



Improved Smallholder Dairy Farming in Uganda through Technological Change

Swaibu Mbowa, Isaac Shinyekwa and Musa Mayanja Lwanga

Executive Statement

The dairy sector in Uganda has been transformed into a more competitive and dynamic sector. Supply-side factors have enabled expansion in milk production. Between 2005 and 2009 –milk production (estimated at 1.5 billion litres in 2010) has been partly an outcome of a 20 percent increase in the number of households engaged in dairy farming, and an increase (21 percent) in the proportion of crossbred dairy cows in the national herd (estimated to be 11 million cattle). At farm level concerted efforts have been directed towards technological change – transforming the farming system from predominantly extensive grazing local breeds to more intensive rearing of fewer but improved breeds. The lack of consistent long-term support to the breeding programs negatively affect numbers of dairy cattle stocks especially in Northern Uganda. Furthermore, the perpetually low farm gate milk prices could deter the optimal uptake of required dairy farm husbandry practices in the milk surplus Western region.

Introduction:

This policy brief highlights elements of success in the dairy sector where predominantly small scale farmers have responded to market incentives by adopting high grade (exotic/cross) dairy cattle to increase milk production to satisfy the growing demand for dairy products in the country. The brief is an excerpt from the main report by Mbowa *at al.* (2012)¹. Attempts are made using national representative Uganda national panel survey (UNPS) data collected by the Uganda Bureau of Statistics (UBoS) to provide accurate regional estimates in the distribution of households engaged in dairy farming – dairy cattle numbers by breed – and total milk output across regions in the country. The objective is to arm policy makers, the Dairy Development Authority (DDA), milk processing agribusinesses, inputs agents, and development partners with information vital for future planning and development of the dairy sector in Uganda. This information is also critical for developing pathways to boost farm level productivity, expand employment, reduce malnutrition and fight poverty via the agricultural sector.

Dairy farming - A Growing Household Enterprise

The dairy sector is gaining importance as a source of income for an increasing number of households across all regions in the country, with the majority located in the Eastern

region, Central, Western and Northern regions, respectively. Overall the number of households engaged in dairy farming increased by 20 percent (from 582,000 to about 700,000) between 2005 and 2009 (Table 1). The dairy sector is a typical example of a success story of how employment can be created by having the right market incentives and innovative agricultural technological interventions at the time when the country is grappling with youth unemployment in the agricultural sector.

Table 1: Regional Increase in Number of Households ('000) in the Dairy Sector

| Region | 2005/06 | | 2009/10 | |
|----------|----------|------------|----------|------------|
| | Dairying | Percentage | Dairying | Percentage |
| | HH | % | HH | % |
| Central | 157,273 | 15.5 | 163,680 | 14.3 |
| Eastern | 192,814 | 17.5 | 227,036 | 20.7 |
| Northern | 85,961 | 9.9 | 121,941 | 13.1 |
| Western | 146,294 | 12.5 | 186,417 | 14.9 |
| Uganda | 582,342 | 14.0 | 699,074 | 15.8 |

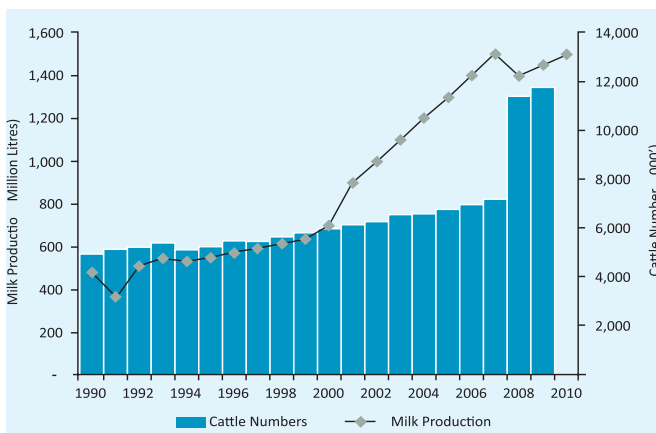
Source: Calculations based on the 2005/06 UNHS, & 2009/10 UNPS

Technological Change in Milk Production

There has been an incredibly good response in the adoption of high grade cattle and replacement of indigenous (local)

breeds to increase milk production country wide (Table 2). Between 2005-2009, milk production increase is partly explained by a 20 percent increase in the number of households engaged in dairy farming (Table 1), and an increase in the proportion of crossbred dairy cows in the national herd (Table 2). As the proportion of grade animals improved, the growth in cattle population as well increased from about 5 million in 1990 to 11 million heads in 2010. This growth is thus both qualitative and quantitative in nature. There is evidence that the trends in milk production have a strong relationship with the growth in cattle population and change in breed composition. (Figure 1).

Figure 1: Trends in Milk Production and Cattle Numbers from 1990



Source: Twinamasike (2001); DDA (2006); EPRC (2009); and UBOS (Statistical Abstract 1990-2010)

The overall stocking rates of grade cattle in relation to indigenous dairy cattle increased from 14 percent in 2005 to 21 percent in 2009 (Table 1). Historically the Western region has been the milk hub of Uganda,²³ with the highest number of dairy cattle (both improved and local), and contributing the bulk of milk produced and sold (marketable surplus), but in the recent past sizeable gains in stocking dairy cattle breeds and commensurate milk output are recorded in the Central and Eastern regions by 2009 (Table 2 and Table 3). The Central region provides the biggest market for milk. The spreading of dairy activities to other regions of the country is – a new development in the dairy industry. There is noticeable transformation of livestock husbandry management practices from local to cross breeds (see picture 1) – and reduced herd sizes to improve productivity per cow¹. In the Eastern and Northern regions the system ranges from zero and restricted grazing to extensive grazing of local zebu cattle for milk production (see picture 2).

1 A local cow yields 2-3 liters per day compared to 10-15 liters per day from cross breeds.

Table 2: Dairy Cattle Numbers ('000) by Breed and Region between 2005 and 2009

| | 2005/06 | | | | 2009/10 | | | |
|----------|--------------|-------|------------|-------|--------------|-------|------------|-------|
| | Exotic/Cross | | Indigenous | | Exotic/Cross | | Indigenous | |
| | Numbers | % | Numbers | % | Numbers | % | Numbers | % |
| Central | 115 | 10.0 | 2,342 | 32.6 | 408 | 24.3 | 3,150 | 48.5 |
| Eastern | 82 | 7.2 | 1,412 | 20.6 | 252 | 15.0 | 1,180 | 18.2 |
| Northern | 48 | 4.2 | 1,428 | 20.8 | 3 | 0.2 | 955 | 14.7 |
| Western | 900 | 78.6 | 1,684 | 24.5 | 1,019 | 60.5 | 1,215 | 18.7 |
| Uganda | 1,145 | 100.0 | 6,866 | 100.0 | 1,682 | 100.0 | 6,500 | 100.0 |

Source: Authors' calculations based on the UNPS 2005/06 and 2009/10.

Table 3: Regional Distribution of Raw Milk Output and Surpluses

| Regions | 2005/06 | | 2009/10 | | |
|----------|----------------|-------|----------------|-------|--------------------------|
| | Output | Sales | Output | Sales | Consumption ¹ |
| | Million Litres | | Million Litres | | |
| Central | 244 | 85 | 302 | 139 | 430 |
| Eastern | 100 | 41 | 159 | 62 | 82 |
| Northern | 84 | 17 | 69 | 32 | 34 |
| Western | 273 | 152 | 480 | 292 | 128 |
| Uganda | 701 | 295 | 1,009 | 524 | 673 |

Source: Authors' calculations based on UNPS 2005/6 and 2009/10

Challenges and Constraints

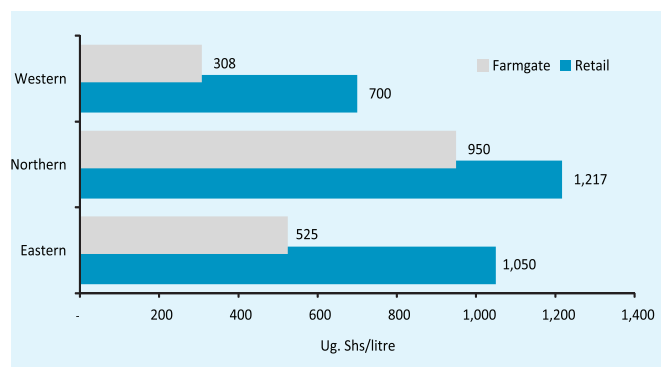
The NGOs (Send A Cow, Land O'Lakes and Heifer International) played an important role in developing the Ugandan dairy sector through restocking grade dairy cattle and breed improvement programs - facts well documented by FAO (2011). However, sporadic and short-term nature of technical interventions from NGOs and the government restocking program of Northern Uganda - without long-term breeding programs is negatively affecting dairy cattle stock build up in this part of Uganda (Table 2). The communal land tenure system – encourages communal grazing that discourages farmers to invest in farm physical infrastructure vital in dairy farming. This also constrains adoption of improved breeds in the Northern and partly the Eastern region (especially in greater Soroti). The few farmers that have taken up exotic/crosses dairy cattle use zero grazing which is labour intensive and restricts stock numbers.

The perpetually low farm gate milk prices negatively impact the capacity to invest in innovative milk production technologies, especially in the milk surplus Western region (Figure 2).

Implications and Recommendations

There is a growing number of households engaged in dairy farming in Uganda, but the uptake of grade animals and the known accompanying benefits - poverty reduction,

Figure 2: Average Farm gate and Retail Raw Milk Prices (Ug. Shs/litre) by October 2011-February 2012



combating of malnutrition and employment vary across regions - therefore further interventions - education and sensitization programmes on dairying and milk production should be developed to target the farmers and to promote dairying as an enterprise in small scale dominated Ugandan agriculture. The World Bank (2008) uses the Indian case study to demonstrate that improving the dairy sectors in Uganda and Tanzania could contribute substantially to reducing child and maternal mortality – part of the Millennium Goals – while increasing income and employment for small rural households. Milk shortages accompanied by high retail prices are detrimental to household milk up take especially in the Northern region - public investment in infrastructure development like roads and electricity is necessary in support of integration of the raw milk market between regions to even out the price differential country wide.

More technical support from dairy specialising NGOs like; Land O'Lakes, Heifer International and Send a Cow that provided the technical support to set off the dairy industry are still required to be rolled out country wide. This needs to be integrated with the public veterinary extension services in the various regions for sustainability. As more households enter the dairy business, knowledge gaps are apparent on the relatively new technologies encountered. Likewise the husbandry livestock farming systems are evolving from extensive with local breeds to semi-intensive - improved cross breeds systems in response to the reforms. These are pointers to new challenges that need to be addressed by the government to deliver a more vibrant dairy sector.



Picture No1: Changing Dairy Farming System from extensive grazing of Local Breeds to intensive rearing of fewer improved breeds in south Western Uganda



Picture No2: The dairy farming system ranges from zero and restricted grazing to extensive grazing of local Zebu in Eastern and Northern Uganda

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Conclusions

Intensification in adoption of better technologies leads to increased output. Farmers respond positively in the uptake of agricultural technologies that result in increased income. The absence of supportive systems might deter the adoption of appropriate technologies. This could lead to reversal of productivity gains after a right intervention. This was the case in Northern region (in particular Nebbi district) where milk prices are high, but failure to address sustainability and follow up activities of AI services curtailed the Women group - beneficiaries of the zero grazing project that was initiated by Send A Cow to expand milk production.

Footnotes

1 Milk consumption figures milk might include figures of other milks (goat milk and imported UHT processed milk)

Endnotes

- 1 Economic Policy Research Centre, Dairy Sector Reforms and Transformation Report (Kampala, 2012)
- 2 DDA (2008). Overview of the Status and Performance of Uganda's Dairy Industry: Dairy development Authority. February 2008, Kampala.
- 3 World Bank (2009). South South Exchange – Sharing of Knowledge and Innovations, The case of the Dairy Sector in India, Uganda and Tanzania. The World Bank.

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