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Dairy value chains in East Africa

In brief

- Global trade in dairy products doubled in the period 2010-13. However, traded milk still represented only 10% of global milk production in the same period, whilst in East Africa, just 1% of production is traded beyond the region.
- A near eleven-fold increase in intra-regional dairy trade between 2002-05 and 2010-15 is reassuring, and this astonishing growth is partly attributed to capacity upgrading in the region's trade institutions.
- This study addresses both Uganda and Rwanda's capacity to produce dairy products and how they might improve this capacity in order to grow exports.
- The investigators suggest a series of policy recommendations, including joint investment in improving capabilities, improving relationships between processing plants and farmers, improving product quality through training and licensing milk collectors, enhancing collaboration between public and private stakeholders, and prioritising the facilitation of regional trade and exports from the region.

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Background

Global trade in dairy products doubled in the period 2010-13. However, traded milk still represented only 10 percent of global milk production in the same period (FAOSTAT, 2015). Dairy exports are mostly limited to processed, dried and/or preserved products: cheese (27%), whole milk powder (WMP) (21%), skimmed milk powder (SMP) (16%), butter (5%), and whey (6%), ranked top in terms of export values (UNComtrade, 2015).

In East Africa, just 1% of production is traded beyond the region. However, a nearly eleven-fold increase in intra-regional dairy trade between 2002-05 and 2010-15 is reassuring. This astonishing growth is partly attributed to capacity upgrading in the region's trade institutions, particularly the Single Customs Territory, 60% Common External Tariff on dairy products originating outside the region, and the harmonisation of regional standards for dairy products (Bingi & Tondel, 2015). Private stakeholders in both Rwanda and Uganda have also made numerous investments in rehabilitating and/or establishing national cattle stocks, milk collection infrastructure, and processing plants. Despite these numerous innovations and investments, the region's dairy sector still suffers enormous organisational and relational constraints, relative to leading international exporters.

Capabilities of leading global dairy exporters lacking in EAC value chains

Leading international dairy exporters in New Zealand, the European Union (EU), and the United States (US) benefit from largescale production and hence scale economies, highly specialised dairy processing firms, and strong distribution networks. In East Africa, although the leading dairy firms have adequate firm-level financial resources, and often have large capacity in their processing plants and packaging capabilities, they often struggle with capacity utilisation: the insufficient supply of quality milk implies that most dairy processors operate below capacity, leading to high cost-per-litre processing costs. Formal East African firms also struggle to reach consumers: loosely connected networks of retailers, wholesalers, and transporters control about 80% of the dairy market, often buying milk from farmers and selling directly to customers with little or no preservation or quality control measures (Zijpp, 2014).

Locating Uganda and Rwanda in the regional dairy value chain

Milk production

Milk production in Uganda increased tremendously over the past two decades, from 160,000 litres per day in 1993 (when liberalisation began), to over 1.4 million litres in 2014 (Makoni et al., 2014). Production since 2000

has grown at an annual rate of 7%, mostly attributed to expanding the national cattle stock, particularly the post-conflict restocking programmes (Mbowa et al., 2012). Smallholder dairy farms averaging 6.9 cattle manage 90% of the national cattle stock (Balikowa et al., 2011), so it is no surprise that farm-level milk productivity is estimated at just 500kg per year (Ndambi & Hemme, 2009).

Three production systems exist in Uganda. First, the traditional open grazing and feeding system – with the lowest milk productivity – accounts for 85% of the national cattle stock (Makoni et al., 2014). The second system involves mixed crop and livestock farms; small-scale firms of approximately ten cattle that graze the cattle during rainy seasons and resort to complementary feeding in the dry season. This mixed system developed following liberalisation, and is mostly practiced in peri-urban areas. Lastly, the zero-grazing system is used by large dairy farms of 20 to 100 exotic cattle, mainly in Western Uganda; this accounts for 6% of the total cattle population (Balikowa, 2011). The cost per kg of milk produced is three times higher under zero grazing relative to open grazing, but this is compensated by a four-fold higher production per cow (Mbowa et al., 2012). Supply differs between rainy and dry seasons, and profit margins are influenced by the prices of feed (costs) and milk (revenue), which are both highly volatile.

In Rwanda, the open grazing system is most common in the remote Northern and Northwestern regions, which are challenged by reliable access to markets. In partial remedy, IAAKIB cooperative and Blessed Dairy Ltd have connected milk supply from this region with the demand in Kigali and the neighboring Democratic Republic of Congo (DRC). Unlike Uganda, the (second) system of mixed farming is the most common dairy system in Rwanda. Practiced mainly in the Eastern province, the system takes advantage of larger landholdings but is generally challenged by poor access to clean water, land degradation, and protracted droughts. The final method, zero-grazing, is also more common in Rwanda than it is in Uganda, owing to both the high population density and policy emphasis. The system is more common in peri-urban areas of Kigali and in the South and Western provinces, where high production costs are compensated by good access to urban markets in Kigali.

The Government of Rwanda (GoR) and development partners have focused on increasing the cattle stock through various initiatives, most popularly the “one cow per poor family” or “Girinka” programme launched in 2006, as well as massive investments in milk collection centres (MCC). As such, Rwanda’s milk production increased more than tenfold from 2000 to 2014, from 58,000 tons to approximately 700,000 tons; although starting from a small base, this rate is much faster than growth experienced in Uganda, where production expanded only by more than twofold, from 595,000 tons in 2000 to 1.3 million tons in 2014 (CountrySTAT, 2015). Small landholding size of 0.7 hectares per household however restricted cattle stock expansion.

Milk collection and trade

Massive investments and structural changes have taken place in milk collection and trade in both countries. In Uganda, the transition from the state-owned Dairy Corporation Limited (DCL) to private dairy firms has given room for numerous innovations. Nonetheless, informal milk suppliers account for 80-85% of milk markets, while largescale dairy processors suffer under-supply. Although the government and development partners have made massive investments in milk collection centres (MCCs), there is a wide regional variation; 75% of MCCs are in the Southwestern region and 15% in the Central region, for example, while the remaining regions only share 10%.

Three organisational structures characterise milk collection and trade:

1. Direct delivery to consumers without treatment. This constitutes 20-30% of total milk sales and has the least potential for value addition.
2. Milk is bulked and cooled at MCCs, which then bypasses processors and is distributed directly to consumers. This constitutes 50-60% of total milk marketed (Makoni et al., 2014).
3. Milk goes through dairy processors that own and/or operate processing plants and can produce pasteurised packaged dairy products. 15-20% of total marketed milk is processed through this channel.

Informality in Rwanda is also a major issue restricting the use of MCCs. Independent transporters and local traders manage 85-90% of milk sales (Makoni et al., 2014); these predominantly buy raw, unprocessed milk and distribute it directly to customers. GoR and development partners have invested substantially in MCCs. By 2016, the country had a total of 96 MCCs, with a 50% increase over the 2012 collection capacity (Land O'Lakes Inc., 2012). Unlike in Uganda, where MCCs are predominantly owned by one large operator (SALL), local cooperatives in Rwanda play a big managerial role, including milk bulking and marketing, as well as provision of farmer training, credit, and veterinary services and inputs to cooperative members.

However, while MCCs demand higher quality milk, farmers in Rwanda are not paid extra for the higher milk quality, which often incentivises dairy farmers to sell milk to the informal market. As a result, MCCs and other players in the formal dairy industry remains under-supplied, and its share in total marketed milk is as low as 20-30%, compared to the 50-60% of milk passing through MCCs in Uganda (Makoni et al., 2014). Break-even milk quantities are around 2,000 to 2,500 litres per day for the average MCC, and by not reaching this, many have suspended operations. Milk adulteration and transportation under unhygienic conditions characterise the informal market (USAID, 2015), despite farmer training by the GoR, the East Africa Dairy Development Program (EADDP), Rwanda Dairy Competitiveness Program II (RDCP II), and Netherlands Development Organisation (SNV), as well as a ban on milk transportation in plastic jerry cans.

Milk processing and distribution

Although Uganda's milk processing capacity has increased four-fold over the past decade, most dairy processors operate below installed capacity, with the exception of JESA Farm whose business model replies on trust-based relation with milk suppliers. Industry-level capacity utilisation oscillates between 40-60% between the lean and peak production seasons, implying an upward push on the per-litre processing cost especially in the dry season. Despite the end of state-controlled processing, the dairy industry is still highly concentrated; the top three processors control 83% of the national installed capacity, and there are just 14 processors for the whole country.

There are currently three distribution systems for processed dairy products:

1. Distribution systems owned and operated by the dairy processor, using trucks to distribute products to distribution outlets,
2. Distribution systems owned by the dairy company but outsourced to independent entrepreneurs; and
3. Grocery retailers and modern supermarkets.

Supermarket retailers consider dairy a key product line and market a range of dairy products manufactured by local and regional dairy processors: pasteurised milk, UHT milk, powdered milk, yogurt, and cheese. Despite the challenges in Uganda's dairy industry, the country has been identified as one of the 20 'Markets of the Future' that will offer the most opportunities for consumer goods companies (Euromonitor, 2015). The modern retail outlets are expected to increase their sale of dairy processed products at 11% compound annual growth rate (CAGR) during 2013-18.

Similar to Uganda's case, the increase in dairy processing in Rwanda has not been matched with quality and capacity utilisation. Less than 10-15% of the milk sold in Rwanda is processed, although an estimated 30% is channeled through MCCs (Land O'Lakes Inc, 2012; Makoni et al., 2014). Informal distribution channels account for 80% of total milk sold. Formal processors suffer capacity underutilisation, costly packaging, and limited reach of retail distribution networks.
There are six dairy processors in Rwanda. Inyange Industries Limited accounts for 60% of total processed milk and mainly produces pasteurised whole and skimmed milk, fermented milk, UHT milk, fresh cream, and yogurt. Yogurt constitutes 90% and 50% of the sales of two smaller players, Masaka Farms and Blessed Dairy, respectively.

The fluid milk segment faces tough competition from informal players who operate at lower cost and hence offer substantially lower prices. There is currently low capacity to convert milk into longer-lasting dried milk.

In an attempt to address the low capacity utilisation of processing plants (20% at the industry level), Inyange Industries in 2012 invested in backward integration, expanded its own cooling and storage infrastructure, and

entered into a milk supply contract for a minimum of 35,000 litres a day with Nyagatare Farmer Union located in the Eastern Region (Makoni et al., 2014).

Besides the inefficiency of milk collection and processing, the sector suffers high packaging costs, which range between 15-20% of the total cost for small firms that do not produce their own packaging materials.

Pasteurised milk is marketed in Kigali at $1.00 to $1.20 per litre compared to $0.45 per litre of boiled milk – a price difference of 160% that helps explain the low market shares of formal processors. Pasteurised milk, UHT, and yogurt are normally distributed through supermarkets, while cheese and fresh cream are mainly sold through hotels and restaurants (Abreu, 2015; Blessed Dairy, 2015). Dairy processors have attempted innovation in marketing and distribution. For example, since 2015, Blessed Dairy has entered into a contract to supply RwandAir 600 yogurt cups per week (Nsekanabo, 2015). Similarly, Inyange Industries introduced a strategy of selling pasteurised, unpackaged milk at 70 "milk zones", at half the price, increasing milk sales by 17,000 litres per day within 18 months of launch of the strategy (Makoni et al., 2014). This improved its competitiveness against the 1,500 informal kiosks selling raw or boiled milk directly to consumers around Kigali. While Rwanda Bureau of Standards conducts regular quality checks and trainings in the formal market, competition with informal, unregulated players forces formal players to keep prices down, at the cost of product quality.

Recommendations to improve dairy chains in Rwanda and Uganda

Upgrading the dairy chain in Rwanda and Uganda is contingent upon resolving a series of capacity constraints. The following policy recommendations are targeted at addressing these constraints at upgrading dairy industry in both countries.

- Pursue joint regional investment promotion strategies to expand regional capabilities in manufacturing of exportable dairy products.
- Improve relationships between processing plants and farmers, to encourage more farmers to sell to plants.
- Train and license milk collectors to improve quality of milk supplied to processors.
- Improve collaboration between public and private stakeholders, and relationships between these and the international development programmes.
- Prioritise facilitating regional trade and exports from the region, given the binding constraint of weak domestic ability to pay for higher-value products.