



Implications of gender discrimination for household food security among small holder dairy farmers in Nakaloke, Mbale District, Uganda

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Abstract

Available evidence shows that there exists a strong mutual relationship between gender discrimination and household food insecurity. Marginalization of women who are believed to be the custodian of household food security has a great influence on the food security status of households in most communities of Uganda. This study was undertaken to determine the implications of gender discrimination for household food security among smallholder dairy farmers in Nakaloke Sub County - Mbale district. Great focus was on the gender roles and their implications for food security, pattern of access to and ownership of production resources by different genders and their decision making powers in terms of use of production resources and the benefits thereof. Primary data was collected from 96 respondents in the 3 parishes of Nakaloke Sub County using questionnaires and it was analyzed using Microsoft excels. On average, 18% men, 49% women, 5% boys and 1% girls participated in all milk production activities. In 27% of the interviewed households, dairy production activities were carried out jointly. Ownership of the production resources was predominantly vested in men; 71% and 81% men owned cattle and land respectively. Decision making powers in terms of use of production resources and the benefits thereof were also predominantly vested in men. Households where men and women jointly shared the livestock production activities produced more litres of milk and were more food secure than households where either men or women performed the activities single handedly. The study also revealed that households where women owned the production resources such as land and cattle were more food secure than those where these resources were owned and controlled by men.

Keywords: Gender, Gender discrimination, Food security, Small holder dairy farmers.

Introduction

The dairy sector remains a significant component to the development of Uganda's economy because of its enormous contribution to rural poverty reduction, economic development and promoting household food security and nutrition¹⁻⁴. Uganda's dairy sector is highly dominated by smallholder dairy farmers who own a few cows consisting mainly of local breeds or their crosses grazed on small hectares of land⁵⁻⁷. Women form a big percentage of the labour used in Uganda's dairy farming and they contribute significantly to ensuring household nutrition and food security. However, one of the constraints women face while executing their duties in dairy farming is gender discrimination. This gender discrimination expressed in form of limited access to and control over the production and financial resources inhibit dairy farming productivity and reduce food security⁴.

Gender refers to socially and culturally constructed roles, responsibilities, constraints, opportunities, perceptions, attributes and expectations assigned to women, men, girls and boys within the same household and between different cultures and societies^{8,9}. Gender discrimination is defined as any kind of segregation people face on the basis of their gender that

prevents them from enjoying their full freedom as humans¹⁰. Gender discrimination is synonymous with all types of gender i.e. men, women, boys and girls. However, majority of people who are discriminated against their gender in Uganda are women and girls¹⁰. Uganda through policies and laws enacted by the government and international bodies to fight gender discrimination through women empowerment programs, has attained tremendous progress in promoting gender equality across the country. More women have attained education and are in decision making positions. However, when individual sectors are analysed, marginalization of women still exists in most parts of the country^{11,12}. Gender discrimination in Uganda takes several dimensions and is largely influenced by cultural factors. This discrimination ranges from what women shouldn't eat to lack of powers to make decisions and access to and ownership of production resources¹². Discrimination against gender is more prevalent in Uganda's rural areas than in urban areas which is attributed to rural men's lack of employment opportunities resulting into alcoholism and idleness¹².

Constraints faced by the different gender groups in dairy farming: The roles and responsibilities of the different gender groups in dairy farming vary according to region, country, and community depending on the different economic, social and

cultural conditions¹³. Despite being marginalized, women greatly contribute to agriculture in Uganda and sub saharan Africa at large. In sub saharan Africa, agriculture employs over 60% of women and out of the world's 600 million small livestock farmers, over 65% are women^{14,15}. Over 70% of Uganda's labor force works in the agricultural sector and the greatest percentage of this is made up of women who constitute 80% of the total labour force in Uganda's agriculture^{16,17}. Rural women in Uganda on average spend more hours working than men. They spend around 12-18 hours per day working compared to 8-10 hours per day spent by men⁸. The challenges faced by rural women and men in terms of gender in dairy farming can be categorised into seven groups as described below:

Ownership of production resources: Women contribute significantly to agriculture and household food security. Available evidence shows that it's women, boys and girls who work more on the farms than the men^{9,18}. However, despite this contribution, the greatest percentage of women do not own production resources such as land. According to UBOS and MGLSD (2019), production resources such as agricultural land are majorly owned by men who have the powers to decide on what the land will be used for. An estimate of only about 4% of rural land in Uganda is owned by women^{9,19}. Women's lack of ownership of land limits their ability to develop, manage and improve livestock activities because it often translates into lack of land for grazing and collateral to access credit for investment^{13,14}.

Gender roles: Men, women, boys and girls take part in several activities of smallholder dairy production in Uganda. In traditional African societies, large animals such as cattle were often owned by men while women, boys and girls owned small livestock species such as poultry and small ruminants. Recent researches however, show that gender roles have changed over time. Nowadays women also perform tasks that were previously considered to be men's tasks. In most societies, women also take care of large animals such as cattle. However, men rarely perform women's tasks except when they expect to gain control over the benefits from the activity. As an example of this, it's common for men to take up milking activities during periods when more profits are expected from milk production^{10,20,21}.

In most Ugandan societies, milking animals, collecting and processing milk is fully a responsibility of women. Women's roles in livestock production is estimated to be over 75% of livestock related activities such as feeding, animal care, and milking²². Children are often involved in dairy cattle management activities such as grazing and watering. Girls are commonly more involved in tending dairy animals while young boys tend to be engaged in grazing animals. Despite women being responsible for managing milk production in most Ugandan societies, they lack ownership of and control over the milking cows. Women's lack of ownership of the milking cows influences their participation in decision making in relation to

the sale of the cows as well as the use and sale of milk and milk products^{10,20,21}.

Access to technologies, information and extension services: In most societies in Uganda, women are responsible for all household tasks such as housework, taking care of children and farming related activities. Because of the work burden as a result of these tasks, women have limited time to participate in extension activities. According to some customary rules and traditions, women are also not allowed to leave the house without permission from their husbands. As a result, they face it hard to participate in extension meetings or group training activities on topics such as animal husbandry, veterinary practices and credit systems^{13,14,20}.

Access to credit and financial services: Since women lack ownership of the resources of production such as land, they lack collateral which makes it harder for them to access credit than men who control such resources. Inaccessibility of women to credit prevents them from expanding enterprises, prevents them from hiring needed employees and also limits their use of technology¹³. An analysis of the beneficiaries of the Agricultural Credit Facility (ACF) in the fiscal year 2014/15 shows that 64% of the borrowers were men, 9% were women and 27% were both men and women (joint). The ACF is a loaning scheme established by Uganda's government with the aim of providing subsidized credit to farmers. Among the reasons why women benefited less from the program were lack of collateral security to get loans and lack of access to financial information^{8,23}.

Access to markets: Despite playing a major role in livestock production, women often have limited access to markets for livestock and livestock products than men. This is attributed to poor marketing skills, low levels of education and customary rules that prevent women from freely leaving the house premises without permission from their husbands. As a result, there are often inequalities between men and women when it comes to sharing the benefits obtained from livestock production^{10,13}.

Participation and decision-making power: Customary laws prevent women from actively engaging in decision making. Religious beliefs also emphasise this by restricting women from exercising authority over men, teaching them to be submissive to their husbands. Such rules and beliefs give women limited powers to make decisions when it comes to the use of production resources and income obtained from livestock activities^{13,16}.

Occupational health and safety: Coming into close contact with animals daily and handling of animal products in their raw form exposes men and women to several health risks such as salmonellosis and zoonotic diseases like brucellosis. Because women participate in several livestock activities such as milking animals and processing the milk and are the main handlers of

animal products for both family consumption and sale, they are greatly exposed to such diseases than men^{13,20,21}.

Despite being the main driving force in agriculture because of the considerable amount of time they spend doing agricultural activities, as a result of the above constraints, productivity of women in agriculture is often lower than that of men. According to the available evidence, the efficiency units lost in agricultural productivity if a worker is a woman holding other factors such as age, education, experience and hours worked constant ranges from 4-50% worldwide and 20-30% in the Sub Saharan Africa²⁴. In Uganda, this gender productivity gap is estimated to be 30.6% and closing this gap will yield production gains of 10.3%. These production gains would subsequently increase the monthly consumption per adult by 10.7% and would help over 13% households headed by women move out of poverty in Uganda²⁴. If the constraints women face in terms of access to production inputs could be addressed, they are likely to be as efficient as the men thereby closing or at least reducing the gender productivity gap. According to FAO, if agricultural lands owned by women were to use the same quantities of inputs like in those owned by men, output from agriculture in developing countries would be raised by 2.5-4% on average. The number of malnourished people would also consequently decline by 12 – 17%^{24,25}.

Food security: Food security refers to a condition when people can physically, socially and economically obtain safe and nutritious food at the desired time, and in quantities sufficient enough to cater for their nutritional requirements and food desires necessary for good health and an active life^{3,20-22,26,27}. On the other hand food insecurity is used to refer to a condition when people have limited access to nutritionally adequate and safe foods²⁸. Food insecurity is said to be a political and economic issue attributed to unfair international and national laws. It is also said to be an environmental issue because of the increasingly unsustainable methods of agriculture and livestock farming that lead to environmental pollution thereby contributing to climate change and food insecurity. On addition to being a political, economic and environmental issue, food insecurity is also said to be a gender dimension issue²⁹. Available evidence shows that there exists a strong mutual relationship between gender discrimination and food insecurity^{27,29}. Countries that are ranked highest on the global hunger index are also those where gender inequalities are more severe^{22,27}.

At least 805 million people are said to have experienced extreme, chronic malnourishment between 2012 and 2014 despite the fact that food enough to feed everyone is produced worldwide and at least 60% of these were women and girls^{27,29}. This is attributed to the gender discriminatory social and cultural norms that prevail in societies thus neglecting the food security and nutrition needs of women and girls at the household level²⁷. Despite being constrained by several factors such as lack of ownership of resources of production, over 90% of the total

output of food in Uganda is produced by women. Over 19.5% of Uganda's population is considered to be food insecure and this is attributed to the constraints women face in the production of food³⁰.

Components of food security: There are four components of food security as identified during the World Summit on Food Security in 2009^{20,21,27,29}. These components include food availability, accessibility, utilisation and stability. On addition to playing a central role in a wide range of activities in agriculture, women also contribute significantly to these four components of food security²¹. Men also play significant roles in these components, however, the barriers they face are fewer compared to women. Men have more opportunities to access resources of production such as land, credit, information, technology and extension services than women²⁰.

Food Availability: Food must be consistently available in sufficient quantities to and within the reach of all individuals in the society. This availability can be either in terms of adequate level of food production whereby enough food required by the population is produced or in terms of having enough resources to buy or acquire the food at the required time. Women and sometimes girls play roles in ensuring food availability by getting involved in food production, processing and distribution. Despite most of their work being unpaid and unrecognized, women contribute significantly to food security. They comprise over 80% of the labour used in food production in most of the Sub Saharan countries^{20,21}.

In dairy production, women contribute to food production through activities such as; feeding and providing water to the cows, providing shelter, payment for treatment and breeding costs, milking cows among others. However, limited ownership of resources of production constrain women in their contribution to food production^{20,21}. Despite contributing greatly towards household food security and wellbeing through their efforts in dairy production, women's roles in dairy production are often referred to as being helpers to male households³¹.

Food Accessibility: The mere presence of food in the society does not guarantee the ability of a person to access and consume it. Food accessibility therefore means that all individuals of the society must be physically, socially and economically able to acquire enough food that meets their needs. This literally implies that every individual must be able to produce or purchase enough food required for their daily nutritional needs. In most societies, gender relations determine greatly people's access to food. Even when food is available and could be accessed by everyone, inequalities in gender often affect it's fair distribution in the household. Women and girls often suffer from food insecurity whereas men and boys receive their desired nutritious food in the required quantities. People's access to food is also often hindered by the high rates of poverty and women comprise the majority of the poor globally. This owes to the fact that most of their labour in family farms or

other activities is not paid for and those that are paid for have very low wages. This therefore means that women have the least production and financial resources to improve their food security statuses^{20,21}.

Food Utilisation: This means the effective use of food to cater for individual's nutritional requirements. It also encompasses health and hygienic practices during food processing and storage. Gender differences also exist in the utilisation of the available food. The varying nutrition needs of girls and women during their different stages of growth are often ignored in societies. This exposes women and girls to nutrition deficiencies than men and boys^{20,21}.

In households practicing dairy production in many parts of Uganda, it is the role of women to locally process milk into products such as yoghurt and butter. Food processing is also a role of women in many societies and therefore women greatly contribute to the nutritional needs of the individuals in their households. Despite women contributing greatly to food utilization, they are said to be more undernourished than men which is a clear indicator of gender discrimination²⁰.

Stability of food: This means a stable supply of food throughout the year. Food stability also means having enough storage capacities of food or other strategies of saving in preparation for emergencies. Food stability and supply is hindered by climate change and macroeconomic policies in trade that have led to food insecurity in many countries. Women are particularly badly affected in times of unstable food supply. In such times women reduce their own food intake leaving the rest for their families and also expend more energy to make sure enough food is available in the household²⁰.

While several researches have been conducted on several gender issues in agriculture and their impact on household food security worldwide, little research has been conducted about the same in the study area. The overall objective of this paper was to determine the implications of gender discrimination for household food security among smallholder dairy farmers in Nakaloke, Mbale district. The specific objectives of the research were to examine gender roles and their implications for food security and determine pattern of access to and control over resources of production by different gender groups in smallholder dairy producing households of the study area. This was intended to add to the existing information in the areas of gender and food security and thereby aid in the fight against discrimination in gender. Fighting gender discrimination in agriculture is crucial in promoting both economic growth and food security because gender equality is the major determining factor of food security^{16,32}. According to UBOS (2019), agriculture contributes 21.9% to Uganda's GDP, the dairy sector alone contributes 3.5% to Uganda's GDP and is a source of livelihood for over 58% of the population^{5,6,33}. Therefore, if Uganda could harness the full potential of its agricultural sector and in particular the dairy sector by eliminating gender

discrimination, the benefits at household and national levels would be significant. There are several benefits to be achieved if discrimination against gender is reduced. Available research suggests that increasing women's ownership of resources such as finance is likely to expand their yields from agriculture by 20 to 30%, increase the national agricultural production by 2.5 to 4% and reduce the number of undernourished people by 12 to 17%. Providing men and women equal access to vocational training and technology is also likely to expand Africa's economy by at least 40%²⁰.

For the transformation of gender roles and gender equality to be initiated, there is a great need of information about the inequalities and constraints facing the different gender groups. This study was undertaken to generate information about the likely impact on smallholder dairy production and household food security of empowering all genders especially men and women alike in the ownership of resources of production. This information will help policy makers, development organizations, government and Non-government Organizations address the gender issues in the study area for proper formulation of policies that will address all these issues. The remaining sections of this article were organized as follows. The next section explains the study area, study design, the materials and methods for data collection and analysis. These are followed by a presentation of the results from the study and lastly the discussion of the results, conclusions and recommendations.

Methodology

Description of the study area: This research was carried out in the 3 parishes of Nakaloke Sub County from February to April 2016. Focus was laid mainly on gender roles and ownership of resources of production by the different gender groups among smallholder dairy producing households. Nakaloke Sub county is found in Bungokho County North Constituency in Mbale district. Mbale district is a district found in Uganda's Eastern region, Bugisu Sub region having a population estimated to be 492,804 people according to the 2014 national population census³⁴. It's bordered by Sironko, Bududa, Manafwa, Tororo, Butaleja and Budaka districts to the North, Northeast, Southeast, South, Southwest and West respectively. Pallisa and Kumi districts lie to the Northwest of Mbale District³⁵. Nakaloke sub county is made up of 3 parishes and 33 villages and has a population of 28,700 people. The parishes include; Nakaloke, Namabasa and Namunsi³⁶.

Primary data used in the study was obtained through focused group discussions and questionnaires made of multiple choice questions and open ended questions that were issued to smallholder dairy producing households. As categorised by Cicek and Tandogan 2008, smallholder dairy farmers were those farmers that owned 1 to 15 cows³⁷. They kept majorly local cattle breeds that were grazed on small hectares of land and had traditional systems of production³⁸.

Sampling design and Sample size determination: A list of all the villages in Nakaloke Sub County together with the smallholder dairy producing households were obtained from the sub county and then probability sampling was used to select the villages from each parish. The names of all the villages were written on paper slips and put in a box. They were then thoroughly mixed and the required number of slips was picked one after the other without replacement. Judgment sampling was used to select households since the study required households that only kept cattle and on a small scale.

According to data provided by UBOS, Nakaloke Sub County has around 788 households that rear cattle^{39,40}. A total of 96 Households were purposively selected for the study as calculated from the standard formula adapted from Israel Glenn 1992⁴¹; a 10% degree of error margin was used.

Formula, $n = \frac{N}{(1+Ne^2)}$ Where, n = Required sample size, N = Total number of Households and e = Degree of error margin (0.1). Therefore, $n = 788 / (1+788 \times 0.1^2) = 89$. After getting the total number of respondents, the same formula was used to get the number of villages to be sampled. The sub county has 33 villages; So using $n = \frac{N}{(1+Ne^2)}$ where N = 33, $n = 33 / (1+33 \times 0.1^2) = 24$ villages in the whole sub county. The sample size was adjusted to 96 households to equally fit the 24 villages selected for the study.

However, each parish has a different number of villages; Namunsi has 8 villages, Nakaloke 16 villages and Namabasa 9 villages³⁶. So to get the number of villages to be sampled from each parish, the following formula was used;

Number of villages to be sampled in each parish

$$\frac{\text{Total number of villages in the parish} \times \text{Total number of villages to be sampled in the sub county}}{\text{Total number of villages in the sub county}}$$

Where; Total number of villages in the sub county = 33 and total number of villages to be sampled in the sub county = 24.

Using the above formula, 6, 12 and 6 villages were sampled in Namunsi, Nakaloke and Namabasa parishes respectively. A total of 4 households were interviewed from each village as calculated from $96/24 = 4$ households where 96 was the sample size for the whole sub county and 24 was the number of villages sampled in the sub county. The collected data was analyzed using Microsoft office excels since only quantitative data was collected.

Measuring status of food security: There is no single factor used for measuring food security²⁸. However, as explained by Bickel, Nord et al, the status of household food security was established by gathering information on a several conditions such as frequency of meals and type of foods eaten by the household in a day. Bickel, Nord et al categorized food security

status into three groups²⁸. This categorization includes; food secure, food insecure without hunger and food insecure with hunger.

Food secure: This is when there is either completely no signs of food insecurity in households or food insecurity signs are available but at very minimal levels.

Food insecure without hunger: This is evident when there is inadequate supply of food in the household and household members adjust to this inadequacy through reducing the food quality eaten and increase coping strategies. However, apart from the quality of food eaten, the quantity of food eaten by members in the household is not reduced.

Food insecure with hunger (moderate): Only adults in the household reduce their intake of food to the extent that they repeatedly feel hungry.

Food insecure with hunger (severe): All members of the household including children reduce their food intake to the extent that they experience hunger. However, for purposes of this research, moderate and severe food insecurity with hunger were combined into a single group which is “Food insecure with hunger”.

Results and discussion

Demographic and Social economic characteristics of respondents: Out of the 96 respondents, 50% were male and 50% were female; of these, 81% of the households were under the headship of men while only 19% were under the headship of women. The results further revealed that 85% of households owned 2 to 3 heads of cattle while 15% owned 4 to 5 heads of cattle. When it comes to the breeds of cattle owned, 28% of the interviewed households owned only purely local cattle, 22% owned only cross breeds, 23% owned only purely exotic breeds, 14% owned both local and cross breeds, 13% owned both cross and exotic breeds. The results show that 81% of households kept cattle purposely for milk production and 19% kept cattle for both milk production and beef production. The greatest percentage of the households (69%) depended on both crop farming and livestock farming, 17% depended on livestock farming alone, 7% depended on both livestock farming and business.

According to the results, 13% of the interviewed households obtained 1 to 5 litres of milk from their milked cows, 29% obtained 6 to 10 litres, 46% obtained 11 to 15 litres and 13% obtained 16 to 20 litres of milk daily. These litres were not on a per milked cow basis but they were a total of milk obtained from all milked cows in a household on a daily basis. The milk produced was always either consumed by the household or part of it sold and the remaining part consumed. The results of the study revealed that 19% households consumed all the milk without selling while 81% households always sold part of the

milk and consumed the remaining part in the household. Out of the 81% households who both sold and consumed their milk, 19% used the money from the sale of milk to buy food alone while 81% used the money to buy food, pay school fees and family and animal health care.

When it comes to the size of land owned by the interviewed households, 92% of households owned 1 to 5 acres of land while only 8% owned 6 to 10 acres of land. The study further revealed that ownership of resources of production was predominantly vested in men whereby 71% men and 29% women owned the cattle; 81% men and 16% women owned land and 3% of the land was owned by the clan.

Decision making: Decisions were always made majorly on the use of milk and money from it’s sale and the sale/hire out of land and the use of money thereof. Results from the study revealed that 56% men and 41% women decided on the use of milk and money from it’s sale. When it comes to the sale/hire out of land and use of money thereof, 81% men, 16% women and 3% clan decided on the sale/hire out of land and use of money thereof.

Gender distribution of dairy production activities among smallholder dairy farmers in Nakaloke Sub county: As shown in Tables-1,2,3, 4 below, women’s participation in all dairy production activities outweighed all other genders. Almost all dairy production activities were predominantly carried out by women.

Table-1: Gender participation in Cutting and feeding fodder to animals, grazing animals and watering among smallholder dairy farmers in Nakaloke Sub County.

Gender Group	Activities			
	Cutting/ Collecting Fodder (%)	Feeding Fodder (%)	Grazing Animals (%)	Watering (%)
Man	6	3	11	12
Woman	53	52	39	50
Boy	11	5	13	3
Girl	0	0	0	0
Joint	30	40	37	35

Table-2: Gender participation in the cleaning of the cattle shed, providing beddings and constructing the animal houses among smallholder dairy farmers in Nakaloke Sub county.

Gender Group	Activities		
	Cleaning the cattle shed (%)	Providing beddings (%)	Constructing the animal houses (%)
Man	9	12	51
Woman	55	55	21
Boy	0	0	8
Girl	0	0	0
Joint	36	33	20

Table-3: Gender participation in milking, selling milk and record keeping among smallholder dairy farmers in Nakaloke Sub county.

Gender group	Activities		
	Milking (%)	Selling milk (%)	Record keeping (%)
Man	20	20	20
Woman	46	62	46
Boy	2	8	2
Girl	3	0	3
Joint	29	10	29

Table-4: Gender participation in treatment, caring for; lactating cows, cows during parturition, calves and taking cows for mating among smallholder dairy farmers in Nakaloke Sub county.

Gender groups	Activities				
	Treatment (%)	Caring for lactating cows* (%)	Caring for cows during parturition (%)	Caring for calves (%)	Taking cows on heat to be served (%)
Man	27	19	19	10	37
Woman	52	53	53	52	40
Boy	2	2	2	2	11
Girl	0	0	0	0	0
Joint	19	26	26	36	12

*Caring for lactating cows applies to those that are kept separately away from the main herd

On average, 18% men, 49% women, 5% boys and 1% girls participated in all the dairy production activities. In 27% of the interviewed households, dairy production activities were carried out jointly.

Food security status of the interviewed households: Food type eaten in the household: The study revealed that 5% of the households had one meal each day, 25% had two meals and 70% had three meals each day. Furthermore, 29% households ate enough of the types of food they always wanted, 26% ate enough food but not always the types of food they wanted, 41% occasionally did not have enough food and 4% didn't have enough food to eat often. All the households that did not have enough food to eat and those that did not have the kinds of food they always wanted to eat was because they lacked enough financial resources to buy the desired food.

Status of food availability in households of respondents: The study revealed that 35% of the households often worried about their food getting finished before they could get money to buy more. Furthermore, 39% sometimes worried but not often and 26% never worried about their food getting finished before they

could get money to buy more. In 34% households, their food did not often last and they had no money to get more, in 37% households, their food did not last some times and they had no money to get more while 29% households had their food last and they had money to get more. The study further revealed that 39% households often did not afford balanced meals, 32% households sometimes did not afford balanced meals and 29% households could afford balanced meals.

Meals uptake by respondents' households in the previous 12 months: The study revealed that 64% households reduced the quantity of the food eaten and or skipped meals in the previous 12 months, 36% households never reduced their feed intake in the previous 12 months. Of the 64% (61) households who reduced their feed intake and or skipped meals, 23% households skipped meals every month while 77% households skipped meals some months but not every month.

Furthermore, 47% households had ever failed to eat for a whole day in the previous 12 months because they lacked money to buy food and 53% households had never failed to eat for a whole day. And lastly 20% households failed to eat for the

whole day in every month while 80% households failed to eat for a whole day in some months but not every month.

In summary, results from the study show that 31% households were food secure, 35% households were food insecure without hunger and 34% households were food insecure with hunger as categorized by Bickel, Nord et al²⁸.

Ownership of production resources and food security: As shown in Table-5, households where land and cattle were owned and controlled by women were more food secure than those where they were owned and controlled by men.

Gender roles, milk production and food security: The study revealed that milk production was higher for those households where the livestock activities were carried out jointly than for those households where either men or women performed the activities single handedly. Furthermore, households where men and women shared the livestock activities were more food secure than those households where either the man or woman performed the activities single handedly.

Discussion of Results: Social economic characteristics of households: According to the results above, there is men dominance in household headship whereby 81% of the interviewed households were under men headship whereas only 19% were under the headship of women. Male dominance in household headship is in agreement with UBOS (2012) where it was found out that 89% of the households in Nakaloke Sub County were headed by men³⁹. From the study, most of the interviewed households (85%) owned 2 to 3 heads of cattle. This is in agreement with FAO’s and Tijjani’s studies where it

was found out that the greatest percentage of Uganda’s cattle keeping households are small scale subsistence farmers keeping small herds of less than 5 cattle heads^{5,6}.

According to the results, smallholder dairy keeping households in Nakaloke depend on milk for either household consumption or sale to obtain money for food. Results from the study show that 19% households consumed all the milk produced in the household while 81% both sold and consumed the milk produced. Money from the sale of milk was used to buy food, pay school fees and family and animal health care. Almost all interviewed households use all or part of the money from the sale of milk to buy food. This is a clear indicator of the contribution of milk to household welfare in terms of food security. Results also prove that smallholder dairy keeping households in the study area own small pieces of land where it was revealed that 92% of the households owned 1 to 5 acres of land. This nature of land ownership supports Tijjani’s review where it was found out that the largest percentage of Uganda’s dairy farmers own on average 2-3 hectares acres of land⁶.

Gender roles in dairy production activities: Results from the study show that women’s roles dominate the dairy production activities. The greatest percentage of activities are carried out by women single handedly. These findings corroborate several studies that show that women are dominant in livestock farming activities than men despite having limited access to production resources. Women play a significant role in provision of labor for livestock production activities participating in all activities even those regarded culturally as male activities such as grazing, construction of animal houses^{10,13,20-22}.

Table-5: Food security status of households by ownership of production resources among smallholder dairy farmers in Nakaloke Sub county.

Production resource	Level of ownership Percentage of men	Food security status of households where resources were owned by men		
		Food secure	Food insecure without hunger	Food insecure with hunger
Cattle	71	29	25	46
Land	81	26	24	50
Production resource	Level of ownership Percentage of women	Food security status of households where resources were owned by women		
Cattle	29	36	25	39
Land	16	47	40	13

*3% of the land was owned by the clan.

Gender roles, milk production and implications for food security of households: Besides gender distribution of roles of

livestock related activities, the study revealed that milk production was influenced by other factors such as breeds and

numbers of cattle owned by a household. However, the study revealed that milk production was higher for those households where both men and women shared the activities related to milk production than for those households where either men or women did the activities single handedly. In the households where men and women shared the livestock activities, with all other factors such as breeds and numbers of animals kept constant, daily milk production was always between 16 to 20 litres compared to the households where either men or women performed the activities single handedly. Food security was also influenced by other factors besides gender distribution of roles such as size of land owned by the household since most of the households depended on both crop farming and livestock production. However, households where men and women shared the activities related to milk production were more food secure than those households where either the man or woman performed the activities alone.

Ownership of production resources: The findings of the study revealed that ownership of land and cattle is predominantly vested in men. This agrees with several studies where women were found to lack access to and ownership of production resources because of the male dominance^{9,19}. This fact is also similar to findings from several countries where studies have been conducted. In Ghana for example, women were found to hold land in only 10% of the households⁴². In Nepal women were found to own land in only 14% of the rural households that owned land⁴³. This constrained access to production resources further limits participation of women and their efficiency in livestock production^{13,14}. Dominance by men in cattle ownership reflects male dominance of dairy production in Nakaloke Sub County. These findings highlight gender disparities in cattle ownership among households, the women being disadvantaged. Furthermore, men also dominate decision making when it comes to disposing off and use of benefits from the production resources. Male dominance in disposal and control over use of benefits from the cattle products is evident in all the households. It's only among female headed households where women control the disposal and use of benefits from cattle.

Decision making among interviewed households: The study showed that men take part in most of the decisions and women have less powers in decision making. This is similar to several findings that emphasize the fact that women are often subordinate to men when it comes to decision making. Men dominate decision making in terms of the use of the production resources such as land, use of benefits from the sale and hire out of land and the use of benefits from dairy production^{13,16}.

The food security status of households depended majorly on ownership of the factors of production. Households with more heads of cattle and large acres of land were more food secure than those with few heads of cattle and few acres of land. Ownership of production resources by women was also found to be a positive contributor to household food security. Households where production resources were owned and controlled by

women were more food secure and had less incidences of hunger than those where the production resources were owned and controlled by men. This corroborates the findings by Habtezion and Njuki and Miller where it was found out that women are the drivers to household food security and if they owned the same production resources as men, household food security would be greatly improved^{20,21,31}. If women had enough access and control over a production resource such as land, improvement in household food security is expected to be achieved. Since those who own the land often dictate what to produce, how much and in what season and also control the use of the benefits, lack of ownership of land by women is responsible for their low productivity in dairy production. Therefore, to heighten economic security for women, increase their productivity, improve household food security and improve gender equity, policy makers should also address the issue of women's right to access land^{20,21,31,44}.

Conclusion

Despite the fact that gender discrimination is synonymous with all genders such as men, women, girls and boys, women are the most marginalized of all and yet they contribute greatly to household food security than all other genders. Because of their lack of ownership of the resources of production and lack of powers to make decisions at the household level, women are socially and economically deprived in the household. As a result of this, women's production potential is not fully utilized. The findings from this research reveal that the ratio of women to men participating in all dairy production activities is roughly three to one. This means that more women participate in all the dairy production activities than men which makes them great contributors to milk production than all other genders in the household. Since the greatest percentage of households depends on milk for food either by consuming the milk or by using the money from the sale of milk to buy food, increasing household milk production therefore aids in promoting household food security. Therefore it can be clearly said that women's contribution to household food security outweighs that of men although men possess more powers to make decisions and own more resources of production than women. This literally means that if women had equal opportunities to access and control production resources the same way men do, households would be more food secure than their current state. On addition to accessing and controlling production resources, women if invested with the powers to make decisions on the use of the benefits from dairy production, household food security could be improved. On addition to gender dimensions, household food security was also influenced by several other factors such as; number and breeds of cattle owned. Households owning more numbers of cows and exotic breeds or their crosses were more food secure than those with less and local breeds of cows. This means that increasing dairy productivity has the potential to improve household food security. And lastly, food security also varied according to the size of land owned since most people depended on both crop farming and livestock farming. The

greater the size of land owned, the more food secure households were. Increasing ownership of resources such as land can therefore greatly improve household food security on addition to promoting equality in ownership of these production resources.

Recommendations: The barriers women face while carrying out their roles and responsibilities need to be addressed at various levels. The government should eliminate gender based discriminations by enacting laws, educate women regarding their rights and ensure that women's voices are heard. Collect gender-disaggregated information to enable designing, implementing and monitoring of policies to fight gender inequalities. Design programs that meet the needs of women. There should be stronger emphasis on strategies and policies to ensure female ownership of production resources. Development programs and policy makers should promote women working together in groups so as to overcome their production constraints. The government should as well offer financial support to these groups so as to boost women's access to production resources.

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