The potential of dairy production in sub-Saharan Africa

[1,2] J. K. NYAMEASEM, [1]T. REINSCH, [1]C. MALISCH UND [1]F. TAUBE

[1]University of Kiel, Institute of Crop Science and Plant Breeding – Grass and Forage Science / Organic Agriculture, Kiel, Germany, [2]Council for Scientific and Industrial Research—Animal Research Institute, Ghana

jnyameasem@gmail.com/jnyameasem@gfo.uni-kiel.de

Introduction

There is a rapid increase in aggregate consumption of milk globally because of rising income levels and this is causing people to diversify from starch-based diets to diets containing growing amounts of dairy and meat (Muehlhoff et al., 2013). The demand for milk and meat is projected to double over the next two decades in Africa also because of the faster rate of population growth, particularly in the East and West (Fig. 1).

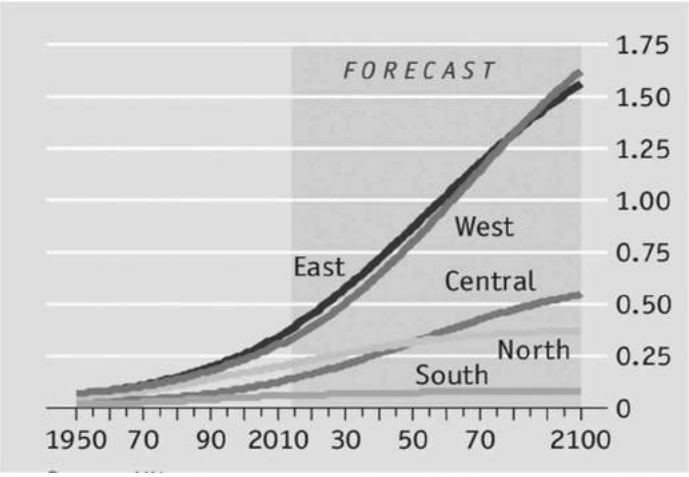

Fig. 1: Population trend of Africa (billion). Source: United Nations

The ability of agriculture to meet this growing demand for animal food products hinges on sustainable agricultural practices which must ensure food security, combat climate change and stimulate development of new markets. Due to its vast available resources, Africa has the potential for economic development and to supply food resources to the rest of the world. However, consistent and committed actions are required by stakeholders towards improving the investment climate, close the huge infrastructure gap, focus more on innovation as the primary driver of productivity, growth and competitiveness and develop institutional and human capital (Ndulu et al., 2007).

Milk consumption per capita in Africa is the lowest in the world because of limited access and affordability (Hill, 2017). Although dairy products are traditionally not a major part of many African diets, consumption has increased over the years. However, the continuous dependence on imported milk has discouraged local milk production and has led to increased cost of milk, putting milk consumption beyond the reach of the average African (Adewumi and Olorunnisomo, 2008). This paper discusses the importance, status and ways to improve the dairy sector of sub-Saharan Africa.

The potential impact of dairy production in sub-Saharan Africa (SSA)

Increased availability and consumption of milk in Africa could accelerate the achievement of the sustainable development goals 1 (no poverty) and goal 3 (good health and well-being for people). Stunting, which reflects the cumulative effects of poor maternal nutrition, poor diet and infections during the first two years of life, is prevalent in Africa (Muehlhoff et al.,

2013). Animal milk could therefore be used as a supplement to breast milk and as an additional protein source to children, hence reducing child malnutrition, especially in children less than 5 years old. Dairy consumption can translate into substantive reduction in national healthcare costs. Dairy intake ensures significant supply of a variety of macro and micro nutrients which improves metabolic health and muscular-skeletal health, and reduces dental caries, incidence of cardio-vascular diseases, hypertension and type-2 diabetes (Hill, 2017). Increased availability and consumption of milk could therefore have a positive impact on the health of both infants and adults on the continent.

More than 80 percent of the milk produced in SSA comes from small-scale dairy producers. When well developed, dairy farming could improve food security and provide employment and income to millions of smallholder farm-families. At larger scales of production, dairying could be an important source of employment in areas such as marketing, processing and retailing, providing partial or total income for players in the dairy chain. In Kenya, for instance, every 1000L of milk produced generated full-time employments for 77 people in milk production and 3 - 20 jobs in processing and marketing and provided an average income 1.4 times higher than the Kenyan per capita GDP (World Bank, 2003). The dairy sector generates year–round income, ensures higher labour productivity and promotes women empowerment (Hill, 2017). Undoubtedly, the dairy industry when developed, could make a great social impact on poverty alleviation, agricultural growth, combat malnutrition and increase the income levels of small-holder farm families in sub-Sahara Africa.

It is often said that the socio-economic benefits of dairying are attained at an ecological cost. It is worth noting, however, that over 77% of feed for dairy animals in SSA is human–inedible pastures and straws which grow in rangelands. Moreover, a higher proportion (52 - 67%) of farm-based greenhouse gas emissions from dairy farms is methane, a relatively shorter-lived gas compared to CO_2 (5-10%) (FAO, 2010; Hill 2017). Invariably, several examples across the globe have demonstrated that improvements in breeding, feeding and management systems could increase milk production with reduced animal numbers, improved biological efficiency and, consequently, reduced environmental footprint (Hill, 2017).

Status and trends of milk production in Africa

Majority of the world's low-income tropical livestock producers are in Sub-Saharan Africa and South Asia where dairy is produced in mixed crop- livestock systems, ranging from low-input, extensive grazing to more specialized intensive enterprises (McDermott *et al*., 2010). Intensive systems are common in countries such as Sudan, Egypt, Kenya, South Africa and Algeria which are the top milk producing countries on the continent in terms of milk volume, producing about 52% of total African milk (Shittu et al., 2008). Apart from southern Africa, where high outputs have been reported, the rest of Africa is struggling to meet the milk demand of their respective countries. Much of the milk produced from extensive system is for home consumption or for sale at local markets, with only 5% of milk produced sold through commercial markets (USAID, 2013).

Nevertheless, milk production on the continent has doubled from 1996 with major growth taking place in North Africa, Kenya and South Africa with the other countries in Sub-Sahara Africa experiencing high relative growth but from an extremely low level (PM Food and Dairy Consulting, 2014). Even though local production increased by 16.8% between 2005 and 2017 (1.5% per annum) (Fig. 2a), undoubtedly, due to increased number of milk cows by 27% (2.5% per annum), demand far outweighed supply. Meanwhile, milk output for 2018 has been estimated at 45.7 million tonnes, almost unchanged from 2016, with higher outputs in South Africa, Algeria and Tunisia that were largely offset by lower production in Sudan, Ethiopia, Somalia and Tanzania (FAO, 2018). Shittu et al. (2008) reported an average milk yield of 461kg ECM per cow, which was only one fifth of the world average yield. An analysis of milk yield data from 2006 – 2016 showed a decrease of 8.1% (an

annual decreasing rate of 0.74%) for Africa whereas Europe and the world saw an increase of 2% and 11%, respectively, with a decreased milk cow population of 6% in the case of Europe (Fig. 2c).

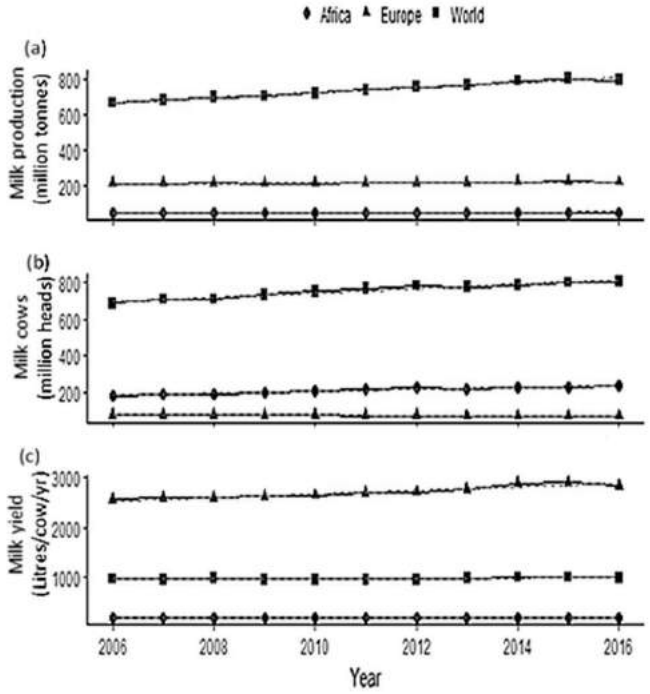

Fig.2: Changes in milk production (a), milk cow population (b) and milk yield in Africa compared with Europe and the world (2006 – 2016). Source of data: FAOSTATS (2018)

The decreasing trend in milk yield in Africa could be attributed to the negative impact of climate change on feed resources and animal performance (Hidosa and Guyo, 2017) since majority of dairying in Africa is weather-dependent, and probably, due to deterioration of genes responsible for milk yield. The low milk production by SSA has led to huge imports of milk and milk products by many countries to augment local supply (Fig. 3). With this development being exacerbated by continued climate change, measures are required to increase milk production drastically in SSA to meet the increasing demand.

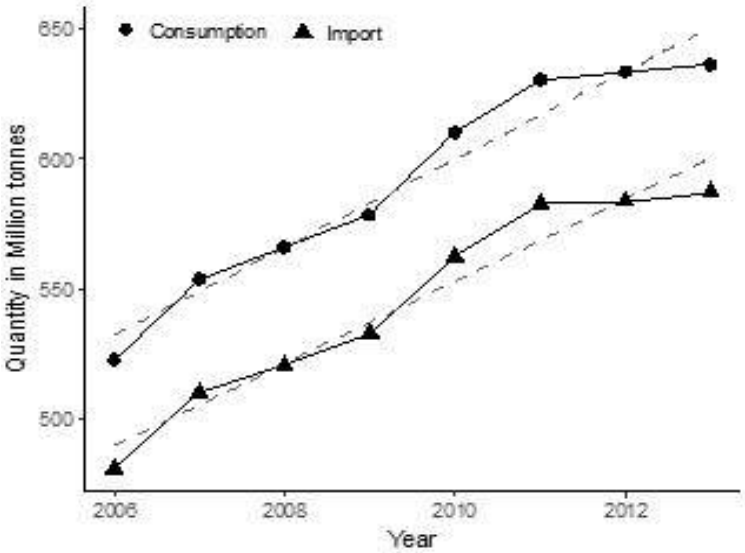

Fig. 3: Milk consumption and imports trends in Africa Source of data: FAOSTATS

Improving dairy production in SSA

It is suggested that the nature of the yield gaps in the dairy sector of Africa provides opportunities to increase production past the current attainable yields despite the constraints being faced by the dairy sector (Mayberry et al., 2017). However, the right policies, marketing systems and technical support are needed to stimulate development in the dairy sector of SSA (ILRI, 2003). One of the major setbacks to development in SSA's dairy sector is the large number of local breeds with low milk-yielding capacity. Milk productivity of these local breeds has been below 200 liters per cow per year against 12,500 liters in some developed countries (Davis Jr, 2018), although differences in production parameters exist. A study in one sub-Saharan country showed that almost all cattle were local breeds, with crossbred and exotic breeds such as Holstein-Friesian and Jerseys comprising only 1.3% of the national cattle herd (USAID, 2013). Replacing local livestock breeds with crossbred animals or exotic breeds is a plausible strategy to increase yield per cow. Selection of such productive breeds must be based on both economic and environmental considerations to ensure success.

Another challenge is the dominance of traditional systems for milk production which account for over 90% of dairy production in Sub-Saharan Africa (Olaloku and Debre, 1992). These smallholder dairy production systems vary significantly according to the location, agro-ecological zone and socio-economic conditions (Gizaw et al. 2016). More than 80 per cent of farms in SSA are less than two hectares in size (Lowder et al., 2016). The small size of farms and their low level of credit worthiness create difficulty for producers to access credit. It is suggested that smallholder farmers pool resources together through cooperative systems to ensure economies of scale, and consequently enhancing efficiency, productivity and market access. Banks could also assist in creating platforms to provide credit to dairy farmers and potential actors in the dairy value chain.
The major limitation to ruminant production in many
tropical regions of Africa is poor nutrition. The productivity of animals is restricted by the low nitrogen and high fibre content of native grasses and crop residues which form the basis of the diets in these regions. The problem becomes aggravated during the dry season when pastures, cereal residues and maize stover are limiting in nutritional quality. Interventions such as improving livestock nutrition is, therefore, one effective strategy to improve milk yield and production. Communal grazing lands could be improved by reseeding of natural pastures with perennial herbaceous legumes to increase nitrogen supply to both soils and livestock and to ensure soil carbon sequestration. In more intensive production scenarios, nutrition could be improved by increasing the amount and quality of supplements offered to livestock and increasing the nutritive value of crop residues by growing improved cultivars with higher metabolisable energy content (Anandan et al., 2013).

Conclusion

The dairy industry has the propensity to create wealth for SSA; and governments of African countries must play a lead role in the transformation agenda. Investment in scientific research has been very low in sub-Saharan Africa, making it difficult for the development of home-grown technologies and policies to change the dynamics of dairying on the continent. With the continent already experiencing adverse impact of climate change, it is important to tackle the emerging issues of reducing feed quality and quantity, diseases and environmental stress which are known to adversely influence milk production. African governments must be committed to ensuring extension of transportation infrastructure to dairy production areas for quick transport of milk to processing facilities, ensure cheap and reliable energy supply to processing plants, subsidize transportation cost and stabilize fuel price. Governments should ensure that farmers have access to improved dairy breeds and pest and disease management strategies. Regulations and policies are needed to safeguard grasslands which are a major resource for the dairy industry. Proper grazing

management systems must be adopted to increase yields, ensure yield stability and enhance ecosystem services. The current wave of population growth, land shortage and increasing interest in production and consumption is expected to stimulate emergence of market-oriented dairy systems to ensure that sub-Saharan Africa derives the full benefits of dairy farming.

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