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The Informal Camel Milk Marketing Sector in Kenya and Somalia

The importance of camel¹ milk as a source of nutrients for pastoralist communities in arid regions of Kenya and Somalia is well documented. Compared to cow's milk, camel milk keeps better. This allows transport and trade of non-chilled raw camel milk over long distances. The rise in numbers of urbanized and sedentary (ex-)pastoralists is creating an ever growing market demand for camel milk, a regular commodity in informal Kenyan and Somali markets. Income generated by pastoralist households from sales of camel milk is on the same scale as income from sales of livestock. The informal camel-milk value chain, described in this article, is dominated by milk women, who stem from pastoralist communities but who have lost their traditional, livestock-based livelihoods. Camel milk sales represent the main if not the only source of income for these often female-led households. Improving milk handling and hygiene at production, transport and retail level can potentially increase the incomes of camel milk value-chain actors.

Several aspects of camel milk production and marketing in Somalia and Kenya are discussed in this paper, which also looks at intervention strategies aimed at strengthening the camel-milk chain.

THE SIGNIFICANCE OF CAMELS IN KENYA AND SOMALIA

Two thirds of the world camel population is found in the Greater Horn of Africa. Somalis were the first people to keep camels in Africa (Bulliet 1990). They occupy a vast arid region, the "Somali ecosystem", shared by Somalia, Djibouti, Kenya and Ethiopia. With an estimated camel population of 6.3 million (GFA 2005) Somalia alone accounts for one third of the global dromedary camel population or about half of the African camel population (FAO 2004 FAO-STAT data, FAO/WB/EU 2004) and is the largest producer of camel milk in the world (FAO 2010). The human population in Somalia is estimated between 6.4 (GFA 2005) and 7.4 million (UNDP Somalia 2005). In north Somalia (discussed in this paper) 82% of the human population depends entirely on mobile livestock keeping (GFA 2005). For Kenya the camel population is estimated at a million animals with three million Kenyans depending on mobile livestock production for their livelihoods (Republic of Kenya 2005). Since the 1960s, camel keeping has gradually gained in importance in East Africa, in parallel to the decline of cattle-rearing pastoralist economies (Sperling 1987). Between the 1970s and the 1990s the arid parts of Kenya experienced a 12% reduction in cattle, sheep and goats versus an 18% increase in camels (FAO 2002).

Under arid conditions in Kenya and Somalia, camels have lactation periods between nine and 18 months (Simpkin 1996, FAO/WB/EU 2004, Farah/Fischer 2004, Farah et al. 2007) and produce four to five times more milk per annum than cattle (Dahl/Hjort 1976, Pratt/Gwynn 1977, Stiles 1983). In such environments goats lactate only three to four months per year (Baumann et al. 1993) while cows play a very limited role as dairy animals (FSAU 1990). Camel milk represents an important staple food and is a major source of animal protein and vitamins for more than 6.2 million pastoralists in Kenya and in Somalia (Farah et al. 2007, Field 2005;

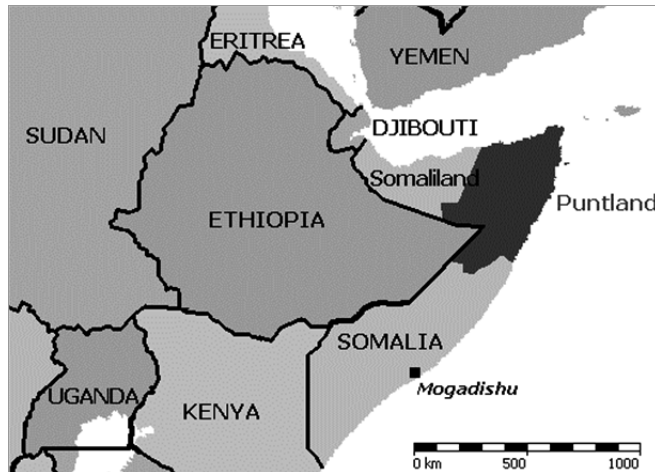
¹ In this paper the term camel always refers to the dromedary (*Camelus dromedarius*).

see picture 85). The importance of camel milk is further highlighted by the fact that 12.5% of the total milk available for human consumption in Kenya is produced by camels (Hesse/MacGregor 2006).

CAMEL MILK PRODUCTION AND MARKETING IN KENYA AND SOMALIA

In north Kenya the total value of milk (predominantly camel milk) is more than double that of meat in the pastoral economy (ICTSD 2007). Driven by the ongoing sedentarization and urbanization of pastoralists and the enormous influx of Somali refugees into Kenya, informal marketing systems that commercialize camel milk evolved almost simultaneously in Somalia and in Kenya (Herren 1990, FAO/WB/EU 2004, Farah et al. 2007) and have many similarities in both countries. Low average milk yields of only 2.5 to 4 liters per day and the high mobility of milk-producing herds result in often erratic camel milk supplies unable to meet the market demand for camel milk on a regular basis (SNV 2008). The absence of infrastructure in camel milk producing regions and the volatility of camel milk supplies have so far prevented the emergence of significant formal camel milk marketing and processing in Kenya² and Somalia. Camel milk production for commercialization to distant markets is mostly concentrated in the more accessible fringes of the camel-keeping regions with easier access to tarmac roads (e.g. Isiolo and Bangali in Kenya). While the camel milk production potential of herds on remote pastures may be underexploited locations favorable to milk marketing are frequently over-stocked (SNV 2008) resulting in degradation of woody and herbaceous vegetation. Camel milk supply peaks towards the end of the two rainy seasons (May/June and November/December) and for a short time markets may experience a glut, with camel milk prices dropping too low to justify transport costs. During these short periods of surplus, camel milk is not sent to markets but is consumed in large quantities by pastoralist families, to some extent offsetting prolonged periods of malnutrition. Some milk producers also resort to opportunistic sales, directly targeting travelers along roads in the production regions. There is anecdotal evidence that surplus camel milk is occasionally used to fatten lambs, but in 15 years of extensive travel in north Kenya and in Somalia the authors have never witnessed this practice. Under traditional camel milking management, the morning milk yield is higher, due to separation of the suckling calf from the dam overnight (Simpkin 1996). For Puntland (north Somalia, see graph 31) it was estimated that as much as two thirds of the camel milk produced can be marketed, with 30% of the marketed camel milk sold directly from producer to consumer; 68% sold to collectors and traders and 2% sold to restaurants and teashops (Farah et al. 2007). Transport distances between milk-producing regions and final markets can vary from 40 km to more than 400 km, while bulking points are often located between 10 km and 80 km from production sites. Distances up to 10 km to primary milk-collection sites (see picture 86) are normally covered on foot or by donkey (Adongo et al. 2009). Transport to secondary collection points and to bulking sites uses public transport vehicles, operating along dirt roads and onward long distance transport to urban centers is mostly by bus on tarmac roads. Due to very high temperatures and considerable distances large milk traders in Puntland hire or own special milk-collection vehicles that travel at night to take advantage of cooler temperatures. In response to this, camel-milk producers in Puntland milk long before sunrise to fit the transport schedule. This phenomenon is also starting to be observed in Kenya. Faster and more efficient milk transport reduces spoilage rates and increases profit.

² Despite a relatively well developed infrastructure, more or less stable cow milk production volumes and a modern milk-processing industry over 80% of cow's milk produced in the Kenyan highlands is marketed informally. The underlying economic reasons (Leksmono et al. 2006) apply even more to camel milk marketing and will be discussed in the conclusion.



Graph 31: Map of Somalia showing the two semi-autonomous regions of Puntland and Somaliland where the Somali Pastoralist Dairy Development project is located.

During the dry season milk collection and transport have to be extremely flexible to keep up with the high mobility of milk-producing herds in constant search of pasture, an absolute necessity to maintain lactation in the absence of feed supplementation. The camel-milk value chain is mostly organized along kinship lines and is based on a certain level of mutual trust. Groups of women from the same community collaborate in the collection, transport and distribution of milk and often supply to permanent urban camel-milk buyers. In terms of managing her financial assets each milk-woman represents an independent microenterprise. Milk collectors and traders are mostly female while milk transport is an almost entirely male monopoly (drivers, vehicle owners). The informal camel-milk value chain comprises:

- Mobile pastoralist producers
- Highly mobile primary collectors operating at pasture level
- Partly mobile secondary collectors operating at permanent or semi-permanent settlements
- Brokers and stationary milk bulkers operating in rural towns on or very near to tarmac roads
- Transporters operating public transport vehicles and busses
- Urban wholesalers, distributors and retailers
- Urban milk consumers

All actors involved in camel-milk production and marketing reap a certain profit and the camel-milk chain provides considerable income opportunities, especially to women. The social network allows for payments (in cash, occasionally in kind) and empty milk containers to be sent back from urban markets to producers and collectors in distant locations via public transport and intermediaries. Nonetheless, milk containers can be damaged or lost and milk payments to producers and primary collectors in the production region are often delayed for long periods (Abdillahi 2009). Defaulting on milk payment appears to be influenced by the degree of urbanization and the social environments. Abdillahi (2009) mentions 15% defaulting on milk payments in the rural Isiolo town versus a 30% likelihood of defaulting in the metropolitan Nairobi-Eastleigh camel-milk market.

Milk prices fluctuate seasonally according to milk supply, which is dictated by rainfall and calving cycles. Prices can also vary on a short-term basis as a result of impassable roads (heavy rain, insecurity). In urban milk markets camel milk fetches higher prices than cow's milk. The preference for camel milk is partly based on medicinal properties traditionally ascribed to it (SNV 2008). Camel milk is sold either fresh or sour, with fresh milk higher priced than sour milk (KARI/KASAL/MDG 2009). Fresh camel milk is consumed raw, but a considerable amount is used in tea (SNV 2008). Spontaneously fermented camel milk (Somali *Sussa*) of very variable quality and acidity is also sold in urban markets. Camel milk markets are mostly located in the open along dusty and dirty roads. Due to high environmental temperatures and high

levels of bacterial contamination, camel milk has to be distributed and retailed as quickly as possible. Most camel-milk markets operate for only a short time. Immediately after milk has arrived by public transport some of it is delivered directly to large restaurants, hotels and to customers with standing orders. Larger towns have several informal camel-milk markets serving a particular quarter (see picture 87). Consumers attempt to buy the freshest milk available but expect it to go sour quickly. Sour camel milk is typically consumed after sweetening with sugar. Due to the buyers' preference for fresh milk, prices immediately after arrival of the milk are higher than those one or two hours later. The duration of transport between production sites and terminal markets is perhaps the single most important factor affecting profits from camel-milk sales.

Volatile milk prices are a constant source of disagreement between producers, collectors and traders about the actual prices achieved on a daily basis and the daily milk money payments due (Abdillahi 2009). In some cases sour and/or highly contaminated milk of very low market value may be returned to producers (Adongo et al. 2009). Contrary to some claims (SNV 2008), camel milk that is too sour for consumption does not go to waste, but is used in cooking.

In 2008 prices for informally traded raw camel milk in Nairobi-Eastleigh reached 80 Kenya shilling per liter (€ 0.80, SNV 2008), while one liter of packed, pasteurized cow's milk in Nairobi's supermarkets sold at 55 Kenya shilling. The most dynamic urban camel-milk market in Kenya is Garissa town, the administrative headquarters of Kenya's Northeast Province, inhabited by ethnic Somalis. In 2008 Garissa received camel milk from three districts transported daily by 15 trucks, 20 pick-ups/Land-Rovers and five minibuses. An estimated 1200 women were involved in the distribution and retail of between 40,000 kg (dry season) to 70,000 kg (rainy season) camel milk daily (Shalle 2009, A. Bruntse ALLPRO project direct communication).

CAMEL MILK HYGIENE AND QUALITY

The quality of camel milk depends on the hygienic conditions during milking, transport and retail. Potential consumer health hazards originate not only from infected camels (zoonotic diseases, mastitis pathogens)³ but to a considerable extent from post-milking contamination related directly to the type of container used for transport (Younan et al. 2003). Basic awareness of milk hygiene is mostly lacking among camel-milk traders, but also among most camel-milk consumers. Boiling of camel milk before consumption is unacceptable to traditional consumers, who regard it as a degradation (Kagunyu 2009). The widely practiced consumption of raw and of spontaneously fermented camel milk represents a major health hazard, in particular to children (Schelling et al. 2003, Weller 2007, Abdelgadir et al. 2008, Kaindi 2008).

To delay the onset of souring and to safeguard market value, traders attempt to compensate camel-milk hygiene deficits by briefly heating the milk to boiling point (Mohammed 1993) or by intermediate chilling of raw milk at bulking sites before long distance transport (Isiolo town cooling hubs offer milk chilling for a fee). Urban hotels and restaurants that procure larger volumes of raw camel milk also boil it immediately to ensure that it can be used in tea for a certain period. There is evidence that antibiotics (Tetracycline powder) and alkaline salts (Magadi salt) are added to raw camel milk to suppress fermentation and delay souring during transport (Younan, personal observation in north Somalia).

Three types of container are used for storing and transporting camel milk:

- Plastic jerrycans
- Metal cans, often poor quality steel with seams and without tightly fitting lids
- Traditional containers made from woven fibers, wood or gourds (see picture 88).

³ One milk-borne disease is brucellosis, which leads to chronic infections that are fatal unless treated. Mastitis pathogens (streptococci, staphylococci) are potentially dangerous, especially for small children.

Traditional milking buckets and milk storage containers used at milking sites are sanitized by heat. Picture 89 shows this systematic treatment of the inner surface with a glowing wooden stick followed by “smoking” over the embers in inverted position. Total bacterial counts (TBCs) in correctly heat-treated traditional milking buckets and storage containers can be within EU raw-milk quality requirements (Younan et al. 2003). Camel milk from heat-treated traditional containers acquires a distinct smoky flavor, regarded by most camel-milk consumers as an indicator of good quality. Traditional containers are unsuitable for vehicle transport, comparatively expensive (labor-intensive) and limited in supply. Plastic transport containers are typically recycled 3 ltr and 5 ltr cooking-oil jerrycans, often leftovers from food-aid distributions. Such cheap, single-use items are not intended for repeated use by the manufacturer. These plastic containers cannot be cleaned effectively, because the opening is too narrow for a hand or brush to pass through and the handle is hollow. Due to water scarcity and very poor water quality in the production regions and at urban markets, “washing” of plastic milk containers is at best symbolic (see picture 90). In exceptional cases milk-women use hot water to flush the containers. The transfer of clean camel milk into plastic transport containers leads to a rapid surge in contaminating bacteria (Younan et al. 2003).

At a recent pastoralist forum in Garissa/Kenya (2010) female participants expressed concern about rising rates of throat cancer in children, which they attributed to the common use of such recycled plastic containers for transporting milk and water. The recycled plastic containers owe their popularity to two simple advantages:

First, they are light and occupy little space (plastic jerrycans with milk are commonly transported hanging on the outside of public transport vehicles), which reduces the transport fee. Secondly, they are low value – the loss of milk containers is only a minor economic risk, and sometimes the plastic container and milk are sold together as one product.

Type of container from which milk was dispensed by retailers in the urban market*			
Plastic jerry can	Open metal pot ‘Sufria’	Metal can with lid	Traditional container
449 (75%)	119 (20%)	32 (5%)	0

Table 14: Container types used at Burao milk markets, Somaliland (SPDDP 2007). * n = 600 milk-women

Camel milk for marketing is produced and collected mostly in the very early morning, while evening milk is normally kept for home consumption. Morning milk transported immediately after milking reaches markets faster, is less likely to go sour and fetches higher prices. Sometimes milk from the previous evening may be pooled with fresh morning milk, which accelerates spoilage of the whole milk batch. Traders are well aware of this problem and sometimes offer price incentives to producers to ensure that morning milk is kept and transported separately from evening milk. Willingness of camel-milk consumers to pay for better quality has been documented and is related directly to the freshness of the milk, the absence of milk adulteration (no added water!) and freedom from visible contamination (Wayua et al. 2009). Improved raw milk hygiene also results in better quality of spontaneously fermented camel milk, and good quality sour milk can fetch prices close to those for fresh milk.

The common poor hygiene, especially during milk transport but also when dispensing milk from transport containers, is the most significant factor negatively affecting potential incomes from camel-milk sales. In Puntland only 20% of the marketed milk is sold as fresh milk while 80% is sold in fermented form (Farah et al. 2007). The largest camel-milk market in Puntland, Bosaso, situated far from the producing region, receives mostly sour camel milk, which cannot be used in tea. As a consequence camel milk loses significant market shares to imported milk powder and to imported ultra-heat-treated (UHT) cow’s milk, which can be kept for long periods without cooling. This competition between fresh camel milk and imported milk powder and/or UHT milk is found in all milk markets in the region.

CONCEPTS TO STRENGTHEN THE CAMEL-MILK CHAIN

A large number of poor pastoralists and especially women are economically dependent on the camel-milk chain. Development projects, mostly implemented by NGOs, are aimed at strengthening the camel-milk chain in order to improve incomes of the poor. Past and current development interventions operate under three basic paradigms:

- A considerable surplus of unmarketed milk exists in the production regions;
- Value addition (processing, pasteurization, packaging) leads to increased incomes;
- Improving milk quality and milk hygiene improves market value and incomes.

SURPLUS UNMARKETED CAMEL MILK IN THE PRODUCTION REGIONS

The perception of huge untapped camel-milk production volumes, shared by some development planners, is based on unsubstantiated claims that “50% of the milk is not extracted from the udder” (SNV 2008). Obviously, camels nearer to markets tend to be more intensively milked than animals kept in more remote locations, indicating that a certain unexploited milk production reserve may in fact exist (Farah et al. 2007). But in the absence of adequate supplementation, negative effects of more intensive milking on health and fertility of milking camels quickly become obvious to camel owners (Herren 1990). In the overstocked Isiolo milk catchment in Kenya this has led to the emergence of a “division of labor” between commercial “intensive” milking camel herds (the focus is on producing as much milk for the market as possible) and traditional “extensive” camel breeding herds, which supply lactating camels or pregnant heifers to the commercial herds (Shibia 2010). Exchange of female camels between the two systems in accordance with their lactation status is also practiced (dry animals sent to remote pastures, only lactating animals kept near the market).⁴

A seasonal camel-milk glut may occur after rains have ceased and last for less than four weeks. In extensive milk-production systems only about 40% of a lactation is available for human consumption if consumption by the suckling calf is included (FAO/WB/EU 2004). More than half of the milk produced is consumed in the production region, by pastoralist families and by local customers, and hence is not available for urban markets (Farah et al. 2007).

There is no doubt that improved road infrastructure in the production regions and locally available cooling of raw milk (evaporative cooling, cooling powered by solar electricity or by the national electric grid) will improve market access for camel-milk producers in more distant regions, expand camel-milk catchments and result in overall increase of marketed camel-milk volumes and total income generated by camel-milk value-chain actors in the future.

INCREASING INCOMES BY ADDING VALUE TO CAMEL MILK

Current camel-milk retail in informal markets operates on roadsides or from simple stalls without a cold chain. Camel-milk shops are still very uncommon and even those that exist are often not equipped with appropriate dispensing utensils and refrigeration. At home the vast majority of camel-milk consumers do not practice any milk refrigeration but use fresh milk immediately after purchase (e.g. in tea) and consume leftovers later as (sweetened) sour milk. If kept under high ambient temperatures, pasteurized and packed milk does not ferment spontaneously but undergoes very rapid spoilage with proteolysis, production of gas and ballooning of the milk package, which makes the milk unfit for human consumption. Traditional camel-milk consumers used to the spontaneous souring of purchased raw milk are not familiar with packed milk that requires continuous cooling. This basically rules out the marketing of packed pasteurized

⁴ A more extreme version of such a division of labour is found around Nouakchott, Mauritania, where stationary commercial camel-milk producers buy lactating female camels from mobile pastoralists and sell them for slaughter at the end of lactation.

milk or yoghurt⁵ via existing retail channels, even more so in a hot tropical climate. Yoghurt sold fresh without packaging and sour camel milk produced through controlled fermentation are two simple processing options with the potential to increase profits for urban camel-milk bars. Thermo-tolerant starter cultures should be developed that do not require freezing for storage and are available in small packages; this would significantly lower the necessary investment for small-scale processors interested in producing and selling camel-milk yoghurts and sour milk (David Stroo, Marketing Director, Christian Hansen A/S, Hørsholm, Denmark, direct communication).

One traditional value-adding method practiced in Kenya and Somalia is the extraction of butter fat (ghee), using seasonal surplus cow's and goat's milk. Camel milk is not commonly processed into ghee for marketing (Farah et al. 2007, SPDDP report 2007). Compared to goat's and cow's milk, ghee production from camel milk is rather inefficient and poses certain technical difficulties related to the melting point of camel-milk fat (Farah/Fischer 2004). Technical difficulties can be overcome by using a (manual) centrifuge and warming up the milk. But consumers rank goat's milk ghee highest in value, followed by cow's milk ghee, with camel-milk ghee being ranked lowest. Processing the most expensive raw milk, camel milk, into a product of low market value does not make economic sense.

Production of cheese was traditionally absent from Kenya and Somalia and cheese is still a niche market in the region. Camel-milk casein forms a comparatively soft and unstable curd, which poses problems to efficient cheese production. Validated protocols for camel-milk cheese making are available but require a specific rennet that requires cold storage (ibid.). The resulting camel-milk cheeses are at best similar to cheeses made from cow's or other milk. Again, processing the most expensive raw milk into an at best average product, which has to compete with cheaper cow's milk cheeses for a limited market in the region does not make much economic sense.

Kenya's only camel-milk processing plant (Vital Camel Milk) in operation since 2005 (New Agriculturalist 2006) handles only insignificant volumes and supplies a small niche market in Nairobi supermarkets. Pasteurized, packed camel milk is sold at 120 Kenya shilling per 500 ml (€ 2.40/liter, current prices). The plant does not collect milk from pastoralist producers but relies on deliveries to the factory gates from ranch-based camel herds. The economic difficulty of running a profitable camel-milk processing plant in competition with a well-established, large informal camel-milk market is illustrated by the fact that Vital Camel Milk, with donor support, is currently venturing into camel-milk-based cosmetic products.⁶

Unlike in Kenya, where milk processing was established by a private investor, the first camel-milk processing plant in Somalia (Maandeq Milk Plant) was the result of a donor-funded project "Sustainable Improvement of Camel Milk Production and Trade" implemented by an NGO (UNA) in Gardo, Puntland, north Somalia, between 2001 and 2004. From the start the Maandeq Milk Plant lacked a clear economic concept and ownership structure (cooperative versus private business). Also the problem of how to secure cost-efficient regular supplies of raw camel milk from pastoralist producers in direct competition with the informal "street" market was never solved. While it was still operating, the Maandeq Milk Plant in Gardo was in constant competition with informal milk traders for raw milk supplies. The plant was leased to a private business (Karkaar Food Industries) in 2004, which uses the infrastructure for production of non-milk commodities. On two visits by one of the authors, in October 2006 and in January 2007, part of the cold-store capacity was leased to a camel-milk bulker for intermediate storage and cooling of raw camel milk destined for the Bosaso market. Though unsuccessful in terms of

⁵ In the absence of a cold chain, packed yoghurts behave essentially like pasteurized milk.

⁶ See for example <http://www.facebook.com/pages/Malaika-Beauty-and-Skin-Healing-Cr%C3%A8me/165448466851099> and www.malaikacosmetics.com.

improving the camel-milk chain in Puntland, the UNA project generated very valuable information.

The informal camel-milk chain can tolerate wide day-to-day variations in raw camel-milk quality, which affect profit margins but do not block the retailing. But for profitable milk-processing operations, widely fluctuating raw milk quality and quantity represent insurmountable obstacles. For efficient heat treatment and processing, a milk plant needs raw camel milk of constant good hygienic quality, which can only be obtained if the milk is chilled soon after milking. Without premium price payment systems and substantial investment in milk collection technology the raw milk quality required for processing cannot be supplied by camel pastoralists.

The risks and transaction costs of ensuring a regular raw milk supply from distant mobile camel-milk producers to fixed milk-processing units are considerable; even more so in an environment with hot ambient temperatures and a poor road infrastructure. For the very same reason the few operating commercial camel-milk processing plants are supplied either by semi-stationary pastoralist milk producers who keep camel herds within a 90 km radius around the processing plant and heavily supplement their animals (Tiviski/Mauretania), by lactating camels kept on commercial ranches (Vital Camel Milk/Kenya) or by camels kept inside permanent dairy farms that rely on bought in feed (Emirates Industry for Camel Milk and Products and Al Ain Dairy, both in the UAE).⁷

IMPROVED MILK QUALITY AND MILK HYGIENE INCREASES INCOMES

Improving hygienic conditions effectively contributes towards increasing incomes generated by all actors in the camel-milk chain from milk production and sales. Numerous NGOs are currently involved in development projects aimed at strengthening camel-milk chains in north Kenya (KARI/KASAL and MDG 2009) and in Somalia. *Vétérinaires sans Frontières Suisse* (VSF-Suisse) has been and still is working with camel-milk traders in north Kenya under successive projects. The latest VSF-Suisse camel-milk project reached 1590 beneficiaries and consisted of milk hygiene training, the provision of 3 ltr aluminum milk cans, of canvas transport bags (soaked in water to provide evaporative cooling during milk transport) and of appropriate dispensing utensils for retailing milk.

The camel-milk project of the Netherlands Development Organization, SNV, in Kenya supports the establishment of urban camel-milk bars with improved retail practices and increased profit margins through business training and access to micro-credit.

Since 2006 the Somali Pastoralist Dairy Development Project (SPDDP), implemented by *Vétérinaires sans Frontières Germany* (VSF Germany) in Puntland and in Somaliland, has focused on strengthening the camel-milk chain by preserving raw milk quality and market value through improved milk hygiene and transport conditions. It provided hygiene training, metal milk containers (3 ltrs, 5 ltrs, 10 ltrs sold at wholesale prices to milk traders) and established a network of milk collection centers with washing and cleaning facilities in important milk production areas. These milk collection centers are managed by local, predominantly female groups of milk traders and financed through a small levy charged per milk container (milk volume) passing through the center. (Equipping vehicles with affordable evaporative cooling technology is currently under discussion.) In addition, retail facilities at urban markets were improved through the construction of shaded milk halls with market stalls and washing facilities in major towns (Burao, Galkaayo). SPDDP also engaged local authorities to enforce minimum regulations for milk safety and quality.

⁷ See the homepages Vital Camel Milk <http://www.vitalcamel.com>, Tiviski <http://www.tiviski.com>, Emirates Industry for Camel Milk and Products (EICMP) <http://www.camelicious.ae> and Al Ain Dairy <http://www.alaindairyuae.com>.

A very relevant feedback from various development project experiences is that improved hygienic quality of raw camel milk does not necessarily increase retail prices. It rather attracts more regular customers to buy from a particular milk-woman, thus increasing her daily turnover and income (Biovision/VSF Suisse 2010). Another significantly positive effect on income observed by both VSF Suisse in Kenya and VSF Germany in Somalia is the higher percentage of milk sold daily as fresh milk at “premium” prices, rather than being sold sour. In Puntland the amount of fresh milk sold increased from an average of 20% before the introduction of improved milk hygiene to between 50% and 80% after hygienic handling and transport had come into use. One remaining problem is to ensure that camel-milk producers routinely receive their share of the improved profits and that they also invest into improved milking hygiene. The existing premium payment system for morning milk could potentially be expanded to provide incentives to milk producers for hygienically improved camel milk.

CONCLUSIONS

One cautious conclusion shared with others (SPDDP, Herren 1990) is that the duration and volume of the unmarketed camel milk surplus tend to be overestimated by development policy-makers, who often do not fully take milk consumption by the suckling camel calf and by pastoralists and their families into account. In the absence of supplementary feeding it is difficult to see how the currently low milk volumes available for human consumption can be substantially increased. Irrigation farming, traditionally absent in the East African region, is gaining ground in arid parts of Kenya and Somalia and is very likely to offer new opportunities for cost-efficient semi-intensive camel-milk production in the future.

Modern camel-milk processing operations disconnected from pastoralist producers and from the informal camel-milk chain, whether financed by development projects or by private business, are very limited in scope and currently do not improve incomes of camel-milk producers and other actors in the informal camel-milk value chain in East Africa. The most efficient value addition for camel milk in Kenya and Somalia at present is the safeguarding of raw milk quality and its market value during collection, transport and retail. Donor investments aimed at strengthening the camel-milk chain should support improvements in the infrastructure for milk collection and retail, coupled with enforcement of minimum milk-quality regulations by local authorities. If well targeted, such interventions have been shown to improve incomes of micro-enterprises involved in camel-milk marketing. Long-term investments in improved road infrastructure in arid regions, as is currently happening in north Kenya, will lower transaction costs and allow larger numbers of pastoralists to participate in the camel-milk trade. It will also result in camel milk being supplied from larger catchment areas, thus reducing if not eliminating the currently negative environmental impacts of “intensified” commercial camel-milk production.

Donor and policy support to camel-milk marketing in East Africa must avoid repeating misguided dairy policies of the past, which initially overlooked the importance of informal cow’s milk chains and focused predominantly on modern milk processing. Many of these past efforts failed to strengthen the milk value chain and did not benefit poor producers and traders (Leksmono et al. 2006). The information provided in this paper on the camel-milk marketing sector in Kenya and in Somalia is by no means comprehensive. Initiatives to develop the camel-milk value chain are implemented by very different actors (NGOs, governmental institutions, private investors, researchers). As a result the information generated during such interventions is fragmented, not widely published and scattered among a multiplicity of project reports and other documents. This involves the risk of different actors repeating the same mistakes, unaware of previous experience. Hopefully this paper will provide a basis for ex-ante assessments, decision-making and planning for future projects.

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