division, Baringo District.

Gender Analysis (GA)

Refers to the in-depth study of the different roles of men and women to understand what they do, what resources they have and what their needs and priorities are. In the study, it meant how men and women in the study area performed various roles that pertained to milk production.

Gender Awareness

It is the realization that there is a problem concerning gender. In this study, it referred to problems between men and women in accessing and controlling over milk production resources.

Gender Disaggregated Data

It refers to collection of data along gender lines. In this study, it meant collecting data on influence of gender access and control over resources on milk production.

Gender Disparities

This refers to inequalities whereby one sex is disadvantaged whereas the other is favoured. In the study, it meant finding out gender inequalities in the study area between men and women in access to and control over resources in relation to milk production.

Gender Equity

Refers to a condition in which men and women participate as equals, have equal access to resources and opportunities to exercise control. In this study, it meant finding out men's and women's participation in accessing, controlling and benefiting from milk production enterprise in the study area.

Gender Responsive

Refers to interventions intended to transform existing distributions to create a more balanced relationship between men and women. In the study, it meant focusing how access to and control over productive resources affected men and women on milk production.

Gender Roles

Gender roles are roles classified by sex and are socially constructed and differ according to society, social class and culture. In the study, gender roles meant reproductive, productive, community and constituency-based roles performed by men and women in the study area.

Smallholder Dairy Farmer

In the study, it referred to a farmer with average farm size of 2 to 6 acres and keeping 2 to 4 animals under stall-feeding system in Kabarnet Division.

Women in Development (WID)

Is a development approach that focuses on the specific needs of women. In the study, the focus was not on women, but on both men and women for increased production in Kabarnet Division.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter contains literature that supported the study and includes gender roles, nature of gender work, smallholder dairy development worldwide, smallholder dairy farming in Kenya, gender concept and food production, gender and smallholder dairy production, gender analysis and access to and control over resources (labour, breeding, inputs, credit, extension, marketing and benefits in relation to milk production. It also contains the conceptual framework that showed the relationship of the variables that were studied.

2.2 Gender Roles

These are fundamental issues in gender analysis, which examines the access and control that men and women have over resources such as labour and inputs. These are important in enabling their incorporation in development programmes for gender equity (CIDA, 2004; FAO, 2002). According to FAO (2004a), socio-economic and institutional frameworks play an important role in determining who does what and who gets what, but social and cultural norms dictate the division of labour and control over assets. Value, norms and moral codes embedded in culture and tradition have very strong influence on gender issues as they determine attitudes and the organizational set-up of the community system. Like culture and traditions, political, institutional and legal structures also change slowly. Hence, these latter factors often impede the implementation of gender-balanced programmes, but special attention has to be however given to the social and cultural reality in a specific society.

2.2.1 Reproductive Work

Reproductive activities are related to domestic or household tasks associated with creating and sustaining children and family and include bearing and caring for children, preparing food, collecting water and fuel wood, shopping, housekeeping and family healthcare done by women and are required to guarantee the maintenance and reproduction of the labour force. It includes not only biological reproduction but also the care and maintenance of the workforce (men partner and working children) and the future workforce (infants and school-going children) (CIDA, 2004; Hill, 2002; Oxfam, 1994; Oniang'o, 1999; Rangnekar, *et al*, 1991). Although reproductive work is crucial to human survival, it is seldom considered real work and has no

monetary value. In poor communities in most parts of Sub-Saharan Africa, reproductive work is usually labour intensive and time consuming and is almost always the responsibility of women and girls (IIRR, 1998; Madeley, 2002; Ochola, 2002; Oxfam, 1994; Oniang'o, 1999; Rangnekar *et al.*, 1991).

2.2.2 Productive Work

Productive work includes activities related to production of goods for consumption or income through work in or outside the home and includes farming and business. Both men and women can be involved in productive activities but, for the most part, their functions and responsibilities will differ according to gender divisions of labour. Women's productive work is often less visible and less valued than men's (FAO, 1990; Oxfam, 1994; Oniang'o, 1999). According to Ochola (2002), women perform substantial productive work but have little control over resources. It is also indicated that women carry out a multitude of activities that are mostly classified as non-economic (Kpohazoude, 1995; MOA, 1999).

2.2.3 Community Work

Community work includes tasks and responsibilities carried out for the benefit of the community to ensure the provision and maintenance of scarce resources of collective consumption and may include building a school, clinic, repairing access roads and attending meetings. More often than not, women's roles are less visible than men's (CIDA, 2004; Oniang'o, 1999).

2.2.4 Constituency-Based Roles

These are managerial and leadership roles, which often favour men than women and these are activities primarily undertaken by men at the constituency level, organizing at the formal political, often within the framework of national politics. This is usually paid work, either directly or indirectly, through status or power (CIDA, 2004).

2.3 Nature of Gender Work

According to FAO (2004b), the major constraint to the effective recognition of gender roles and responsibilities in agriculture/livestock is the scarcity of gender-disaggregated data available to technicians, planners and policy makers. In Sub-Saharan Africa for example, micro level studies have shown that women play a crucial role in many aspects of food production, whereas men play minimal roles (Rangnekar *et al.*, 1991). According to IIRR (1998), women in

Sub-Saharan Africa work almost twice as many hours as men and in Kenya, they form the core of the smallholder farm labour force. It is necessary that gender surveys and research on the roles of rural men and women in agriculture/livestock be carried out in order to determine and mainstream gender based differences and incorporated into general agriculture development (FAO, 1997). Although women are essential to improving nutrition, increasing the production and distribution of food and enhancing the living conditions of people in the rural areas agriculture must be seen in terms of a whole farming system, that is, the contribution of men, women and children (Bagchee, 1994; Olubandwa, 1998).

2.4 Smallholder Dairy Development

This section covers Smallholder Dairy Development worldwide and Smallholder Dairy Farming in Kenya.

2.4.1 Smallholder Dairy Development Worldwide

Smallholder dairy production is common in many parts of the developing world, providing an important source of nutrition and income to millions of households. Income from such production often accrues to women who use this to provide better nutrition and education for their children. Projections for future growth in demand for livestock products shown good growth prospects for the dairy industry. Globally, there are about 300 million rural and peri-urban poor whose livelihoods depend on the daily income and nutrition they receive from milk production. In India, about 40 million landless poor families get a major part of their income from milk. Markets in developing countries are secure as demand for milk and milk products is expected to increase by more than 3% annually over the next 10 to 20 years (Muinga, Thornton & Nicholson, 2002).

In many parts of sub-Saharan Africa, smallholder farmers are being compelled by policy and markets to diversify from traditional export crops, whose outlook for growth remains uncertain to alternative production activities which offer higher returns to land and labour, offer the expectation of future growth and are suitable for adoption by the resource- poor smallholder dairy farmers who continue to dominate African production (Staal, Chege, Kinyanjui, Kimani, Lukuyu, Njubi, Owango, Thorpe & Wambugu, 1997).

The involvement of women in smallholder dairy and livestock production in general is a long-standing tradition all over the world and are mostly involved in milk production, although not all women control the marketing of milk and its products (Niamir-Fuller, 1994). Women play an important role in activities dealing with livestock such as care, management and marketing of products such as milk and therefore livestock sub-sector is a privileged entry point to promote gender balanced development in rural areas of developing countries. It is an aid to better understand what can be done and what should be kept in mind for implementing gender approach in livestock projects (Baumann, 2000).

Only about one-third of the world's milk production takes place in developing countries that nevertheless, account for over 70% of the world's population. A significant number of these countries have large food deficits, particularly with regard to milk and milk products and over 70% of these have to be imported. Worse still, the annual per capita consumption of milk in developing countries amounts to less than 20% of that is in developed world (FAO, 1995).

2.4.2 Smallholder Dairy Farming in Kenya

Before Kenya gained its independence in 1963, commercial dairy production was the sole preserve of white farmers and smallholder farmers were not allowed to own dairy cattle (Reynolds, Metz & Kiptarus, 2004). After independence in 1963, improved dairy cattle increasingly came into the hands of small African farmers as settlers sold theirs (Omore, Muriuki, Kinyanjui, Owango & Staal, 1999). There are slightly over three million dairy cattle in Kenya, mainly black and white Friesians, Aryshires, Channel Island Breeds and various Crosses, concentrated in the high potential areas (Schreiber, 2002). A variety of production systems are employed by smallholder dairy farmers, ranging from stall-feed cut-and-carry systems (zero-grazing) to free-grazing or semi zero-grazing systems (Reynolds *et al*; 2004).

According to Muma and Omiti (2000), the dairy sector accounts for 25-35% of the agricultural Gross Domestic product (GDP) through an annual milk production of an estimated 2500 million litres. Smallholder dairy farms average 2 hectares and contribute to about 80% of marketed milk. Milk production is based on grade cattle namely Aryshires, Friesians, Guernseys and their Cross- breeds which number about 3.2 million in 1998/99 and the dairy herd is concentrated mainly in the high potential areas of Central, Rift valley and Eastern provinces (Muma, *et al*, 2000).

Small-scale dairy processing and marketing in Kenya received a further boost following policy changes that liberalized dairy marketing in 1992 and improved the prices. Since the policy shift, the dairy industry has seen major changes ranging from the near collapse of the KCC to the emergence of many small and large-scale milk traders who participate in both formal and informal milk markets. The dominant raw milk markets currently employ thousands of people who are estimated to handle about one-third of the total marketed milk produced by some 600,000 smallholder dairy farmers who sell 55% of all milk to neighbouring consumers and institutions, 8% sold directly to processors with small traders and co-operatives handling the rest (Omore *et al*, 1999). The small milk traders include mobile milk traders, milk bars and shops/kiosks and small processors.

2.5 Gender Concept and Food Production

According to FAO (1994) and Madeley, (2002), women are the mainstay of small-scale agriculture, labour force and day-to-day family subsistence and have more difficulties than men in gaining access to resources such as land and credit and productivity enhancing inputs and services. Women's limited access to resources and their insufficient purchasing power are products of interrelated social, economic and cultural factors that force them into a subordinate role, to the detriment of their own development and that of society as a whole (FAO, 1997; IIRR, 1998). It is also indicated that the importance of women farmers is increasing as fewer and fewer men are farmers as agricultural policies in developing countries have generally been framed for men, not women farmers and can create additional burdens for women (Oniang'o, 1999). According to FAO (2002), reducing gender inequality and empowering women would yield significant reductions in hunger and poverty.

2.5.1 Gender and Smallholder Dairy Production

Results from survey carried out in Kiambu district on labour contribution of women to dairy operations indicated that 70.4% of dairy operators are women and 29.6% are men, underlining the traditionally important role of women in milk production in Kenya (Tangka, Ouma & Staal, 2004). An IFAD (1994) study of women livestock managers, notes that the gender division of labour can vary greatly from society to society and can change over time. Nonetheless, in most societies, women are responsible for milking animals and for processing and marketing milk.

Impact-oriented studies in Kenya have examined changes in women's roles in livestock production and marketing and how more intensive dairying affects the nutritional status of households (FAO, 1990, 2002; 2004c; Huss-Ashmore, 1992; Muinga, *et al*; 2002). Many of these studies were motivated at least in part by the efforts of the National Dairy Development Project (NDDP), which actively promoted dairy cows and related techniques in 24 districts in Kenya from the early 1980's to 1995 with the aim of increasing milk production to meet market demand. A study from Bangladesh reported by Banu (1987) indicated that most indoor jobs of dairy management were done by women and in the absence of capital, the women kept dairy animals through a share system. Livestock were an important source of income for poor rural women and food of high nutritional value. In agro pastoral societies in Sub-Saharan Africa women look after milk animals whereas men and boys care for men and non-lactating animals though in some other areas including south east Asia, men do the actual milking, which shows how difficult it is at times to generalize (IFAD, 1994).

Despite of women's considerable involvement and contribution, their role in dairy production is widely ignored due to biases both from men and women, who are often conditioned by their culture and society to undervalue their own worth (Dieckmann, 1994; Niamir-Fuller, 1994). In addition, information on the role of women in dairy production often obscures the actual contribution of women, because of the biases of the respondents, the biases of surveyors and biases inherent in the definitions of employment (Tangka *et al*, 2004). For example in Bolivia, women are responsible for dairy management and men for crops but the latter is not differentiated from work in surveys and censuses, and women's work is rarely considered economically important for the nation (de Schulze & Sostres, 1991). In Orissa region in India, it is reported that women perform all the day-to-day activities related to caring, feeding, cleaning and milking of dairy animals (FAO, 1998). This is also found in Latin American and Caribbean societies where women's productive labour is not differentiated from their reproductive work and their contribution is undervalued, thus losing the value of work and becoming merely an activity (IFAD, 1994). It is instructive to note that women in the developing world work longer hours and for more years than men. For example the participation of Iparakuyu women in the labour force lasts until age fails them while Iparakuyu men enter elderhood at the age of about 60 (Ndagala, 1991).

2.5.2 Gender Analysis

Gender analysis systematically analyses both quantitative and qualitative information on men's and women's activities, access to and control over productive resources and benefits and their implications on development interventions (CWSGA, (ND); CBNP, 2002). According to Oxfam (1994), gender analysis can significantly increase efficiency, sustainability and equity in interventions for rural and agricultural development, as it reveals gender-based differences which provide a fuller perspective from which to determine priorities and strategies required to address them.

Gender analysis tools include activity profile, which is used to study and analyze the different gender roles and responsibilities, which is important in identifying target groups for project interventions and foresee the consequences in terms of labour division and total workload (CBNP, 2002; CWSGA, (ND); MOA, 1999; Ochola, 2002; Oxfam, 1994). Access and control profile on the other hand, identifies resources that men and women require for their work and the benefits they obtain. It is useful in developing solutions to address constraints related to access and control over resources and benefits (MOA, 2000).

2.6 Gender Access to and Control over Milk Production Resources

Access to and control over resources is one of the most pressing issues in many families and communities (CWSGA, (ND); Oxfam, 1994). Access and control profile of gender analysis documents the gender groups that use the resources and benefits from projects as well as those who culturally make the final decision on when, how and who to use the resource and benefit. It is used to identify and specify access to and control over resources and the benefits by men and women.

The main objective of doing an access and control profile is to identify resources men and women require for their work, know who has access to and control over and to understand the implications. The tool explains why projects that fail to address the gender access and control issues experience persistent gender withdrawal or total collapse (CWSGA, (ND)) and therefore, there is need to develop solutions to address constraints related to access to and control over resources. Gender can have a significant contribution towards sustainable development if there is equitable investment by both men and women through increased access to and control over productive resources such as in Dairy Development (Oxfam, 1994).

2.6.1 Gender Access and Control over Labour in Dairy Production

Milk production consists of basic and compulsory daily routine of feeding, milking, watering and taking care of animals together with other major activities related to milk production that includes production, harvesting and cutting of fodder crops (Niamir-Fuller, 1994). In Africa, it is common to find the women are responsible for grazing, watering and feeding animals, thereby increasing their workloads (IFAD, 1994; Madeley, 2002). In some communities, men also feed and water animals. With few exceptions, women usually provide labour and have the right to use animals but do not own animals or make decisions regarding them or their disposal. Even when they are owners, they often do not have absolute control over the animals' management and disposal (IFAD, 1994). Studies done in Tanzania indicated that women could only control those cows allocated to them by their husbands as well as decide upon different milk usage though women and children may also own some animals through inheritance or gift (Hill, 2002). Women are the dominant smallholder dairy operators in the intensive, mostly stall-feeding system of Kenya and their labour contribution to dairy was only 5.5% compared to 5% in those with indigenous cattle (Tangka *et al*, 2004). Mullins (1996) also reported that although women's overall workload increased, they consistently stated that they were nevertheless better off due to income increases and stability. Holeta survey results done by (Tangka *et al*, 2004) in Ethiopia (1996/97) indicated that intensified dairying apparently does not significantly increase women's dairy-related labour.

2.6.2 Gender Access to and Control over Breeding of Dairy Animals

Intensification of smallholder dairy production involves the adoption of a combination of cattle breeds with increased genetic potential for milk production (Muinga *et al* 2002). More often than not, it is difficult for women and poor farmers to have access to breeding services such as artificial insemination for their dairy animals because the services are not easily available and the prices are normally high (Dieckmann, 1994; Schreiber, 2002). It is usually the men who make decisions on breeding and other related decisions (Dieckmann, 1994, IIRR, 1998).

2.6.3 Gender Access to and Control over Inputs

Women dairy operators' access to productive inputs has not been well established. Intensive dairying means greater reliance on cut and carry of fodder to stall-feed animals that require a greater input per milk unit produced. However, according to IIRR (1998), women generally lack necessary inputs to increase milk production due to poverty and lack of control over benefits from the farm. This is because men take most of the investment decisions yet for increased milk production, supplementation through the use of concentrate feeds is ideal.

2.6.4 Gender Access to and Control over Credit

In many households, particularly in areas where there is a situation of men out-migration to urban centers in search of jobs, the women become the de-facto heads of their families, but are not psychologically prepared to take important decisions regarding improvement in smallholder dairy production systems such as taking advantage of loan schemes (CIDA, 2004; Dieckmann, 1994). Furthermore, women have limited access to credit facilities due to lack of collateral, cultural, traditional, institutional and sociological factors. In most cases, the lands are registered under the men (Arnon, 1989; CIDA, 2004; Dieckmann, 1994; FAO, 1997, 2002; Madeley, 2002; Ochola, 2002). According to the FAO (1984), women's workloads further increase with the intensification of agriculture, if the tasks are manual while men's roles increase if the tasks are mechanized. Provisions of credit are almost exclusively made to men as they have title deeds and are members of cooperative societies. Lack of credit prevents women from investing more on smallholder dairy improvement for improved productivity and provision of additional source of income with which to improve the welfare of the family (Arnon, 1989). Women will benefit more if they get more access to credit to purchase needed veterinary services and supplements.

2.6.5 Gender Access to and Control over Extension

Despite rapid advances in agricultural technology and heavy expenditure by the government and donors on agricultural extension, as much as one-fifth of mankind mostly in developing countries still go hungry (FAO, 2002). Extension programmes should have resulted to increased agricultural productivity and rural incomes by bridging the gap between new technical knowledge and farmers' practices but the achievement have been below the expectation. The households have been assumed to be homogenous unit with common goals, productive resources at the disposal of all family members joint, decision-making and share accruing benefits equally. In practice however, this has been found to be different (MOA 1999). The need to correct the previous planning and implementation errors in development has resulted to introduction of gender issues (Ochola, 2002). Gender is increasingly being recognized as a socio-economic variable with major implications for agricultural productivity (MOA, 1999). However, major attention has to be focused on the fact that gender changes are very slow and therefore programme goals should not be too ambitious in gender issues (IFAD, 1994).

An important factor that enhances women's dairy productivity is the extent to which they have access to education and training (Muinga *et al*, 2002). Gender bias is perhaps most evident in field operations where extension agents are usually men and will not communicate effectively with women. Where there are women extension agents in livestock production, experience has shown that men and women in rural communities accept them equally. Extension agents, both men and women should be trained in gender analysis in order to mainstream gender issues in milk production (IFAD, 1994). According to Saito (1995), women utilize extension services more efficiently than men farmers. Often, men extension workers have maintained a structured bias against women and tended to benefit men regarding advice on the use of agricultural principles (Chambers, 1983; Saito & Weidemann, 1990).

Reports by CIDA (2004), CTA (1995), FAO (1997), Kampen and Schwarts (1992) and Oniang'o (1999) indicated that women have limited access to extension services mainly due to men's strong position as heads of households and greater off-farm mobility. They further argued that training and extension should be directed towards those people who do the actual work and in the case of smallholder dairy production, women do the bulk of the work yet extension is directed to men and is expected that the information will trickle down to the women. This process is very inefficient and results in a considerable loss of information. The nature and quality of women's work does not allow them the same mobility and time availability as men, have lower formal education and hamper them from taking part in extension activities requiring formal reading and arithmetic skills (CIDA, 2004). Although in most societies, all household members are involved in some way or another in dairy production, men determine the decision-making processes within the family on various activities.

2.6.6 Gender Access to and Control over Marketing

In many societies, women have access to milk and milk marketing when the quantities are small, but when larger, the men take control of marketing and decisions on how to utilize the income thus depriving the women (Dieckmann, 1994; Hill, 2002; Maarse, 1995; MOA 1999). Men often control milk collection centers and livestock cooperatives, once they are established because of women's illiteracy and the fact that when income from an activity is small, it is women's domain, but when income becomes significant, men take over its management and decide on its disposal (Niamir- Fuller, 1994).

2.6.7 Benefits from Milk Production

Dairy products are a source of high-quality animal protein and therefore increasing milk production increases the availability of protein-rich food for the rural population and income generation for farmers as well as the availability of dairy products for urban consumers (Dieckmann, 1994). Milk is treated as a source of cash resulting to greater market orientation of smallholder farm households (Shapiro, Gebre-world & Zebini, 1996). Intensification of dairy production has been shown to potentially raise milk production and income, especially where demand and infrastructure are favourable (Staal *et al.*, 1997; Tangka *et al.*, 2004). Because milk can be marketed daily throughout the year, more regular daily cash incomes enhance dairy households' ability to purchase needed food items during food shortage periods and hence smooth consumption throughout the year. In general, women tend to spend the money they earn from milk and other sales on the welfare of their families compared to men and favour the provision of basic goods and services required to meet the needs of the family (IFAD, 1999; Madeley, 2002 Oniang'o, 1999). In traditional dairy production practices in Ethiopia, women via the processing and marketing of butter and cheese earn 69% of the dairy income and they maintain control of this money and spend it to purchase household items (Whalen, 1983). Men and women use the incomes they control to meet different objectives such as women spending more money on food purchases by virtue of them being responsible for food preparation than men (Tangka *et al* 2004). In many societies, the little income derived from daily milk marketing is sometimes used by men for alcohol and thus continues to be an intractable issue in many societies (IFAD, 1994). Smallholder dairying can have other positive impacts on soil fertility in mixed cropping systems as manure can be used to improve household food production like vegetable and other food crop production (FAO, 2002).

2.7 Summary of Literature Review

Husbands and wives both usually have a say over the use of resources, although there may be unequal and often conflicting claims on resources for the satisfaction of basic needs (Tangka *et al*, 2004). Men's de jure ownership rights over animals are guaranteed by a near universal set of inheritance rules that are gender biased and rooted in religion and patriarchal kinship systems (Dahl, 1987). Women in general have less access to the means of production in comparison with the extent of their labour contribution. There are, however important regional variations. Accurate information about men's and women's relative access to and control over resources is required and to neglect these gender differences or make improper assumptions about the roles or responsibilities of producers will only lead to more unsustainable and

inappropriate development efforts (FAO, 2002). Access to and control over resources is crucial in the development of food security strategies.

2.8 Conceptual Framework

The study was based on Harvard’s Analytical Framework Model of Gender Analysis, which aids in generating gender-disaggregated data {CBNP, 2002; CWSGA, (ND)}. It consists of activity profile, that deal with the concept of gender labour and its implication on development interventions and access and control profile that identifies the resources men and women can command to carry out their activities. It describes access to and control over resources by men and women and the benefits they get.

The main independent variables in the framework are the gender access and control over resources (labour, breeding, inputs, credit, extension, marketing and benefits). The levels of gender access and control over milk production resources were determined as well as their influence on milk production levels. Milk production is the dependent variable. The overall influence of the independent variables on the dependent variable is seen on the men’s and women’s levels of access and control over resources and their influences on milk production resources on milk production levels. The moderator variables selected for the study were gender roles (reproductive, productive, community and constituency-based). They have a direct influence on the independent variables and cannot be controlled, hence were incorporated into the study to reduce influence on dependent variable. The relationship of the independent variables on the dependent variable is depicted in Figure 2.

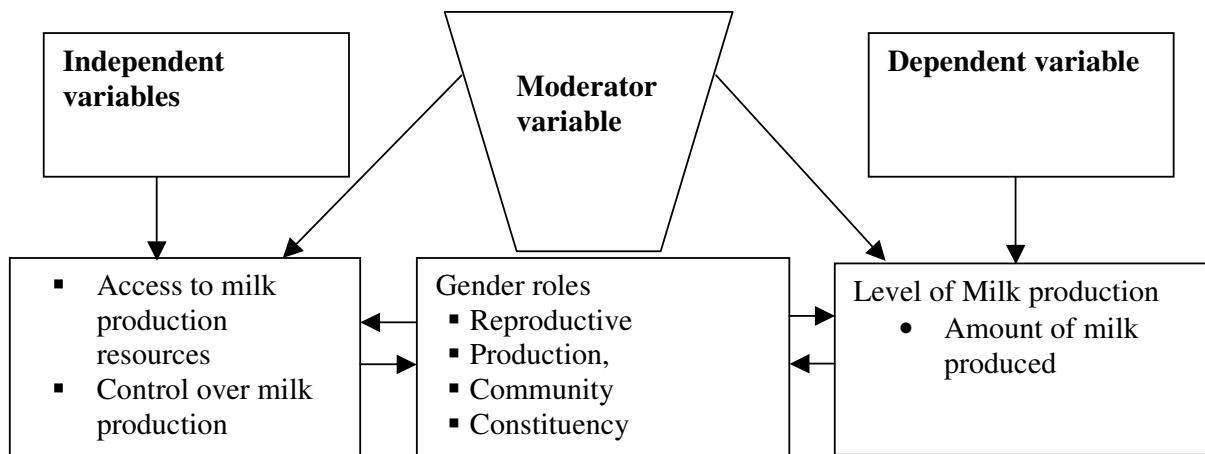


Figure 1: Conceptual Framework on Influence of Access to and Control over Milk Production Resources on Milk Production

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter contains information that guided the research process and include Research Methodology and Design, Location of the study, Population of the study, Sampling procedure and sample size, Instrumentation, Data collection procedures and Data Analyses.

3.2 Research Design

The study was a survey research using ex-post-facto design that gives cause/effect relationship. According to Ary, Jacobs and Razavieh (1979); Borg and Gall (1996) and Fraenkel and Wallen (2000), ex-post- facto is a research conducted after variation in the independent variables have been determined in the natural course of events. The researcher has no control of independent variables because their manifestations have already occurred or because they are inherently not manipulable. This study examined the effect that gender access and control over resources had on milk production in the study area that examined the effect of “a naturalistically occurring treatment after the treatment has occurred”, Kathuri and Pals, (1993).

3.3 Location of the Study

The study was carried out in Kabarnet Division of Baringo District. The Division was chosen because it is one of the high potential Divisions in milk production and this was done through random sampling from Divisions with high potential. The Division has an area of 506 sq km with 9 locations and a population of 42,762 with 5730 households. It has a population density of 60 persons per sq. km (District Statistics Office, Baringo, 2001; District Development Plan, 1997-2001; MOLFD, 2003 b). Part of the division is within Municipal council of Kabarnet. Altitude ranges from 1200-2200 metres above sea level and average mean annual temperatures vary from 16-18⁰C. The soils vary and range from well-drained, shallow reddish- brown, friable, stony and rocky clay loams.

The Division experiences a bimodal rainfall regime. The long rains start from the month of March to June whereas the short rains from September to November. The rainfall reliability is about 70% and varies from 1100 mm in the highlands to 600 mm in the lowlands. The major enterprises are crop and smallholder dairy farming (MOLFD, 2003 a & b). Kabarnet Division has a total of 106 smallholder dairy farmers who keep dairy animals under stall-feeding system and the animals consist of both pure and cross-breeds (Friesians, Aryshires and crosses)

(MOLFD, 2003a). Most of the dairy activities such as feeding, milking and watering are performed by the women farmers.

3.4 Population of the Study

The target population consisted of 106 households with dairy animals under stall-feeding system. They are mixed farmers who keep dairy animals, shoats, local poultry and few with commercial layers and broilers. They also grow food, cash and fodder crops as well as pastures, which include maize, beans, bananas, cassava, vegetables, and coffee. Others are napier grass, fodder trees and grasses. The farmers have been exposed to various extension projects such as National Extension Project (NEP), National Dairy Development Programme (NDDP) and Livestock Development Programme (LDP). The dairy farmers for the study were particularly under LDP, sponsored jointly by the GOK/Finland from 1991 to June, 2003 (MOLFD, 2003 a & b).

Extension packages under LDP included upgrading and management of dairy animals, fodder/pasture production and conservation, Agroforestry establishment and farmer trainings (MOLFD, 2003a). The dairy animals for the study consist of both grade and cross-breeds of Friesians, Aryshires, Guernseys and Jerseys. The farmers either source quality heifers from reputable farms in Nakuru, Uasin Gishu, Keiyo and Koibatek or upgrade their foundation stock through AI services or Bull Scheme/ Natural service. Milk yields range from 5 to 20 litres/animal/day depending on the breed and level of management (MOLFD, 2003b).

3.5 Sampling Procedure and Sample Size

Fifty three households were sampled from the total target population of 106 using systematic sampling procedure. A comprehensive numbered list of 106 households with zero-grazing units was obtained from the Divisional Livestock Extension Officer; Kabarnet Division. The list was compiled randomly. The first household on the list was taken as the random number and every subsequent odd number was included in the sample.

The total numbers of respondents were 106, that is, 53 households with husbands and wives. In a case where there were two or more women in a household, only one was chosen randomly, and for married sons, they were listed as independent households with their own zero-grazing units. Households with widows/widowers were not included in the study because the unit of sampling was a household composed of husband and wife.

Considering the fact that Kathuri and Pals (1993) recommends a minimum sample of 100 in a survey research, then the sample was ideal. It should be noted that the unit of sampling for the study was the household and not the smallholder dairy farmers.

3.6 Instrumentation

This section discusses the tool used for Data Collection (Structured Interview Schedule), Validation of the Instrument as well as its Reliability.

3.6.1. Structured Interview Schedule

A validated structured interview schedule was used to collect data for the study because of its efficiency, economy and practical and allow for the use of a larger sample (Fraenkel & Wallen, 2000). The validated structured interview schedule contained standard instructions which were given to all respondents with questions and alternative answers to them. Interviews were conducted orally and the answers to the questions were recorded by the researcher and could elaborate on questions and explain their meanings in case they were not clear to the respondents.

Administration and scoring of a structured interview schedule is normally straightforward and the results lend themselves readily to analysis (Ary, Jacobs & Razavieh, 1979; Mugenda & Mugenda, 1999). Face-to-face interviewing places less of a burden on the reading and writing skills of the respondents (Fraenkel & Wallen, 2000).

The interview schedule had various sections and items and part of it was adapted and modified from Harvard Analytical Framework Model of Gender Analysis (See Appendix A).

3.6.2. Validation of the Instrument

Validity refers to the extent to which an instrument measures what it is intended to measure (Ary, Jacobs & Razavieh, 1979) and it is also the degree to which results obtained from the analysis of the data actually represent the phenomena under study (Mugenda & Mugenda, 1999). Validation is the process of collecting evidence to support inferences based on data collected. The inferences should be appropriate, meaningful and useful (Fraenkel & Wallen, 2000). The instrument was checked for validity through discussion with the supervisor and two course colleagues'. Useful comments and suggestions were incorporated to improve on the instrument and to ensure that the included items measured what they were intended to measure. Reviewing of the instrument assisted in ensuring all aspects of validity (face, content, criterion, construct) were addressed to avoid biased responses from the respondents.

3.6.3. Reliability of the Instrument

Reliability of a measuring instrument is the degree of consistency with which it measures whatever it is measuring after repeated trials. It also refers to the consistency of the scores obtained from one set of items to another (Ary, Jacobs & Razavieh, 1979; Mugenda & Mugenda, 1999).

The instrument was pre-tested with 30 respondents from 15 households in Tenges Division. According to Mugenda & Mugenda, (1999), a pre-test sample should be between 1% and 10% of the calculated sample, depending on the sample size. The sample size for the study was 53 households with husbands and wives, giving a total number of 106 respondents hence the pre-test sample fell within the acceptable range.

In this study, internal consistency of the instrument was calculated using Cronbach alpha coefficient, which is a general form of the KR20 (Kuder-Richardson approach (Fraenkel & Wallen, 2000)). The results of the pre-test indicated a reliability coefficient of 0.744, which agrees with Fraenkel and Wallen (2000) recommendation that a reliability of 0.7 or higher is ideal for social research. The reliability of the instrument was further improved through the removal of ambiguous questions.

3.6 Data Collection Procedures

The researcher applied and obtained a research approval from the Department of Agricultural Education & Extension, Egerton University, after which she proceeded to the DAO and DLPO's offices, Baringo District to brief the DAO and DLPO on the purpose of the study and sought their permission to carry out the research with assistance of the officers from the selected Division.

Following the approval, the researcher proceeded to Kabarnet Divisional Office for official communication on the study and the area of interest to the officers. She was received well and she proceeded to recruit and trained two research assistants on the use of the instrument for data collection. Thereafter the researcher and her two assistants proceeded to the field to get acquainted to the area with assistance of the extension worker and finally, carried out the research by administering the instrument to the respondents in a face-to-face interview and responses recorded accordingly.

3.7 Data Analysis

The formulated hypotheses for the study were tested by employing quantitative analysis. The null hypotheses were tested at 0.05 level of significance. The collected data was coded and analyzed using the Statistical Package for Social Sciences (SPSS) computer program. For hypotheses 1 to 5, inferential statistics were used to generate required quantitative data. T-test was used to compare the sample means of men and women on the levels of access and control over milk production resources by both men and women as well as determine the influence of moderator variables on the dependent variable. The null hypotheses were rejected or accepted at 0.05 alpha levels. Summary of data analysis is shown in Table 2.

Table 2:
Summary of Data Analysis

HYPOTHESIS	INDEPENDENT VARIABLE	DEPENDENT VARIABLE	METHOD OF ANALYSIS
Ho ₁ There is no statistically significant gender difference in the levels of access to milk production resources among the smallholder dairy farmers.	Levels of gender access to milk production resources: Labour, breeding, inputs, credit, extension, marketing, benefits	MILK PRODUCTION LEVELS	t-test
Ho ₂ There is no statistically significant gender difference in the levels of control over milk production resources among the smallholder dairy farmers.	Levels of gender control over to milk production resources: Labour, breeding, inputs, credit, extension, marketing, benefits	Milk production levels	t-test
Ho ₃ There is no statistically significant influence in gender access to milk production resources on milk production levels among smallholder dairy farmers in Kabarnet Division.	Gender access to milk production resources: Labour, breeding, inputs, credit, extension, marketing, benefits	Milk production levels	t-test
Ho ₄ . There is no statistically significant influence in gender control to milk production resources on milk production levels among smallholder dairy farmers in Kabarnet Division.	Gender control over milk production resources: Labour, breeding, inputs, credit, extension, marketing, benefits	Milk production levels	t-test
Ho ₅ . Gender roles have no significant influence on access and control over milk production resources	Gender roles: reproductive, productive, community, constituent	Milk production levels	t-test

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

The problem that was investigated was to determine, describe and compare the influence of gender in accessing and controlling over milk production resources (labour, breeding, inputs, credits, extension, marketing and benefits) on milk production among smallholder dairy farmers in Kabarnet Division of Baringo District.

The following objectives were stated for the study:-

- (i) To describe and determine gender difference in the levels of access to milk production resources of smallholder dairy farmers in Kabarnet Division.
- (ii) To describe and determine gender difference in the levels of control over milk production resources of smallholder dairy farmers in Kabarnet Division.
- (iii) To determine the influence of gender access to milk production resources on milk production levels among smallholder dairy farmers in Kabarnet Division.
- (iv) To determine the influence of gender control over milk production resources on milk production levels among smallholder dairy farmers in Kabarnet Division.
- (v) To determine the influence of gender roles on access and control over milk production resources of smallholder dairy farmers in Kabarnet Division.

Data was collected using a validated structured interview schedule which was administered to the respondents orally in a face-to -face interview. Data was analyzed using the Statistical Package for Social Sciences (SPSS) computer program.

This chapter presents the findings of the results of data analysis and the ensuing discussions based on the formulated objectives and hypotheses. Section 4.2 looks at the general characteristics of dairy farmers in the study area. Section 4.3 presents the results on level of access to resources for milk production followed by 4.4 with results showing the level of control over the resources. Section 4.5 shows the results on gender roles followed by 4.6 with results on the influence of gender control over milk production resources on milk production levels. Section 4.7-4.9.7 presents the results on influence of gender roles on access to and control over milk production resources. The final section 5.0 presents the results of hypotheses tests.

4.2 General Characteristics of the Dairy Farmers in the Study Area

The proportion of men and women interviewed were the same as shown in Table 3. This was purposely done to avoid any bias in the results and to ensure that the findings were truly a representation of the actual situation on the ground.

Table 3:
Characteristics of the Dairy Farmers by Frequency and Percentages

Gender	Frequency	Percent
Men	53	50.0
Women	53	50.0
Total	106	100.00

4.2.1 Farm Ownership

In Table 4, majority of the respondents, that is 68 per cent owned four acres or less. The remaining 32 per cent had five or more acres of land. However, the structure of farm ownership was the same for both the women and men. This was because the unit of sampling was the household and not the smallholder dairy farmers.

Table 4:
Farm Ownership by Gender and Size by Frequencies and Percentages

Farm Sizes in Acres	Gender of Respondents			
	Men (n=53)		Women (n=53)	
	Frequency	%	Frequency	%
2 acres	17	16.1	17	16.1
3 acres	11	10.4	11	10.4
4 acres	8	7.5	8	7.5
5 acres	9	8.5	9	8.5
6 acres	8	7.5	8	7.5

4.2.2 Area under Fodder for Dairy Production

Fodder production is a pre-requisite for milk production as this has direct influence on the level of production; Table 5 shows how the land is allocated for fodder production. 41.6 per cent of the entire respondents said they had only allocated 1 acre for fodder production. Although 32 per cent owned more than two acres, only 5.6 per cent of the farmers had three acres and above

under fodder. There was no difference in area under fodder between the men and women as they belonged to the same households.

Table 5:

Area under Fodder for Dairy Production by Gender by Frequencies and Percentages

Area under Fodder	Gender of Respondents			
	Men (n=53)		Women (n=53)	
	Frequency	%	Frequency	%
2 acres	14	13.2	14	13.2
3 acres	22	20.8	22	20.8
4 acres	14	13.2	14	13.2
5 acres	1	.9	1	.9
6 acres	2	1.9	2	1.9

4.2.3 Number of Dairy Cows under Stall Feeding

Table 6 shows the average number of cows under stall feeding within the study area. Majority of the respondents, 83 per cent reported to have two or three cows under the system. Both women and men had the same number of animals under the system since they belonged to the same households.

Table 6:

Number of Dairy Cows under Stall Feeding by Gender by Frequencies and Percentages

No. of Dairy Cows	Gender of Respondents			
	Men (n=53)		Women (n=53)	
	Frequency	%	Frequency	%
1	6	5.7	6	5.7
2	27	25.5	27	25.5
3	17	16.0	17	16.0
4	3	2.8	3	2.8

4.2.4 Breeds of Animals kept by the Farmers in the Study Area

As Table 7 shows, majority of the respondents, 64 per cent, kept breeds categorized as others (crosses and local breeds). 17.2 Per cent of respondents keep Friesians, 15.0 percent Aryshires, 1.8 percent Guernseys and 1.8 percent Jersey. That agreed with the MOL&FD Annual report (2003) that majority of the dairy animals kept by the farmers are cross breeds.

Table 7:**Breeds of Animals and Ownership by Gender by Frequencies and Percentages**

Breed of Animal	Gender of Respondents			
	Men (n=53)		Women (n=53)	
	Frequency	%	Frequency	%
Friesian	9	8.6	9	8.6
Aryshire	8	7.5	8	7.5
Guernsey	1	.9	1	.9
Jersey	1	.9	1	.9
Other	34	32.1	34	32.1

4.2.5 Number of Cows in Milk

Overall, 88.6 per cent of the respondents reported to have a maximum of two cows in milk as indicated in Table 8. Despite 36 per cent of the respondents reporting to have three or four dairy cows (Table 6), only 11.4 per cent had three cows in milk.

Table 8:**Cows in Milk and Ownership by Gender by Frequencies and Percentages**

No. of Cows in Milk	Gender of Respondents			
	Men (n=53)		Women (n=53)	
	Frequency	%	Frequency	%
1 cow	24	22.6	24	22.6
2 cows	23	21.7	23	21.7
3 cows	6	5.7	6	5.7

4.2.6 Average Milk Yield per Day

The respondents who were interviewed reported to have dairy cows that produced a minimum of one litre of milk with maximum being above thirty litres per day. 73.6 per cent of the respondents were getting up to twenty litres per day with only 1.9 per cent recording over thirty litres. The results are indicated in Table 9.

**Table 9:
Average Milk Yield by Gender by Frequency and Percentages**

Average Milk Yield by Gender	Gender of Respondents	
	Men(n=53)	Women(n=53)
	Frequency	%
1 to 10 litres	30	28.3
11 to 20 litres	48	45.3
21 to 30 litres	26	24.5
31 litres and above	2	1.9
Total	106	100.0

4.2.7 Level of Milk Yield per Day

Irrespective of their gender, the level of milk production per day were the same as shown in Table 10. That was because the unit of sampling was the household composed of husband and wife. Milk production below ten litres per day was low and above twenty litres per day was a very high level of milk production.

**Table 10:
Level of Milk Production by Gender by Frequencies and Percentages**

Level of Milk Production	Gender of Respondents			
	Men (n=53)		Women (n=53)	
	Frequency	%	Frequency	%
Low (5-10litres per day)	15	14.2	15	14.2
Average(10-15litres per day)	11	10.3	11	10.3
High (15-20litres per day)	13	12.3	13	12.3
Very high (>20litres per day)	14	13.2	14	13.2

4.3 Objective 1: To determine and describe gender difference in the levels of access to milk production resources of smallholder dairy farmers in Kabarnet Division.

Based on Objective One, the respondents gave detailed account on the level of access to the various resources required for milk production by gender. There was no direct measure of

gender access to milk production resources, however, the respondents indicated a yes or no, which implied that they either accessed the resource or not. Level of access was measured using indicators of no access, little, moderate and full and numbers were assigned to each. These were later analyzed and the results given by frequencies and percentages and conclusions drawn.

4.3.1 Feeding of Dairy Animals

Generally, all the respondents indicated that they had access to feeding dairy cows as indicated in Table 11. In fact, 87.6 per cent of the respondents said that they had moderate to full access to the resource. More women, 47.1 per cent indicated that they had moderate to full access to feeding resource compared to their men counterparts at 40.5 per cent. The results are consistent with findings from IFAD (1994) and Madeley (2002) that in most African communities, women are responsible for grazing, feeding and watering animals.

Table 11:

Level of Access to Feeding of Dairy Cows by Gender by Frequencies and Percentages

Level of Access to Feeding Dairy Animals		Gender of respondents		
		Men(n=53)	Women(n=53)	Total(106)
No access	Frequency	0	0	0
	% of Total	0	0	0
Little access	Frequency	10	3	13
	% of Total	9.5	2.8	12.4
Moderate access	Frequency	33	17	50
	% of Total	31.1	16.0	47.1
Full access	Frequency	10	33	43
	% of Total	9.4	31.1	40.5

4.3.2 Breeding of Dairy Animals

The results presented in Table 12 indicated that more farmers had access to breeding according to 68.8 per cent of the respondents who indicated moderate to full access. However, 43.4 per cent of the respondents who indicated moderate to full access were men compared to only 25.4 per cent women and that 13.2% of the women respondents indicated that they had no access. The results agreed with findings by Dieckmann (1994), Schreiber (2002) and IIRR (1998) that

more often than not, women find it difficult in sourcing breeding services such as artificial insemination for their dairy animals.

Table 12:

Level of Access to Breeding Services by Gender by Percentages and Frequencies

Level of Access to Breeding		Gender of Respondents		
		Men(n=53)	Women(n=53)	Total(106)
No access	Frequency	0	14	14
	% of total	0	13.3	13.3
Little access	Frequency	7	12	19
	% of total	6.6	11.3	17.9
Moderate access	Frequency	15	17	32
	% of total	14.2	16.0	30.2
Full access	Frequency	31	10	41
	% of total	29.2	9.4	38.6

4.3.3 Inputs

According to 87.7 per cent of the respondents, the level of access to inputs was moderate to full as shown in Table13. Though more men, 46.2 per cent indicated that they had moderate to high level of access to inputs compared to 41.5 per cent women. However, there was no significant difference in the level of access to input according to both men and women, but 1.9% of women respondents indicated that they had no access compared to none of men. That was supported to some extent by IIRR (1998) findings that women generally lack necessary inputs to increase milk production.

Table 13:

Level of Access to Inputs by Gender by Frequencies and Percentages

Level of Access to Inputs		Gender of Respondents		
		Men(n=53)	Women(n=53)	Total(106)
No access	Frequency	0	2	2
	% of total	0	1.9	1.9
Little access	Frequency	4	7	10
	% of total	3.8	6.6	10.4
Moderate access	Frequency	24	30	54
	% of total	22.6	28.3	50.9
Full access	Frequency	25	14	39
	% of total	23.6	13.2	36.8

4.3.4 Credit

The level of access to credit was very little for both men and women as indicated in Table 14. Only 41.6 per cent of the respondents had access to credit. 31.2 per cent of the respondents with moderate to full access were men compared to only 10.4 per cent who were women. The results were supported by studies done by Arnon (1989), CIDA (2004), Dieckmann (1994), FAO (1997 & 2002), Madeley (2002) and Ochola (2002) that women have little access to credit facilities due to lack of collateral, cultural, traditional, institutional and sociological factors.

Table 14:

Level of Access to Credit by Gender by Frequencies and percentages

Level of Access to Credit		Gender of Respondents		
		Men(n=53)	Women(n=53)	Total (106)
No access	Frequency	12	20	32
	%	11.3	18.8	30.1
Little access	Frequency	8	22	30
	%	7.5	20.8	28.3
Moderate access	Frequency	4	7	11
	%	3.8	6.6	10.4
Full access	Frequency	29	4	33
	%	27.4	3.8	31.2

4.3.5 Extension Services

In Table 15, 58.6 per cent of the respondents indicated that they had moderate to full access to extension services with majority (34 per cent) being men compared to the 14.6 per cent who were women. The results were consistent with reports by CIDA (2004), CTA (1995), FAO (1997), Kampen and Schwarts (1992) and Oniang'o (1999) that generally, women have less access to extension services mainly due to men's strong position as heads of households and with the general belief that information men receive through extension will trickle down to the women.

Table 15:**Level of Access to Extension Services by Gender by Frequencies and Percentages**

Level of Access to Extension		Gender of Respondents		
		Men(n=53)	Women(n=53)	Total (106)
No access	Frequency	8	12	20
	%	7.5	11.2	18.7
Little access	Frequency	9	15	24
	%	8.5	14.2	22.7
Moderate access	Frequency	13	15	28
	%	12.3	14.2	26.5
Full access	Frequency	23	11	34
	%	21.7	10.4	32.1

4.3.6 Marketing of Milk

In Table 16, 89.6 per cent of all the respondents had moderate to full access to milk marketing. However, more women, 48.1 per cent of the respondents indicated that they had full access compared to 24.5 per cent who were men. The households where the women had full access to milk marketing indicated that the men had greater off-farm employment. The kind of scenario in the study area was unique as the results did not agree with findings by Dieckmann (1994), Hill (2002), Maarse (1995), MOA (1999), Niamir-Fuller (1994) that in many societies, women have access to milk and milk marketing when the quantities are small but when larger, men take control of marketing and decisions on how to utilize the income, thus depriving the women of income.

Table 16:**Level of Access to Milk Marketing by Gender by Frequencies and Percentages**

Level of Access to Marketing of Milk		Gender of Respondents		
		Men(n=53)	Women(n=53)	Total (106)
No access	Frequency	0	1	1
	%	0	.9	.9
Little access	Frequency	9	1	10
	%	8.5	1.0	9.5
Moderate access	Frequency	18	0	18
	%	17.0	0	17.0
Full access	Frequency	26	51	77
	%	24.5	48.1	72.6

4.3.7 Benefit of milk

The results in Table 17 show that virtually all the respondents, 100.0 per cent, indicated that the level of access to milk as an important food was moderate to full. That was consistent with the dietary and cultural practices of the respondents who keep livestock as a traditional livelihood activity. The results also agreed with findings by Dieckmann (1994) that dairy products are a source of quality animal protein.

Table 17:
Benefit of Milk by Gender by Frequency and Percentages

Benefits of Milk		Gender of Respondents		
		Men(n=53)	Women(n=53)	Total(106)
Little access	Frequency	0	0	0
	%	0	0	0
Moderate access	Frequency	13	1	14
	%	12.3	0.9	13.2
Full access	Frequency	40	52	92
	%	37.7	49.1	86.8

4.4 Objective 2: To determine and describe gender difference in the levels of control over milk production resources of smallholder dairy farmers in Kabarnet Division.

Based on Objective two, the respondents gave detailed account on the level of control over the various resources required for milk production by gender. There was no direct measure of gender control over milk production resources, however, the respondents indicated a yes or no, which implied that they either controlled the resource or not. Level of control over was measured using indicators of no control, little, moderate and full control and numbers were assigned to each. These were later analyzed and the results given by frequencies and percentages and conclusions drawn.

4.4.1 Animal Feeds

According to 97.2 per cent of the respondents, the level of control over animal feeds was moderate to high as shown in the Table 19. Of these, 50.1 per cent were women while 47.2 per cent were men. However, more women, 29.2 per cent, indicated that they had full control of the resource compared to 15.1 per cent who were men. In the study area, the common animal feed used by the households is Napier grass and the women respondents indicated that they controlled the resource because it was under their daily routine activities, and agreed with

findings by IFAD (1994), Madeley (2002) that it is a common norm that African women are mostly responsible for grazing, watering and feeding animals.

Table 18:

Level of Control over Animal Feeds by Gender by Frequencies and Percentages

Level of Control over Animal Feeds		Gender of Respondents		
		Men(n=53)	Women(n=53)	Total(106)
No control	Frequency	0	0	0
	%	0	0	0
Little control	Frequency	3	0	3
	%	2.8	0	2.8
Moderate control	Frequency	34	22	56
	%	32.1	20.8	52.9
Full control	Frequency	16	31	47
	%	15.1	29.2	44.3

4.4.2 Breeding

As shown in Table 19, the level of control over breeding resource was generally high according to 74.5 per cent of the respondents who indicated a moderate to full control of the resource. However, the 48.1 per cent of these were men compared to 26.4 per cent who were women simply because men in the study area usually make major decisions on breeding services as compared to the women. This was supported by studies done by Dieckmann (1994) and Schreiber (2002). 12.3 percent of women respondents had no control over the resource compared to none of men and 11.3% of women had little control as compared to only 1.9 per cent men.

Table 19:

Level of Control over Breeding by Gender by Frequencies and Percentages

Level of Control over Breeding		Gender of Respondents		
		Men(n=53)	Women(n=53)	Total(106)
No control	Frequency	0	13.0	13.0
	%	0	12.3	12.3
Little control	Frequency	2	12.0	14.0
	%	1.9	11.3	13.2
Moderate control	Frequency	11	25.0	36.0
	%	10.4	23.6	34.0
Full control	Frequency	40	3.0	43.0
	%	37.7	2.8	40.5

4.4.3 Inputs

In Table 20, 82 per cent of the respondents indicated the level of control over inputs was moderate to full. 50 per cent of these indicated that they had a moderate control over inputs. On the other hand, more men, 22.6 per cent, indicated that they had full control compared to 9.4 per cent who were women because men in the study area take most of the investment decisions as supported by IIRR (1998). It was also evidenced that 5.7 per cent women respondents had no control over the resource.

Table 20:

Level of Control over Inputs by Gender by Frequencies and Percentages

Level of Control over Inputs		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total(106)
No control	Frequency	0	6	6
	%	0	5.7	5.7
Little control	Frequency	4	9	13
	%	3.8	8.5	12.3
Moderate control	Frequency	25	28	53
	%	23.6	26.4	50.0
Full control	Frequency	24	10	34
	%	22.6	9.4	32.0

4.4.4 Credit

Only 47.2 per cent of the respondents indicated a moderate to full control over credit as shown in Table 21. Of these, 37.8 per cent were men compared to only 9.4 per cent women and on the other hand, 26.4 per cent women had no control compared to only 9.4 per cent men. As indicated earlier, the lands in the study area are registered under the men; hence provisions of credit are exclusively made to them as they have title deeds as opposed to the women who have no collateral. The results agreed with findings by Arnon (1989), CIDA (2004), Dieckmann (1994), FAO (1997, 2002), Madeley (2002) that, in most cases, the lands are registered under men.

Table 21:**Level of Control over Credit by Gender by Frequencies and Percentages**

Level of Control over Credit		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total(106)
No control	Frequency	10	28	38
	%	9.4	26.4	35.8
Little control	Frequency	3	15	18
	%	2.8	14.2	17.0
Moderate control	Frequency	4	8	12
	%	3.8	7.5	11.3
Full control	Frequency	36	2	38
	%	34.0	1.9	35.9

4.4.5 Extension Services

In terms of the level of control over extension services, 54.8 per cent of the respondents indicated a moderate to full control as shown in Table 22. However, 36.8 per cent were men while 18.0 per cent were women. Majority of women respondents, 28.3 per cent, had no control over extension services as compared to only 5.7 per cent men. The results showed that men had more control over extension services and extension information was directed to them and expected to trickle down to the women. It is a very inefficient approach and results in a considerable loss of information as supported by CIDA (2004).

Table 22:**Level of Control over Extension Services by Gender by Frequencies and Percentages**

Level of Control over Extension		Gender of Respondents		
		Men(n53)	Women(n=53)	Total (106)
No control	Frequency	6	30	36
	%	5.7	28.3	34.0
Little control	Frequency	8	4	12
	%	7.5	3.7	11.2
Moderate control	Frequency	15	15	30
	%	14.2	14.2	28.4
Full control	Frequency	24	4	28
	%	22.6	3.8	26.4

4.4.6 Marketing of Milk

From Table 23, the level of control over marketing of milk was generally high according to 95.4 per cent of the respondents indicating moderate or full control. Though there seemed not to be any gender difference in the respondents who felt that they had moderate to full control of marketing of milk, 40.6 per cent of the respondents were women compared to 20.8 per cent who were men. The results were consistent with studies done by National Dairy Development Programme (NDDP) in 1995 that women market and control the income when milk was sold locally and in small quantities. The studies also indicated that when milk production was higher, the milk was sold to cooperative societies and the husbands received and controlled the income. The results also agreed with findings by Niamir-Fuller (1994) that when income from an activity was small, it was a woman's domain, but when income became significant, men took over its management and decided on its disposal.

Table 23:

Level of Control over Marketing by Gender by Frequencies and Percentages

Level of Control over Marketing		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total (106)
No control	Frequency	0	1	1
	%	0	.9	.9
Little control	Frequency	4	0	4
	%	3.7	0	3.7
Moderate control	Frequency	27	9	36
	%	25.5	8.5	34.0
Full control	Frequency	22	43	65
	%	20.8	40.6	61.4

4.4.7 Control over milk

From Table 24 the level of control over milk was high according to 88.7 per cent of the respondents who indicated having a moderate to full control. Of these, 49.1 per cent were women while 39.6 per cent were men. More women, 43.4 per cent had full control of milk as food compared to only 8.5 per cent who were men. The results from the respondents in the study area were supported by findings from CIDA (2004), Hill (2002), Oniang'o (1999),

Oxfam (1994) and Rangnekar, et al (1991) that one of the major reproductive roles of women is on the feeding and caring for the family, hence had a higher control over the use of milk as food compared to their men counterparts. The results were also supported with studies by Bagchee (1994) and Olubandwa (1998) that women are essential to improving the nutrition of the family.

Table 24:

Level of Control over Milk by Gender by Frequencies and Percentages

Level of Control over Milk		Gender of Respondents		
		Men (n=53)	Women(n=53)	Total (106)
No control	Frequency	1	1	2
	%	.9	.9	1.8
Little control	Frequency	10	0	10
	%	9.5	0	9.5
Moderate control	Frequency	33	6	39
	%	31.1	5.7	36.8
Full control	Frequency	9	46	55
	%	8.5	43.4	51.9

4.5 Objective 3: To determine the influence of gender access to milk production resources on milk production levels among smallholder dairy farmers in Kabarnet Division.

Based on Objective three, the respondents gave detailed account on access to milk production resources and their influence on milk production levels. There was no direct measure on access to milk production resources, however, the respondents indicated a yes or no, which implied that they either accessed the resource or not. These were later analyzed and the results given by frequencies and percentages and conclusions drawn.

4.5.1 Labour

Milk production consists of basic and compulsory daily routine of cutting of fodder crops, feeding, milking and watering of animals (Niamir-Fuller, 1994). The results in Table 25 showed that, virtually all the respondents, 99.1 per cent indicated that they had access to labour for milk production. The kind of scenario in the study area where virtually all the respondents had access to labour for milk production was a unique indication that changes were taking place positively as opposed to the common norm that African women were mostly responsible

for grazing watering and feeding animals (IFAD, 1994; Madeley, 2002). According to IFAD (1994), men in some communities fed and watered animals thus agreed with the results from the study area.

Table 25:

Access to Labour for Milk Production by Gender by Frequencies and Percentages

Access to Labour for Milk Production		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total (106)
Yes	Frequency	52	43	105
	%	49.1	50.0	99.1
No	Frequency	1	0	1
	%	.9	0	.9

4.5.2 Breeding

The results presented in Table 26 indicated that 84.9 per cent of the respondents had access to breeding for milk production. However, women had difficulty in accessing the services for their dairy cows. While 49.1 per cent of those who accessed were men, only 35.8 per cent were women. The men who accessed breeding services for their dairy cows exceeded the women by 11.3 per cent. The results were in agreement with findings by Dieckmann (1994), Schreiber (2002) and IIRR (1998) that more often than not, women find it difficult in accessing breeding services such as artificial insemination for their dairy animals.

Table 26:

Access to Breeding for Milk Production by Gender by Frequencies and Percentages

Access to Breeding for Milk Production		Gender of respondents		
		Men (n=53)	Women (n=53)	Total (106)
Yes	Frequency	51	39	90
	%	49.1	35.8	84.9
No	Frequency	2	14	16
	%	.9	14.2	15.1%

4.5.3 Inputs

Intensive dairying meant greater reliance on cut and carry of fodder to stall-fed animals that required a greater input per milk unit produced, 98.1 per cent of the households interviewed indicated that they had access to inputs necessary for milk production as shown in Table 27.

However, the 1.9 per cent (2 farmers) who said they did not have access were all women. The results were supported to some extent by IIRR (1998) findings that women generally lacked necessary inputs to increase milk production.

Table 27:

Access to Inputs for Milk Production by Gender by Frequencies and Percentages

Access to Inputs for Milk Production		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total (106)
Yes	Frequency	53	51	104
	%	50	48.1	98.1
No	Frequency	0	2	2
	%	0	1.9	1.9

4.5.4 Credit

The results presented in Table 28 showed that access to credit was an issue in milk production as only 69.8 per cent of the respondents indicated that they had access. 38.7 per cent of the respondents who reported better access were men compared to 31.1 per cent who were women. Of the 30.2 per cent who said they lacked access, the majority (18.9 per cent) were women.

Table 28:

Access to Credit for Milk Production by Gender by Frequencies and Percentages

Access to Credit for Milk Production		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total (106)
Yes	Count	41	33	74
	%	38.7	31.1	69.8
No	Count	12	20	32
	%	11.3	18.9	30.2

4.5.5 Extension

From Table 29, 80.2 per cent of all respondents indicated that they had access to extension services for milk production. However, more men had access to extension as reported by 42.5 per cent of the respondents compared to 37.7 per cent who were women. The 19.8% who reported that they had no access to extension services, majority, 12.3% were women compared

to only 7.5% men. The results were consistent with reports by CIDA (2004), CTA (1995), FAO (1997), Kampen and Schwarts(1992) and Oniang'o(1999) that generally, women had limited access to extension services mainly due to men's strong position as heads of households and with the general belief that information men received through extension trickled down to the women.

Table 29:
Access to Extension for Milk Production by Gender by Frequencies and Percentages

Access to Extension for Milk Production		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total (106)
Yes	Frequency	45	40	85
	%	42.5	37.7	80.2
No	Frequency	8	13	21
	%	7.5	12.3	19.8

4.5.6 Marketing

As shown in Table 30, all the respondents indicated that they had access to marketing of milk. The participation of all respondents on marketing of milk agreed with studies done by Dieckmann (1994), Hill (2002), Maarse (1995) and MOA (1999) that when milk production was small, women had access to marketing but when the quantity become larger, men also took part.

Table 30:
Access to Marketing of Milk by Gender by Frequencies and Percentages

Access to Marketing of Milk		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total (106)
Yes	Frequency	53	53	106
	%	50	50	100

4.6 Objective 4: To determine the influence of gender control over milk production resources on milk production levels among smallholder dairy farmers in Kabarnet Division

Based on Objective four, the respondents gave detailed account on control over milk production resources and their influence on milk production levels. There was no direct measure on control over milk production resources, however, the respondents indicated a yes or no, which implied that they either controlled the resource or not. These were later analyzed and the results given by frequencies and percentages and conclusions drawn.

4.6.1 Labour

All respondents indicated that they had control over labour required for milk production as shown in Table 31. The scenario in the study area was unexpected as according to Tangka *et al* (2004), women were the dominant smallholder dairy operators in the intensive, mostly stall-feeding system of Kenya.

Table 31:
Control over Labour for Milk Production by Gender by Frequencies and Percentages

Control over Labour for Milk Production		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total (106)
Yes	Frequency	52	53	105
	%	49.1	50.0	99.1
No	Frequency	1	0	1
	%	.9	0	.9

4.6.2 Breeding

Control over breeding for milk production was high irrespective of the gender of the respondents with 86.8 per cent indicating that they had full control as indicated in Table 32. However, more men appeared to have control of the resource according to 49.1 per cent of the respondents compared to 37.7 per cent who were women, Nevertheless 12.3% of women had no control over breeding as compared to only 0.9% of men. That was in consistent with findings by Dieckmann (1994) and Schreiber (2002) that it was usually the men who make decisions on breeding services and other related decisions. In the study area where women respondents had full control over breeding, their men counterparts had off-farm employment.

Table 32:**Control over Breeding for Milk Production by Gender by Frequencies and Percentages**

Control over Breeding for Milk Production		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total (106)
Yes	Frequency	52	40	92
	%	49.1	37.7	86.8
No	Frequency	1	13	14
	%	.9	12.3	13.2

4.6.3 Inputs

From Table 33, control over inputs for milk production was high with 93.4 per cent of all the respondents indicating that they were in control over inputs for milk production. Of these, 49.1 per cent of the respondents were men while 44.3 per cent were women, 5.7% of women had no control over the resource as compared to only 0.9% of men. Although there was no great variation between gender on control over inputs for milk production, there was still evidence that men took most of the investment decisions as supported by IIRR (1998).

Table 33:**Control over Inputs for Milk Production by Gender by Frequencies and Percentages**

Control over Milk Production		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total(106)
Yes	Frequency	52	47	99
	%	49.1	44.3	93.4
No	Frequency	1	6	7
	%	.9	5.7	6.6

4.6.4 Credit

Of the respondents interviewed, 64.2 per cent indicated that they had control over credit for milk production as shown in Table 34. Of these 40.6 per cent were men while 23.6 per cent were women. More women (26.4%) indicated that they did not have control over credit for milk production as compared to 9.4% men.

In the study area, the lands were registered under the men, hence provision of credit was exclusively made to them as they had title deeds. The women respondents indicated that they could only get credit from table banking as opposed to financial institutions. The results agreed

with findings by Arnon (1989) that lack of credit prevented women from investing more on smallholder dairy improvement for improved productivity

Table 34:

Control over Credit for Milk Production by Gender by Frequencies and Percentages

Control over Credit for Milk Production		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total (106)
Yes	Frequency	43	25	68
	%	39.6	24.5	64.2
No	Frequency	10	28	38
	%	9.4	26.4	35.8

4.6.5 Extension

Of the interviewed respondents, 66.1 per cent indicated that they had control over extension services for milk production. However, only 23.6 per cent of these were women compared to 42.5 per cent who were men as shown in the Table 35. Majority of women, 26.4% had no control over extension services compared to 7.5 per cent men .The results agreed with studies by CIDA (2004) that in most societies, all household members were involved in some way or another in the dairy production but men determined the decision-making process within the family on various activities.

Table 35:

Control over Extension Services for Milk Production by Gender by Frequencies and Percentages

Control over Extension for Milk Production		Gender of respondents		
		Men (n=53)	Women (n=53)	Total (106)
Yes	Frequency	45	25	70
	%	42.5	23.6	66.1
No	Frequency	8	26	36
	%	7.5	26.4	33.9

4.6.6 Marketing

Virtually all the respondents, 100 per cent indicated that they were in control over milk marketing as shown in Table 36.

Table 36:**Control over Marketing of Milk by Gender by Frequencies and Percentages**

Control over Marketing of Milk		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total (106)
Yes	Frequency	53	53	106
	%	50	50.0	100.0
No	Frequency	0	0	0
	%	0	0	0

4.7 Objective 5: To determine the influence of gender roles on access to and control over milk production resources of smallholder dairy farmers in Kabarnet Division.

Gender roles were incorporated into the study as moderator variables because they had a direct influence on the independent variables. Activity profile was used to indicate the frequencies and percentages on how men and women performed gender roles.

4.7.0 Reproductive Roles

Reproductive roles are related to domestic or household tasks associated with creating and sustaining children and family and include bearing and caring for children, preparing food, collecting water and fuel wood, shopping, housekeeping and family healthcare done by women and are required to guarantee the maintenance and reproduction of the labour force.

4.7.1 Fetching Water

As indicated in Table 37, fetching water is a reproductive role performed often or quite often by 50 per cent of the respondents. Of these, the majority, 43.4 per cent were women compared to only 6.6 per cent who were men. 15.1 per cent of men very rarely participated in the activity. Fetching water, just like any other reproductive role is labour intensive and time consuming and is almost always the responsibility of women and girls as can be confirmed from the results and also supported by findings of Bunyata (2005) , Madeley (2002), Ochola (2002), Oniang'o (1999), Oxfam (1994), Rangneker et al (1991).

Table 37:**Fetching Water by Gender by Frequencies and Percentages**

Fetching Water		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total (106)
Very rare	Frequency	16	0	16
	%	15.1	0	15.1
Rare	Frequency	18	1	19
	%	17.0	.9	17.9
Moderate	Frequency	12	6	18
	%	11.3	5.7	17.0
Often	Frequency	6	16	22
	%	5.7	15.1	20.8
Quite often	Frequency	1	30	31
	%	.9	28.3	29.2

4.7.2 Fetching Fuel wood

From Table 38, 52.8 per cent of all the respondents were often or quite often involved in fetching fuel wood. 48.1 per cent of these were women compared to only 4.7 per cent men. 28.3 per cent of men respondents very rarely participated in the activity. As for fetching water, fetching fuel wood was also considered as women's activity in the study area and also in other African societies as supported by FAO (2004a) studies that, values, norms and moral codes embedded in culture and tradition have very strong influence on gender issues.

Table 38:**Fetching Fuel Wood by Gender by Frequencies and Percentages**

Fetching Fuel Wood		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total (106)
Very rare	Frequency	30	0	30
	%	28.3	0	28.3
Rare	Frequency	14	1	15
	%	13.2	.9	14.1
Moderate	Frequency	4	1	5
	%	3.8	1.0	4.8
Often	Frequency	2	14	16
	%	1.9	13.2	15.1
Quite often	Frequency	3	37	40
	%	2.8	39.4	37.7

4.7.3 Caring for Children

Caring for children was often or quite often being undertaken by 50.9 per cent of all the respondents as shown in Table 39. Of these, 49.1 per cent were women. Only 1.8 per cent

involved in caring for children were men. A higher percentage of men (27.4%) indicated that they very rarely took care of children, which was also an indication as earlier mentioned that caring for children was a women's activity as supported with studies by Oxfam (1994) and Oniang'o (1999).

Table 39:
Caring for Children by Gender by Frequencies and Percentages

Caring children		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total (106)
Very rare	Frequency	29	0	29
	%	27.4	0	27.4
Rare	Frequency	9	0	9
	%	8.5	0	8.5
Moderate	Frequency	13	1	14
	%	12.3	0.9	13.2
Often	Frequency	1	4	5
	%	.9	3.8	4.7
Quite often	Frequency	1	48	49
	%	.9	45.3	46.2

4.7.4 Preparing Food

Preparation of food was often or quite often undertaken by 51 percent of all the respondents as shown in Table 40. However, 49.1 per cent were women compared to only 1.9 percent men. Majority of men, 46.2 per cent rarely or very rarely participated in the activity. This was also considered as a women's activity in the study area.

Table 40:
Food Preparation by Gender by Frequencies and Percentages

Preparing Food		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total (106)
Very rare	Frequency	31	0	31
	%	29.2	0	29.2
Rare	Frequency	18	1	19
	%	17.0	.9	17.9
Moderate	Frequency	2	0	2
	%	1.9	0	1.9
Often	Frequency	0	4	4
	%	0	3.8	3.8
Quite often	Frequency	2	48	50
	%	1.9	45.3	47.2

4.7.5 House Keeping

Within the study area, housekeeping was often or quite often undertaken by about 50 per cent of the respondents as shown in Table 41. Against 0.9 per cent men, 49.1 per cent women carried out the activity. A high percentage of men, 47.1 rarely or very rarely participated in the activity. This was supported by studies done by CIDA (2004), Hill (2002), Oniang'o (1999), Oxfam (1994) and Rangnekar et al (1991) that reproductive activities were related to domestic or household tasks associated with creating and sustaining children and family and included bearing and caring for children, preparing food, collecting water and fuel wood, housekeeping and family healthcare were exclusively done by women.

Table 41:
Housekeeping by Gender by Frequencies and Percentages

House Keeping		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total (106)
Very rare	Frequency	42	0	42
	%	39.6	0	39.6
Rare	Frequency	8	1	9
	%	7.5	0.9	8.4
Moderate	Frequency	2	0	2
	%	2	0	2%
Often	Frequency	1	2	3
	%	.9	1.9	2.8
Quite often	Frequency	0	50	50
	%	0	47.2	47.2

4.8. Productive Roles

Productive roles include activities related to production of goods for consumption or income through work in or outside the home and include farming and business. Both men and women can be involved in productive activities but, for the most part, their functions and responsibilities will differ according to gender divisions of labour.

4.8.1 Cutting Fodder

Majority of the respondents were moderately or often involved in cutting of fodder for the dairy animals according to 79.2 per cent of the respondents as indicated in Table 42. However, 41.5 per cent of these were women compared to 37.7 per cent who were men. The results were consistent with findings of Ochola (2002) and FAO (1990) that women perform substantial productive work as cutting of fodder but the work is less visible and less valued than men's.

Table 42:**Cutting Fodder by Gender by Frequencies and Percentages**

Cutting Fodder		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total (106)
Very rare	Frequency	11	8	19
	%	10.4	7.5	17.9
Rare	Frequency	19	16	35
	%	17.9	15.1	33.0
Moderate	Frequency	19	16	35
	%	17.9	15.1	33.0
Often	Frequency	21	28	49
	%	19.8	26.4	46.2
Quite often	Frequency	2	1	3
	%	1.9	1.0	2.9

4.8.2 Feeding Dairy Animals

Feeding of dairy animals was carried out moderately as indicated by 44.4 per cent of the respondents as shown in Table 43. However, 47.2 per cent of all the respondents were often or quite often involved in feeding dairy animals with majority 30.2 per cent being women. Just like cutting of fodder, more women in the study area fed dairy animals compared to their men counterparts. As supported by Kpohazounder (1995) and MOA (1999), women carry out a multiple of activities that are mostly classified as non-economic.

Table 43:**Feeding Dairy Animals by Gender by Frequencies and Percentages**

Feeding Dairy Animals		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total (106)
Rare	Frequency	8	1	9
	%	7.5	0.9	8.4
Moderate	Frequency	27	20	47
	%	25.5	18.9	44.4
Often	Frequency	14	20	47
	%	13.2	18.9	44.4
Quite often	Frequency	4	9	13
	%	3.8	8.5	12.3

4.8.3 Milking and Cleaning Shed

In Table 44, milking and cleaning shed was often or quite often undertaken by 49 per cent of the respondents with 41.5 per cent being women compared to only 7.6 per cent of men. Just

like the other productive activities, women in the study area performed more work on milking and cleaning of shed compared to only a small percentage by the men. That was supported by Bunyata's (2005) findings that milking of cows was categorized as women activity

Table 44:

Milking and Cleaning Shed by Gender by Frequencies and Percentages

Milking and Cleaning Shed		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total (106)
Very rare	Frequency	13	0	13
	%	12.3	0	12.3
Rare	Frequency	21	2	23
	%	19.8	2.8	22.6
Moderate	Frequency	11	7	18
	%	9.4	6.6	16.0
Often	Frequency	6	18	24
	%	5.7	17.0	22.6
Quite often	Frequency	2	26	28
	%	1.9	24.5	26.4

4.8.4 Use of Artificial Insemination Services

Table 45 shows the respondents who mainly sourced A.I services for their dairy cows. Though 39.6 per cent of the respondents indicated often or quite often sourced A.I services, more men, and 28.3 per cent, carried out the activity. Only 11.3 per cent involved were women. In the study area, sourcing of AI services was mainly a man's activity and the 11.3% of women involved in sourcing of the service for their dairy animals was where the men were away on off-farm employment. The results were consistent with Dieckmann (1994) and Schreiber (2002) findings.

Table 45:

Use of AI Services by Gender by Frequencies and Percentages

Use of AI Services		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total (106)
Very rare	Frequency	8	10	18
	%	7.5	9.4	16.9
Rare	Frequency	7	11	18
	%	6.7	10.4	17.1
Moderate	Frequency	8	20	28
	%	7.5	18.9	26.4
Often	Frequency	21	9	30
	%	19.8	8.5	28.3
Quite often	Frequency	9	3	12
	%	8.5	2.8	11.3

4.9. Community Work

Community work include tasks and responsibilities carried out for the benefit of the community to ensure the provision and maintenance of scarce resources of collective consumption and may include building a school, clinic, repairing access roads and attending meetings. This is voluntary, unpaid work, undertaken in free time.

4.9.1 Building of Schools

Building of schools is an important community activity. Generally, majority of the respondents were involved in building of schools within the study area according to 88.7 per cent of the respondents. However, 30.2 per cent of the respondents who indicated that they often engaged in the activity were men compared to 15.1 per cent women. Evidence from reproductive and productive work showed that women spent more time in those activities and less in community work as opposed to the men who did little of reproductive and productive and more of community work in the study area as shown in Table 46.

Table 46:
Involvement in Building of Schools by Gender by Frequencies and Percentages

Building of Schools		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total (106)
Very rare	Frequency	0	1	1
	%	0	.9	.9
Rare	Frequency	0	3	3
	%	0	2.8	2.8
Moderate	Frequency	14	32	46
	%	13.2	30.2	43.4
Often	Frequency	32	16	48
	%	30.2	15.1	45.3
Quite often	Frequency	7	1	8
	% of total	6.6	1.0	7.6

4.9.2 Repair of Access Roads

Rural access roads were an important link between the study area and the outside world. They provided the means through which markets could be accessed for inputs or disposal of outputs. From Table 47, 33.9 per cent of the respondents who indicated that they often or quite often participated in the activity were men compared to only 4.7 per cent women. Though the heavy nature of the job could be the major reason why few women often engaged in the activity, the workload might also have been a limiting factor.

Table 47:**Repair of Rural Access Roads by Gender by Frequencies and Percentages**

Repair of Access Roads		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total (106)
Very rare	Frequency	2	4	6
	%	1.9	3.8	5.7
Rare	Frequency	6	26	32
	%	5.7	24.5	30.2
Moderate	Frequency	9	18	27
	%	8.5	17.0	25.5
Often	Frequency	28	5	33
	%	26.4	4.7	31.1
Quite often	Frequency	8	0	8
	%	7.5	0	7.5

4.9.3 Attending Meetings

Community meetings are important decision making forums. In Table 48, 62.2 per cent of the respondents indicated that they often or quite often attend the meetings. Though more men indicated that they often attended the meetings as they were 29.2 per cent of the respondents that was only relatively more than women who were 24.5 per cent of the respondents indicating the same. As community activities were undertaken during free time, women's workload may have contributed to the lesser percentage.

Table 48:**Attending Community Meetings by Gender by Frequencies and Percentages**

Attending Meetings		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total(106)
Very rare	Frequency	0	2	2
	%	0	1.9	1.9
Rare	Frequency	5	4	9
	%	4.8	3.8	3.6
Moderate	Frequency	10	19	29
	%	9.4	17.9	27.3
Often	Frequency	31	26	57
	%	29.2	24.5	53.7
Quite often	Frequency	7	2	9
	%	6.6	1.5	3.5
Total	Frequency	53	53	105
	%	50	50	100.0

4.9.4 Attending Ceremonies

Ceremonies are important social gatherings in the community as they enhance togetherness. In Table 49, only 38.7 per cent of the respondents indicated that they often attended ceremonies maybe due to cultural changes. The highest proportion of the respondents, who said that they often attended ceremonies, 23.6 per cent, was men compared to 15.1 per cent women. The results revealed that men in the study area played a major role in terms of ceremonies as they were responsible in making key decisions affecting the community.

Table 49:

Attending Ceremonies by Gender by Frequencies and Percentages

Attending Ceremonies		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total (106)
Very rare	Frequency	0	2	2
	%	0	1.9	1.9
Rare	Frequency	5	12	17
	%	4.7	11.3	16.0
Moderate	Frequency	11	21	32
	%	10.4	19.8	30.2
Often	Frequency	25	16	41
	%	23.6	15.1	30.7
Quite often	Frequency	12	2	14
	%	11.3	1.9	13.2
Total	Frequency	53	53	105
	%	50	50	100.0

4.9.5 Constituency Based Roles

These are managerial and leadership gender roles, which often favour men than women and are primarily undertaken by men at the constituency level, organized at the formal political, often within the framework of national politics. This is usually paid work, either directly or indirectly, through status or power.

4.9.6 Leadership

Leadership is important in providing direction and in influencing resource allocation. In the study area, the highest proportion of respondents, 22.6 per cent very rarely engaged in any leadership roles, were women as seen in Table 50. 25.5% of men often and quite often engaged in constituency leadership roles as compared to only 10.4% of their women counterparts. The results revealed that leadership roles in the study area were vested in men. These results were consistent with CIDA (2004) findings that leadership roles often favour men than women.

Table 50:**Leadership Roles by Gender by Frequencies and Percentages**

Leadership Roles		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total (106)
Very rare	Count	19	24	43
	%	17.9	22.6	40.5
Rare	Count	2	6	8
	%	1.9	5.7	7.6
Moderate	Count	5	12	17
	%	4.7	11.3	16.0
Often	Count	21	11	32
	%	19.8	10.4	30.2
Quite often	Count	6	0	6
	%	5.7	0	5.7

4.9.7 Managerial Posts

Within the study area, it appeared that individuals with managerial posts were very rare according to 59.4 per cent of the respondents as indicated in Table 51. Women appeared to be worse off as 36.8 percent of the respondents fell in this category. No women were in the often or more often category as compared to 9.5% of men. As supported by findings of CIDA (2004), managerial posts just like leadership roles often favour men than women and often organized within the framework of national politics.

Table 51:**Managerial Posts by Gender by Frequencies and Percentages**

Managerial Posts		Gender of Respondents		
		Men (n=53)	Women (n=53)	Total (106)
Very rare	Frequency	24	39	63
	%	22.6	36.8	59.4
Rare	Frequency	10	11	21
	%	9.4	10.4	19.8
Moderate	Frequency	9	3	12
	%	8.5	2.8	11.3
Often	Frequency	8	0	8
	%	8.6	0	8.6
Quite often	Frequency	1	0	1
	%	.9	0	9

4.10 Test of Hypotheses

Data were analyzed using t- test. Results of the tests are displayed in Table 52-60. Hypothesis one stated that there is no statistically significant gender difference in the levels of access to milk production resources among smallholder dairy farmers in Kabarnet Division. Data for the hypothesis was analyzed using t- test. The results in Table 52 indicated that the hypothesis was rejected (t value <0.05) and therefore the alternative hypothesis was accepted. The test compared means for two groups of cases which were then displayed in the group statistics table. If the significance value for the Levene test is high (typically greater than 0.05), the result that assume equal variances for both groups is used. If the significance value for the Levene test is low, the result that does not assume equal variances for both groups is used.

A low significance value for the t-test (typically less than 0.05) indicates that there is a significant difference between the two group means. If the confidence interval for the mean difference does not contain zero, this also indicates that the difference is significant. If the significance value is high and the confidence interval for the mean difference contains zero, then you cannot conclude that there is a significant difference between the two group means.

Ho₁ : That there is no statistically significant gender difference in the levels of access to milk production resources among small holder dairy farmers in Kabarnet Division.

In all the cases, the t-test values for the difference in the level of access to resources for dairy production had very low significant values at 95 per cent level of significance as indicated in Table 52. This shows that there is a significant gender difference in the level of access to resources for feeding, breeding, input acquisition, credit acquisition, extension services and milk marketing. Consequently, the null hypothesis that 'there is no statistically significant gender difference in the levels of access to milk production resources among small holder dairy farmers in Kabarnet Division is rejected and the alternative hypothesis accepted.

The results of mean differences further showed that men and women differed greatly in the level of access to resources for credit acquisition followed by the level of access to resources for breeding. However, the smallest difference was in the level of access to resources for inputs.

Table 52:**Results of t-test on the Level of Access to Resources for Dairy Production**

		Levene's Test for Equality of Variances		t-test for Equality of means					95% Confidence interval of the Difference	
		F	Sig.	t	df	Sig. (2- tailed)	Mean difference	Std-Error Difference	Lower	Upper
Level of access of animals feeds	Equal variances assume	.912	.342	-2.939	104	.004	-.32	.11	-.54	-.10
	Equal variances not assumed			-2.939	103.253	.004	-.32	.11	-.54	-.10
Level of access of breeding resources	Equal variances	34.892	0.000	9.941	104	.000	1.42	.14	1.33	1.70
	Equal variances not assumed			9.941	9.941	.000	1.42	.14	1.33	1.70
Level of access of input	Equal variance assumed	3.183	.077	4.221	104	.000	.62	.15	-1.50	-.92
	Equal variance not assumed			4.221	91.060	.000	.62	.15	-1.50	-.92
Level of access of credit	Equal variances	9.062	.003	7.294	104	.000	1.51	.21	.76	-1.58
	Equal variances not assumed			7.294	93.032	.000	1.16	.21	-.76	-1.58
Level of access of extension	Equal variances	1.256	.265	5.650	104	.000	1.17	.21	.76	1.58
	Equal variances not assumed			5.650	103.998	.000	1.17	.21	.76	1.58
Level of access of marketing	Equal variances	5.882	.017	-3.384	104	.001	-.38	.11	-.60	-.16
	Equal variances not assumed			-3.384	103.386	0.001	-.38	.11	-.60	-.16

Ho₂: That there is no statistically significant gender difference in the levels of control over milk production resources among the small holder dairy farmers.

Data for the hypothesis was analyzed using t- test the results displayed in Table 53. The results indicated that the hypothesis was rejected (t value<0.05) and therefore the alternative hypothesis was accepted.

Results of the t-test on the level of control over resources showed very low significant values indicating statistical difference at 95 per cent level of significance. Consequently, the null hypothesis that ‘there is no statistically significant gender difference in the levels of control over milk production resources among the smallholder dairy farmers was rejected and the alternative hypothesis accepted.

The greatest difference was observed in control over credit while the smallest was in control over animal feed.

Table 53:
t-test of level of control over various resources for dairy production

		Levene's Test for Equality of Variances		t-test for Equality of means					95% Confidence interval of the Difference	
		F	Sig	t	df	Sig.(2- tailed)	Mean difference	Std-Error Difference	Lower	Upper
Level of control of animals feeds	Equal variances assume	.912	.342	-2.939	104	.004	-.32	.11	-.54	-.10
	Equal variances not assumed			-2.939	103.253	.004	-.32	.11	-.54	-.10
Level of control of breeding resources	Equal variances	34.892	0.000	9.941	104	.000	1.42	.14	1.33	1.70
	Equal variances not assumed			9.941	9.941	.000	1.42	.14	1.33	1.70
Level of control of input	Equal variance assume	3.183	.077	4.221	104	.000	.62	.15	-1.50	-.92
	Equal variance not assumed			4.221	91.060	.000	.62	.15	-1.50	-.92
Level of control of credit	Equal variances	9.062	.003	7.294	104	.000	1.51	.21	.76	-1.58
	Equal variances not assumed			7.294	93.032	.000	1.16	.21	-.76	-1.58
Level of control of of extension	Equal variances	1.256	.265	5.650	104	.000	1.17	.21	.76	1.58
	Equal variances not assumed			5.650	103.998	.000	1.17	.21	.76	1.58
Level of control of marketing	Equal variances	5.882	.017	-3.384	104	.001	-.38	.11	-.60	-.16
	Equal variances not assumed			-3.384	103.386	0.001	-.38	.11	-.60	-.16

Ho₃: That gender access to milk production resources does not significantly influence milk production levels among smallholder dairy farmers in Kabarnet Division.

Data for the hypothesis was analyzed using t- test and the results displayed in Table 54. The results indicated that the hypothesis was accepted (t value>0.05) and therefore the alternative hypothesis was rejected.

At 95 per cent level of significant, there was no significant difference in the level of milk produced by either men or women respondents. Consequently, the null hypothesis that ‘gender access to milk production resources does not significantly influence milk production levels among smallholder dairy farmers in Kabarnet Division was accepted.

**Table 54:
Results of t-test on Level of Milk Production**

Independent Sample Test	Levene's Test for quality of variance		t-test for Equality of Means						
	F	Sig.	t	df	g.(2-tailed	Mean difference	Std.error difference	Interval of the difference Lower upper	
Milk yield per day	.006	.939	.304	104	.761	.1962	.6446	1.0820	.4744
Equal variance assumed			.304	3.992	.761	.1962	.6446	1.0820	.4744
Equal variance not assumed									
Total milk yield	.015	.904	.075	104	.941	43E-02	1.26	-2.41	2.60
Equal variance assumed			.075	3.994	.941	43E-02	1.26	-2.41	2.60
Equal variance not assumed									

Ho₄: That gender control over milk production resources does not significantly influence milk production levels among smallholder dairy farmers in Kabarnet Division.

Data for the hypothesis was analyzed using t- test and the results displayed in Table 55. The results indicated that the null hypothesis was accepted (t value>0.05) and therefore the alternative hypothesis was rejected.

At 95 per cent level of significant, there was no significant difference in the level of milk produced by either men or women respondents. Consequently, the null hypothesis that ‘gender control over milk production resources does not significantly influence milk production levels among smallholder dairy farmers in Kabarnet Division was accepted.

Table 55:
Results of t-test on Level of Milk Production

Independent Sample Test	levene's Test for quality of variance		t-test for Equality of Means						
	F	Sig.	t	df	g.(2-tailed	Mean difference	Std.error difference	Interval of the difference	
								Lower	upper
Milk yield per day	.006	.939	.304	104	.761	.1962	.6446	1.0820	.4744
Equal variance assumed			.304	3.992	.761	.1962	.6446	1.0820	.4744
Equal variance not assumed	.015	.904	.075	104	.941	43E-02	1.26	-2.41	2.60
Total milk yield			.075	3.994	.941	43E-02	1.26	-2.41	2.60
Equal variance assumed									
Equal variance not assumed									

H05-That there is no statistically significant difference in gender roles (reproductive, productive, community and constituency) among smallholder dairy farmers in Kabarnet Division.

Data for the hypothesis was analyzed using t- test and the results displayed in Table 56. The results indicated that the hypothesis was rejected (t value<0.05) and therefore the alternative hypothesis was accepted.

At 95 per cent level of significance, men and women differed in the performance of reproductive roles among the smallholder dairy farmers in Kabarnet Division. However, the greatest difference was in housekeeping while the least was in fetching water.

Table 56:**Results of t- test on Reproductive Roles**

		Levene's Test for Equality of Variances		t-test for Equality of means					95% Confidence interval of the Difference	
		F	Sig	t	df	Sig.(2- tailed)	Mean difference	Std-Error Difference	Lower	Upper
Reproductive role- fetching water	Equal variances assume	4.794	.031	-12.096	104	.000	-2.17	.18	-2.53	-1.81
	Equal variances not assumed			-12.096		.000	-2.17	.18	-2.53	-1.81
Reproductive role- fetching fuel wood	Equal variances	10.141	.002	-16.342	104	.000	-2.89	.18	-3.24	-2.54
	Equal variances not assumed			-16.342	81.16 0	.000	-2.89	.18	-3.24	-2.54
Reproductive role- caring for children	Equal variance assumed	73.736	.000	-20.599	104	.000	-3.08	.15	-3.37	-2.78
	Equal variance not assumed			-20.599	65.81 7	.000	-3.08	.15	-3.37	-2.78
Reproductive role-preparing food	Equal variances	18.756	.000	-22.840	104	.000	-3.28	.14	-3.84	-3.00
	Equal variances not assumed			-22.840	78.09 9	.000	-3.28	.14	-3.84	-3.00
Reproductive housekeeping	Equal variances	8.936	.003	-35.604	104	.000	-3.64	-10	-3.84	-3.44
	Equal variances not assumed			-35.604	96.95 1	.000	-3.64	-10	-3.84	-3.44

At 95 per cent level of significance, men and women significantly differed in the performance of productive roles that included feeding dairy animals, marketing milk, fodder collection, milking, cleaning shed and use of AI services as seen in Table 57. However, there was no significant difference in cutting fodder between men and women.

Table 57:**Results of t- test on Productive Roles**

		Levene's Test for Equality of Variances		t-test for Equality of means					95% Confidence interval of the Difference	
		F	Sig	t	df	Sig.(2- tailed)	Mean difference	Std-Error Difference	Lower	Upper
Productive role- cultivation fodder	Equal variances assume	.083	.774	- 1.708	104	.091	-.26	.15	-.57	4.25E- 01
	Equal variances not assumed									
Productive role- Feed dairy animals	Equal variances assume	0.57	.811	- 2.947	104	.004	-.45	.15	-.78	-.15
	Equal variances not assumed			- 2.947	103.995	.004	-.45	.15	-.78	-.15
Productive role- Marketing milk	Equal variance assume	7.689	.007	- 7.085	104	.000	-1.17	.17	-1.50	-.84
	Equal variance not assumed			- 7.085	93.899	.000	-1.17	.17	-1.50	-.84
Productive role-fodder collection	Equal variances assume	.026	.873	- 4.405	104	.000	-1.96	.19	-2.34	-1.58
	Equal variances not assumed			- 4.405	101.621	.000	-1.96	.19	-2.34	-1.58
Productive role-AI services	Equal variances assume	3.585	0.61	2.353	104	.021	.57	.24	8.90E-02	1.04
	Equal variances not assumed			2.353	100.447	.021	.57	.24	8.88E-02	1.04

At 95 per cent level of significance, men and women differed in the level of activity in performing community roles as shown in Table 58. However, the greatest difference was in the repair of access roads with attendance of meetings being the least.

Table 58:**Results of t- test on Community Roles**

Independent sample test	Levene's Test for quality of variance		t-test for Equality of means						
	F	Sig.	t	df	g.(2-tailed	Mean difference	Std.Error difference	95% confidence interval of the difference	
								Lower	Upper
Constituency by equal roles – Leadership assumed	11.298	.001	2.226	104	.028	.60	.27	59E-02	1.14
			2.226	98.439	0.28	.60	.27	55E-02	1.14
Constituency by equal roles – managerial assumed	26.862	.000	3.760	104	.000	.70	.19	.33	1.07
			3.769	78.155	.000	.70	.19	.33	1.07

At 95 per cent level of significance, men and women differed statistically in the performance of constituency based roles as shown in Table 59. The difference was higher in relation to managerial posts.

Table 59:**Results of t-test on Constituency-Based Roles**

Independent sample test	Levene's Test for quality of variance		t-test for Equality of means						
	F	Sig.	t	df	g.(2-tailed	Mean difference	Std.Error difference	95% confidence interval of the difference	
								Lower	Upper
Constituency by equal roles– Leadership assumed	11.298	.001	2.226	104	.028	.60	.27	59E-02	1.14
			2.226	98.439	0.28	.60	.27	55E-02	1.14
Constituency by equal roles – managerial assumed	26.862	.000	3.760	104	.000	.70	.19	.33	1.07
			3.769	78.155	.000	.70	.19	.33	1.07

From the results, it was clear that there was gender difference in the performance of reproductive, productive, community and constituency roles among the dairy farmers in Kabarnet Division. Consequently the null hypothesis that 'there is no statistically significant difference in gender roles (reproductive, productive, community and constituency) among smallholder dairy farmers in Kabarnet Division' was rejected and the alternative hypothesis accepted.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

The problem that was investigated was to determine, describe and compare the influence of gender access to and control over milk production resources (labour, breeding, inputs, credit, extension, marketing and benefits) on milk production among smallholder dairy farmers in Kabarnet Division of Baringo District. The study was necessary because it is not well understood how gender access to and control over resources influence milk production in the study area, hence the study was meant to generate empirical information which may assist policy makers in planning gender sensitive and gender responsive dairy projects.

The major findings of the study based on the objectives were as follows:

5.1.2 Characteristics of Dairy Farmers.

Within the study area, the smallholder dairy farmers seemed to be quite similar in their characteristics irrespective of gender. The farm sizes, area under fodder, number and type of dairy cows and the milk yields were generally the same for both men and women. This was because the unit of sampling for data collection was the household, composed of husband and wife and where the husband had more than one wife, one was chosen at random. The households which were composed of widows/widowers were not taken as part of the study.

5.1.3 Gender Difference in the Level of Access to the Resources for Milk Production

Based on objective one, the results of data analysis indicated that men had a higher level of access to resources for milk production as compared to their women counterparts. Specifically, men had a higher level of access to breeding services, input and credit acquisition as well as extension services. The women on the other hand had a higher level of access to feeding and marketing resources.

By subjecting the results to the t- test, the mean scores between the men and the women showed a significant difference and therefore concluded that women in the study area had lower access to the resources for milk production than their men counterparts.

5.1.4 Gender Difference in the Level of Control over Resources for Milk Production

Based on objective two, the results from the study revealed that men had a higher level of control over resources for milk production except in feeding and marketing which were highly controlled by the women. By subjecting the results to the t-test, the mean scores between the

men and women showed a significant difference, hence concluded that women in the study area had lower control over resources for milk production as compared to the men counterparts.

5.1.5 Influence of Gender Access to Milk Production Resources on Milk Production Levels

Based on objective three, the results from the study indicated that gender access to milk production resources did not significantly influence the level of milk production by the men and women although the men produced slightly more. When subjected to t-test, the mean scores between men and women showed no significant difference in the levels of milk produced.

5.1.6 Influence of Gender Control over Milk Production Resources on Milk Production Levels

Based on objective four, the results from the study indicated that gender control over milk production resources did not significantly influence the level of milk production by the men and women although the men produced slightly more. This was because the unit of sampling was the household composed of husband and wife and the dairy animals under stall-feeding were also the same. The standard deviations and t-test results showed no significant difference in the levels of milk produced.

5.1.7 Influence of Gender Roles on Access and Control over Milk Production Resources

Based on objective five, the results from the study indicated that women were more involved in reproductive and productive activities as compared to the men except in the use of artificial insemination service, which was considered a man's activity. Men on the other hand were more involved in community and constituency activities compared to the women. Although the results showed gender difference in gender roles, they did not necessarily influence access to and control over milk production resources.

5.2 Conclusions

Based on the findings of the study, the following conclusions were drawn:

5.2.1 There was significant gender difference in the levels of access to resources for milk production (labour, breeding, inputs, credit, extension and marketing) in the study area. Men had a higher level of access compared to women.

5.2.2 There was significant gender difference in the control over resources for milk production in the study area. Men had a higher control over resources for milk production compared to women.

5.2.3 Gender access to milk production resources did not significantly influence the level of milk production by the men and women in the study area because the unit of sampling was the household and the animals under stall-feeding were also the same.

5.2.4 Gender control over milk production resources did not significantly influence the level of milk production by the men and women in the study area because the unit of sampling was the household and the animals under stall-feeding were also the same.

5.2.5 Gender roles (reproductive, productive, community and constituency), did not influence access to and control over milk production resources in the study area. However, women were more involved in reproductive and productive activities as compared to the men except in the use of artificial insemination service, which was considered a man's activity. Men on the other hand were more involved in community and constituency activities compared to the women

5.3 Recommendations

From the conclusions of the study, the following recommendations have been suggested:

5.3.1 Since it was concluded that there was gender difference in the levels of access to resources for milk production (labour, breeding, inputs, credit, extension and marketing) in the study area and that men had a higher level of access compared to women. It is therefore suggested that the Government, through the National Gender Policy should sensitize fully its top management officers on gender equity for them to understand that gender is not about equality between men and women but about equity in terms of resources. There is need for the Government to recognize the contribution of women in the development agenda and be given opportunities in terms of resources so as to contribute fully to food security and increase household incomes.

5.3.2 It was concluded that there was gender difference in the control over resources for milk production in the study area. The results revealed that men had a higher control over resources for milk production. In order to realize higher household incomes and improved livelihoods, there is need to ensure that women be allowed to control production resources just like

men. Therefore, various ministries, through their Sectoral Policies on gender mainstreaming should ensure that all officers at all levels are sensitized on gender issues so as to incorporate in their development programmes so that communities get to understand their roles for increased productivity. A deliberate effort should be made by the Government to ensure that women get access to and control over resources so as to increase farm productivity, ensure family food security as well as nutrition security and incomes. This will go a long way in improving the family standards of living.

5.3.3 Although the results showed gender difference in gender roles (reproductive, productive, community and constituency), it did not necessarily influence access to and control over milk production resources. However, some of the gender roles such as reproductive and productive roles are labour intensive and time consuming and mainly done by women but the work is less visible and less valued compared to constituency based roles performed by men. It is therefore imperative that communities at large be sensitized by service providers on gender issues using gender analysis tools such as activity profile, access and control over resources and benefits so as to articulate and understand better issues pertaining to gender equity.

5.3.4 Since it was concluded that there was gender difference in access to and control over resources on milk production, it is suggested that gender integration into all extension programmes by extension providers be a continuous process for gradual attitudinal change. Experiential learning, using gender analytical tools which reveal the reality on gender issues can be used. This will go a long way in understanding that to ensure sustainability in resource management, there is need for availing equal opportunities for both men and women not only to participate but also to benefit from that development. By reducing gender inequalities and empowering both men and women would yield significant reductions in hunger and poverty within farming communities.

5.4 Suggestions for Further Research

Based on the findings and conclusions of the study, the following suggestions have been made for further research:

5.4.1 A replication of the study can be done in other districts with varied agro-ecological zones in order to compare findings and be able to make distinct conclusions.

5.4.2 A similar study using other agricultural technologies / enterprises such as cash crops/ food crops can be done in other areas to ascertain the findings.

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APPENDIX A

INTERVIEW SCHEDULE FOR HOUSEHOLDS WITH DAIRY ANIMALS UNDER STALL-FEEDING SYSTEM

SECTION A: Introduction.

Influence of gender, access and control over resources on milk production among smallholder dairy farmers in Kabarnet division of Baringo District.

Interview Schedule No..... Date.....

Instructions: You have been chosen to assist in providing information required. Please answer the questions as accurately as possible and any information provided will be treated with utmost confidentiality.

Either fill or circle appropriately as instructed.

SECTION B.

1. Gender of respondent
Key: 1 = Men 2 = Women.
2. Farm size acres
Key: 1 = 2 acres, 2. = 3 acres 3. 4 acres 4. = 5 acres 5 = 6 acres.
3. Area under fodder/pastures acres
Key 1 = ½ acre, 2 = 1 acre , 3 = 2 acres, 4= 3 acres, 5 = 4 acres
4. No. of dairy cows under stall feeding
Key: 1 = 1 cow, 2 = 2 cows, 3 = 3 cows, 4 = 4 cows
5. Breed of animal
Key: 1 = Friesian, 2 = Ayshire, 3 = Guernsey, 4 = Jersey, 5 = others (specify)...
6. No. of cows on milk
Key: 1 = 1 cow 2 = 2 cows 3 = 3 cows 4 = 4 cows
7. Milk yield per cow per day at first calving, mid-lactation..... (litres)
8. Total milk yield per daylitres
9. What is the level of milk production in your farm? (circle one only)
Key: 1 = Very low 2 = Low 3 = Average
 (< 5 litres/day) (5 - 10 litres/day (10 – 15 litres/day)
 4 = High 5 = High
 (15-20 litres/day) (>20 litres/day)

SECTION C.

Please indicate whether you have access to the following resources by using the following key
(Tick [√] the appropriate box)

Key: 1= Yes 2=No

- | | | |
|-----------------|-------|------|
| 1. Labour | Yes € | No € |
| 2. Breeding | Yes € | No € |
| 3. Inputs | Yes € | No € |
| 4. Credit | Yes € | No € |
| 5. Extension | Yes € | No € |
| 6. Marketing | Yes € | No € |
| Benefits | | |
| 7. Food | Yes € | No € |
| 8. Income | Yes € | No € |

In the table provided, circle appropriate score using the following key

KEY: 1 = NO ACCESS2 = LITTLE ACCESS 3 = MODERATE ACCESS 4. FULL ACCESS.

(Circle one only)

a) Resources	LEVEL OF ACCESS			
9. Feeding of dairy animals	1	2	3	4
10. Breeding of Dairy animals	1	2	3	4
11. Inputs acquisition	1	2	3	4
12. Credit acquisition	1	2	3	4
13. Extension services	1	2	3	4
14. Marketing of milk	1	2	3	4
b) Benefits of milk				
15. Food	1	2	3	4
16. Income	1	2	3	4

SECTION D.

Please indicate whether you have control over the following resources by using the following key (Tick [√] the appropriate box)

Key: 1= Yes 2=No

- | | | |
|--------------|-------|------|
| 1. Labour | Yes € | No € |
| 2. Breeding | Yes € | No € |
| 3. Inputs | Yes € | No € |
| 4. Credit | Yes € | No € |
| 5. Extension | Yes € | No € |
| 6. Marketing | Yes € | No € |

Benefits

- | | | |
|-----------|-------|------|
| 7. Food | Yes € | No € |
| 8. Income | Yes € | No € |

In the table provided, circle appropriate score using the following key

Key: 1 = No control 2 = Little control 3 = Moderate control 4. Full control

(Circle one only)

a) Resources	LEVEL OF CONTROL			
9. Feeding of dairy animals	1	2	3	4
10. Breeding of Dairy animals	1	2	3	4
11. Inputs acquisition	1	2	3	4
12. Credit acquisition	1	2	3	4
13. Extension services	1	2	3	4
14. Marketing of milk	1	2	3	4
b) Benefits of milk				
15. Food	1	2	3	4
16. Income	1	2	3	4

SECTION E.

In the activity profile provided, indicate how often you perform the following tasks using scale provided: key: 1 = Very rare, 2 = Rare 3 = Moderate 4 = Often 5= Very often (circle one only).

Activity	
Reproductive roles	
1. Fetching water	1 2 3 4 5
2. Fetching fuelwood	1 2 3 4 5
3. Caring for children	1 2 3 4 5
4. Preparing food	1 2 3 4 5
5. Housekeeping	1 2 3 4 5
Productive roles	
6. Cutting fodder	1 2 3 4 5
7. Feeding dairy animals	1 2 3 4 5
8. Marketing of milk	1 2 3 4 5
9. Fodder collection	1 2 3 4 5
10. Milking and cleaning shed.	1 2 3 4 5
11. A.I services	1 2 3 4 5
Community roles.	
12 Building a school	1 2 3 4 5
13 Repair of access roads	1 2 3 4 5
14 Attending meetings	1 2 3 4 5
15 Attending ceremonies	1 2 3 4 5
Constituency-based roles	
16 Leadership	1 2 3 4 5
17 Managerial posts	1 2 3 4 5