



Review Paper

Dairy Cattle and Dairy Industry in Uganda: Trends and Challenges

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Abstract

Agriculture stands as the main sector of Uganda's economy with dairy sector contributing more than 50% of the total output of the country's GDP from agriculture and over 80% of the country total employment. This paper provides review of the status and current advances of the dairy industry in Uganda, identifying the main challenges, giving credit and suggestions for possible improvements.

Keywords: Uganda, dairy cattle, current industry trend.

Introduction

Uganda was considered a pearl of Africa by W. Churchill¹. Uganda is also known as a landlocked country geographically located in East Africa; it's neighbored by Kenya from the east, South Sudan in the north, Democratic Republic of Congo to the west, Tanzania in the south and lastly Rwanda at the southwest². The 2014 National population Census, the total number people was estimated to 34.9 million, a markup increase of 10.7 million from 24.2 million people given by the 2002 Census and its projected that population will be 40.4 million by 2020³.

Agriculture stands as the main sector of Uganda's economy^{4,5}. Over 80% of the active population is involved in small scale agriculture conducting mainly subsistence mixed crop and livestock farming on small land of about three hectare of land on average⁶⁻⁸. Agriculture contributes 31% of the National GDP and the dairy sector is the second to cereal products contributing over 50% to the National GDP of the total output from the livestock subsector⁷.

Milk production in 2011 ranged from 1.6 billion to 1.8 billion litres. However, of the total milk that was produced, 40% was processed into various products under value addition, 45% was sold without being value addition and 15% was disposed as waste⁹. It was estimated that 80% of the milk produced is sold through the informal market channels and about 30% of the marketed milk is consumed at home⁵. In the last decade, the dairy sector has grown steadily at about 8% annually with improvements attributed to the policy and dairy sector reforms, good financial institutions put in place by government and private sector towards promotion of dairy sector among others¹.

The Dairy Industrial Trend in Uganda and Region

Dairy animals and milk regions in Uganda: Small-scale farmers dominate Uganda's dairy production owning over 90% of the cattle population of Country. It was established that out of 96 % of poor citizens who live in rural areas, approximately 60 percent of households keep mainly indigenous cattle^{5,8,10}.

Cattle are the major source of milk, however; goats, camel and buffaloes are among the dairy animals in Uganda¹¹. The estimated cattle herd was 11.4 million as per the 2008 National livestock census and the same report showed that about 1.7 million households owned cattle¹².

The Census also showed growing steady increase of cattle from 4.2 million head in 1986 to 11.4 million cattle in 2008¹³. The cattle population increase is said to be as a result of Cattle restocking, support by government and Non-governmental organizations (NGOs), disease control, training and delivery of advisory services to cattle farmers, increasing market and improved peace and stability in the country are among others^{1,14}. Local breeds contributed over 90% in last livestock census^{12,14}. These local breeds produce low quantities of milk about 2000kg of milk per a lactation year compared to the estimated 8000kg of milk produced per lactation year by cows in developed countries^{15,16}.

The Long horned Ankole and the Nganda are the major local breeds contributing to 30 percent and 70 percent respectively¹⁷, Holstein Friesian and their cross breeds¹⁸. Since the local breeds are still dominating in the dairy sector with the low milk out-put amidst all the efforts above that aimed at improving the dairy industry, this implies that the basic objectives of improving dairy production is not due to only the above efforts per say but could be due to increasing population growth and increased number of dairy farmers.

Dairy Production Systems and Dairy Milk Region (Sheds) in Uganda: There are four major dairy production systems in Uganda^{7,10}, among them include; Free range grazing system, Paddocked system, Communal grazing system and Zero grazing system.

Milk regions in Uganda: There are five major Milk regions (sheds) and based on their differences in terms of; number of cattle, milk production capacities, market conditions, dairy infrastructure and climate^{7,6}. The Western region is leading producer of milk with per farm milk output of about 2,600 litres per year as in 2009/210 and Northern region has the least raw milk productivity per annum as show in figure-1 below¹³.

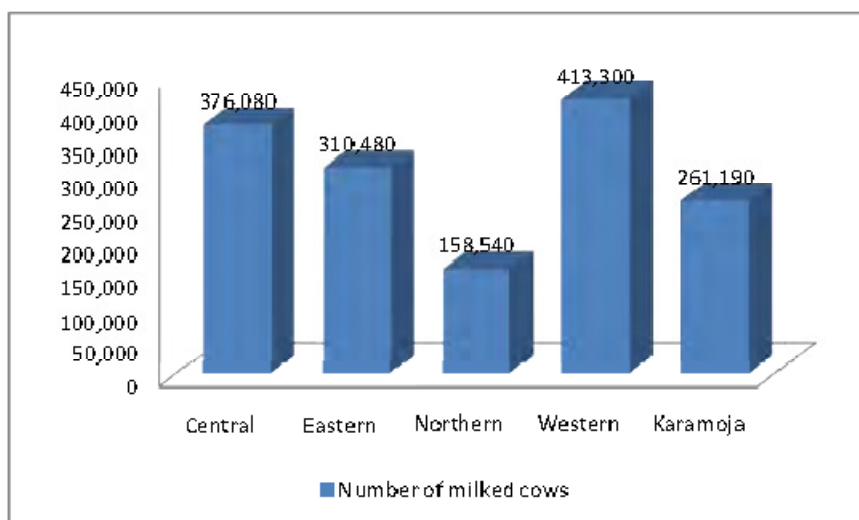
Milk manufacturing and milk products in Uganda: The efforts that were undertaken in early 1990s to make dairy industry freed from the monopoly of the Dairy Corporative created opportunities for private investment and as a result most of the dairy products that were previously being imported from other countries started to be manufactured in the country¹³. Uganda is among the African countries with highest milk production growth rate with a fast annual growth rate of 5.7% higher than the growth rate of Africa as a whole estimated at 2.8% between the periods of 1996-2005¹⁸.

There are about 38 milk processing plants and only 20% of the total milk produced is processed. The daily milk processing capacity by 2013 was estimated to be 1,329, 180 litres per day¹⁶. There exist over 100 more small scale dairy processors with production capacity ranging between 100 and 500 liters of milk per day¹⁹. There is a range of 90 -100 milk collection centres with capacity ranging between 2000 to 50000 litres per cooler in all regions of the country, 70 of which are belong to SALL. There is an estimate of about 50 milk traders, 60 milk delivery tanks operating in all the dairy regions of the country and each tank is having a handling capacity of about 400,000 litres of milk¹³.

Yoghurt, UHT milk, powdered milk, pasteurized whole milk, yoghurt, cheese, butter, ice cream and ghee are major the milk products being processed. The level of milk production in the last two decades is estimated to have more than tripled making Uganda milk secured Country²⁰.

Quality and Regulations in the dairy sector in Uganda: Developments and regulations in the dairy industry are efforts mandated by the Dairy development Authority (DDA) through registering and inspecting all facilities used during handling, processing and marketing milk and milk products. Only operators that meet standards are issued operation licenses By DDA¹.

In liaison with UNBS, DDA enforces dairy standards and regulations that help to ensure quality and safety in the dairy industry¹³. DDA effects regulations in the dairy sector through conducting sensitization and training of all the stakeholders on methods of milk handling, processing, quality control principles, transportation, marketing and International Standards Organization certification protocols. DDA abolished the use of plastic jerrycans and other plastic containers used mostly by the informal channel traders. DDA also abolished open boiling of milk in big saucepans, recommended use aluminum or stainless steel cans and sale bulk pasteurized milk for milk safety¹⁶. DDA encourages small holder farmers who have no pasteurizers to contact dairy processing companies to pasteurize their milk at a fee estimated at US \$ 25/ ton before delivering to the coolers. However, this fee was considered to be high and therefore the system regarded not is user friendly by traders saying that it would make the business unprofitable. DDA however plans to make more negotiations between the traders and processing companies regarding user friendly systems before effecting the ban to selling raw milk^{16,21}.



Source: Data from MAAIF/UBOS 2009

Figure-1
Contribution and distribution of milked cows by Region

Milk Standards: Standards of all products including dairy are set and regulated by Uganda National Bureau of Standards (UNBS). UNBS in conjunction with DDA are responsible to develop, improve, inspect and implement all standards of milk and milk product. These standards are put in place for consumer safety and production quality products that can meet both national and international standards of milk products.

Product standards also cut across up to the East African Community member countries. Member Countries developed regional standards for different products to promote trade with the member states. About 42 different standards were developed and adopted by member countries and among those standards, 3 of them are directly concerned with milk and milk products. For instance, it is mandatory that all dairy import from member countries should bare Animal Health Certificate endorsed by a Competent Authority¹.

Market channels of Milk

There two established market channels of milk in Uganda are; the formal and informal channels are described as the two main milk and dairy product marketing channels of the country. The informal channel dominates the milk sector. It is also known as traditional ways of milk marketing with milk purchased from farmers and are later sold to consumers with limited processing (value addition). Chilling and transportation is the only value addition done under the informal channel. The informal channel has direct on-farm selling of milk to consumer by farmers or by use of milk middlemen with milk handling capacity of about 300 litres per day. The formal channel is regarded as the large scale milk processors and wholesalers of chilled milk with a capacity of up to 30,000 litres per day.

There are about 800-1000 small scale mobile milk traders in urban areas of Kampala, Entebbe, Mukono and Jinja who buy milk directly from farmers and sale to consumer by use of

bicycles or motorcycles¹. Informal market channel dominates dairy sector. In mid-2009, over 85% of the milk produced in Uganda was sold via the informal market channel unprocessed milk sales valued at US\$ 160 million¹⁹.

Milk Marketing Trends in Uganda (Imports and Exports)

Domestic milk market demand: Over 98% of the milk produced is sold in the domestic market¹³. Milk consumption in early 2000s was low estimated at 28 liters per capita annually². However due to the estimated steady growth of milk production at a rate of over 8 percent per year, the annual consumption of milk per person is estimated to be 58 lit per person per year. However, that annual milk consumption per person is still low as WHO recommends 200 litres/person/annum¹⁷. Milk consumption is ranked fifth among the beverages consumed in Uganda. Low milk prices are one of the factors contributing to low milk production hence affecting annual milk consumption because over 50% of the milk produced during the milking rainy seasons is left at the farm without being sold due to low prices²². The per capital consumption is higher in urban area (Kampala) with 91 litres /person/ year and lowest in the rural areas about 22 litres/person/year⁶.

Milk and dairy products consumption rate in Uganda: It is estimated that of 70% of the population consumes milk once in a week, 36% can afford milk daily, over 80% of the population did not consume butter at all or irregularly consumed it and an estimate of 7% of the population were regular consumers of butter. Cheese was the least consumed dairy product about 4% of population. However milk and dairy products consumption rate depends on the region of the country with central region highest consumer with about 63%, western and eastern region at 54%¹. Yoghurt is consumed highest followed by ice cream, butter and ghee as shown in figure-2.

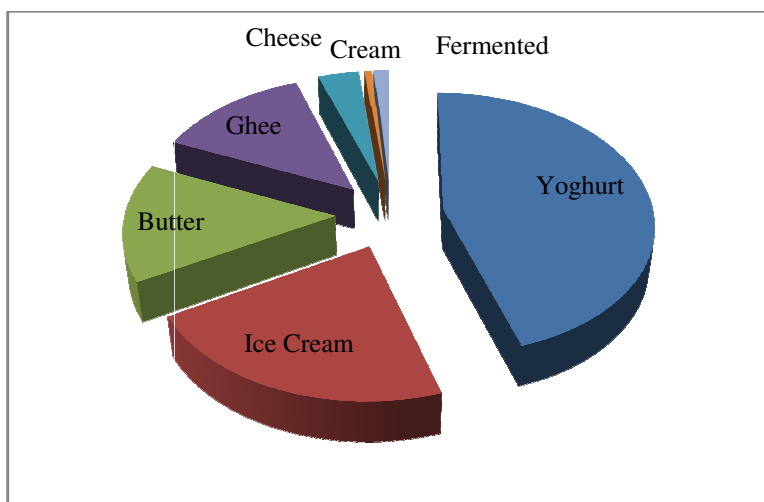


Figure-2
Most consumed dairy products in Uganda

Yoghurt consumed highest because its demand is throughout all social classes of people and there are many yoghurt processors, many of which are not registered or regulated by Dairy Development Authority¹.

Export potential

In 2011, Dairy exports were estimated to be 12 million litres of UHT, an equivalent of only 10% of all processed milk. Informal export trade continues to operate across all borders of Uganda¹⁷. The value of milk and dairy exports in 2013 was expected to be \$12.1m, a steady rise from \$11.5m in 2012, and \$3.4m in 2011¹⁶. Kenya, Democratic Republic of Congo, Rwanda, Southern Sudan, and Tanzania are considered the major dairy export markets of Uganda¹³.

Challenges Affecting the Dairy Sector

Animal breed and disease: Dairy sector is dominated by local cattle breeds such as the Ankole longhorn 50%, zebu 30% Nganda 16%. The local breed milk yield estimate to be low about 500-1500kg per lactation year far below 8000kg of milk yield per cow in developed countries. Diseases particularly of tick-borne and trypanosomiasis and their high cost of management are among the factors hindering adoption of improved breeds because they are more susceptible compared to local breeds. Tick-borne disease management is estimated to be 85.6% among the pastoralists and 73.8% to the ranch farmers, routine vaccination rare and vaccination during diseases outbreaks are delayed all the above setback milk production⁷.

Poor Milk Quality: The quality of milk is poor because farmers are paid for their milk in terms of volume rather than milk valuable components or quality. Milk tests such as bad odor, water adulteration, antibiotics contaminations before buying is rare. Milk rejection due to water adulteration also seems rare since farmers have developed techniques of adding water without having their milk rejected. Despite initiatives to improve milk handling by DDA, use plastic jerry cans, open air boiling of milk to kill pathogens, addition of water and chemicals to the milk during the boiling process still takes place.

The collection of milk from many different farmers and different collection points for later delivery to bulk tanks leads to multiple risks of contamination with difficulties to trace contamination source point. DDA has put legal regulation against milk adulteration from any trader and if such actions are implemented the quality of milk in Uganda will improve².

Low milk production: The dairy sector is dominated by informal market channels about 80%. It is characterized with reduced farm investment in improved dairy cattle breeds, low technology milk handling and processing equipment such as inadequate modern pasteurizers and lack of on-farm cooling equipment². Reduced milk transportation facilities, poor

infrastructures such as roads and long distances to milk markets, shortage or lack of electricity network especially in the Northern and Eastern milk sheds. It's worth noting that the limited access of credit services from financial institutions to help traders buy modern milk handling facilities for improved milk production are among the constraints in the dairy sector^{1,2,13}.

Market challenges: Low milk prices and other animal outputs from the farms are among the major constraint in the dairy sector. The low prices are said to have started since 2004 as was documented in 2008. Milk prices drop as low as Uganda Shs. 300 -350 per litre and the prices depend on the buyers in places like Mbarara and Bushenyi. This low price discourages the farmers and traders increase milk productivity since the inputs are very expensive and therefore left with option to buy and use small and affordable equipment. The continuous persistence by some smallholder farmers resist to sale milk to the formal market and opt selling to the informal market has promoted to low milk prices since the informal market channel is hard to regulate hence led to deliberate low price and also limitation of the commercialization of the dairy industry.

The strict product export standards especially in the European Markets are difficult to implement hence a major a big challenge for Ugandan dairy exporters to maintain in order to secure European markets. UNBS and DDA as the regulatory body for quality should be able to adopt and implement the international export standards if Uganda is to benefit from export markets. The unpredictable foreign price changes amidst the quality standards are a big challenge in the dairy export. There is need to improve product quality, packaging and Market knowledge and marketing skills to increase export potential^{6,1}.

Losses of Milk and Dairy Products: There are pronounced losses of milk from various stages of production and handling. The losses produced milk was estimated to be 25% o, 19% losses in marketable milk and 5.8% of the milk said to have been lost at the farm and other production stages. General economic value of the marketable milk loss per year was approximated at U.S. \$23 million².

Conclusion

Dairy sector is second contributor of the GDP to the country's economy. The sector contributes the largest portion of employment hence a major household source of food and daily income. The dairy production in Uganda is dominated informal market channel and it's also based largely on traditional small-scale milk production systems. Due to the improved developments and increased growth rate, Uganda is considered among the major African dairy producing countries.

However the dairy sector has a number of challenges hindering positive development and which include: low milk productivity due to poor local breeds of dairy cattle, over dependence on family labour, poor milk quality, low use and adaptation to

modern technology for production, excess milk and dairy product losses, limited financial support, low milk prices and limited market, dominance of the dairy sector by an regulated informal market traders are among the constrains of the sector.

Recommendations: In order to overcome the above challenges, I suggest that government, NGO's and other stakeholders to provide financial support, mobilizing farmers and dairy traders to adopt improved milk handling facilities, for more organized dairy farmers groups. There is need to promote small scale rural community and single based dairy processing plants through training them on good manufacturing practices (GMP), adopting use of improved cattle breeds, timely disease control and management, this will help to improve production, product quality and minimize spoilage and pathogenic out breaks in the dairy products. The sector should address market access challenges both local and export markets by improving and adopting international food standard and improving market information systems and advertisements.

There is need to improve sensitization and information access to all stake holders in the dairy sector especially to the majority that live in the far rural areas through user friendly and convenient methods like village posters in trading centers, local radio talks show, improve on rural feeder road-network and community based updated data collection systems regarding number of dairy animals, milk production.

References

1. Balikowa D., Dairy Development in Uganda: A Review of Uganda's Dairy Industry, National Consultant, GOU/FAO Dairy Project, TCP/UGA/3202 (D) (2011)
2. Combs D.K and Dobson W.D., Prospects for Uganda's Dairy Industry, The Babcock Institute for International Dairy Research and Development University of Wisconsin-Madison, College of Agricultural and Life Sciences, N. 2005-4 (2005)
3. UBOS, National Population and Housing Census Uganda Bureau of Statistics (UBOS) and Ministry of Agriculture, Animal Industry and Fisheries, (2014)
4. IMF, Uganda Poverty Reduction Strategy Paper. International Monetary Fund Washington, D.C, (No. 10/141) (2010)
5. Grimaud P., Sserunjogi M, and Grillet N., An Evaluation of Milk Quality in Uganda: Value Chain Assessment and Recommendations, (2007)
6. Wozemba D. and Nsanja R., Dairy Investment Opportunities in Uganda-Report, SNV: Netherlands Development Organisation, (2008)
7. Ekou J., Dairy production and marketing in Uganda: Current status, constraints and way forward, *African Journal of Agricultural Research*, 9(10) 881-888 (2014)
8. King A., Case study: Livestock, hides, skins and leather products, European Commission, (2002)
9. Ssemukasa E. and Kearney J., Health and food safety concerns of early dietary introduction of unmodified cow milk to infants in developing countries, *African Journal of Food, Agriculture, Nutrition and Development*, 14(1) 8504-8517 (2014)
10. Staal S. and Kaguongo W., The Ugandan Dairy Sub-Sector: Targeting Development Opportunities, Report prepared for IFPRI and USAID-Uganda, International Livestock Research Institute (ILRI), Future Harvest, Nairobi, Kenya, (2003)
11. Balikowa D., Dairy development in Uganda: A review of Uganda's dairy industry, Dairy Development Authority (DDA), Uganda, (2011)
12. UBOS., The National Livestock Census Report, Uganda Bureau of Statistics (UBOS) and Ministry of Agriculture, Animal Industry and Fisheries, (2008)
13. Mbowe S., Shinyekwa I. and Lwanga M.M., Dairy sector reform and transformation in Uganda since the 1990s. EPRC, Uganda, (2012)
14. FAO., FAO/GIEWS Livestock and Market Assessment Mission to Karamoja Region, Uganda, Food and Agriculture Organization of The United Nations, Rome, Special Report (I3674E/1/03.14) (2014)
15. Atuhaire A. M., Mugerwa. S., Kabirizi J. M., Okello S. and Kabi F., Production Characteristics of Smallholder Dairy Farming in the Lake Victoria Agro-ecological Zone, *Uganda Frontiers in Science*, 4(1), 12-19 (2014)
16. Masinde A., Agribusiness: Only 20% of Uganda's milk is processed, *New Vision Uganda*, (2013)
17. Netherlands., Identification of livestock investment opportunities in Uganda, *Agriterra*, 12-5813 (2012)
18. Ndambi O.A., Perspectives for dairy farming systems in Africa, Christian-Albrechts-Universität, Diss, (2008)
19. UIA., Investment Opportunities in Uganda's Dairy Sector, Uganda Investment Authority (UIA), (2010)
20. Mwebaze T. and Kjaer A.M., Growth and performance of the Ugandan dairy sector: elites, conflict, and bargaining, *International Journal of Agriculture Innovations and Research*, 2(3), 287-298 (2013)
21. Kabunga N., Improved dairy cows in Uganda: Pathways to Poverty Alleviation and Improved Child Nutrition (2014)
22. Kasiryre F.N.M., Milk and Dairy Products, Post-harvest Losses and Food Safety in Sub-Saharan Africa and the Near East, FAO Prevention of Food Losses Programme, June, (2003)