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A Report on the Camel Milk Marketing Clusters in Garissa

**Commissioned by CARE Kenya under Enhanced Livelihoods in the Mandera Triangle
(ELMT) Project**



Report compiled by SITE

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Executive summary

The camel milk industry has a lot of growth potential yet to be fully exploited in order to improve the livelihoods of the pastoralist communities. These communities place high cultural value on the camel and it is a sign of wealth. Camel milk harvesting presents an added opportunity to alleviate hunger while establishing a sustainable industry. The challenges in the industry can be overcome if all stakeholders play their rightful role.

CARE Kenya commissioned SITE to train camel milk marketing groups in Garissa, compile a list of appropriate milk handling equipment for possible future equipping as well as develop a marketing strategy for the milk marketing groups. The training was on hygienic milk handling and basic business skills aimed at building the capacity of the milk traders for improved quality. The training activities took place in 12 stations in the larger Garissa District over a period of ten days. Garissa is in Kenya's North Eastern Province and borders Somalia to the East.

During this assignment, SITE trained a total of 481 milk handlers on hygienic milk handling and basic business skills such as costing and marketing. In addition, a milk marketing strategy was developed to be used by the milk marketing groups and a list of appropriate milk handling equipment was also compiled.

Language barrier between the trainer and the trainees was a key challenge during the training. However, this was resolved by the presence of CARE's staff who helped with the translation. The Garissa-Fafi road became impassable due to the prevailing rains at the time. This was a challenge because one trainer and his translator got stuck on the road and spent the night in the car. As a result, training was not done in Fafi as planned.

Out of this training, it emerged that for the camel milk industry to grow, it is important to reorganize its operations and put in place concrete marketing strategies. The strategies should be both long and short term. The short term ones should focus on interventions with immediate results such as establishing milk canteens and training all the milk handlers in the entire value chain. Long term strategies would require more time to implement and results would not be immediate. They would entail phasing out the plastic and wooden milk containers for the aluminum ones which are easier to clean and sterilize. An additional long term strategy would be development of the formal segment of the industry for processed camel milk by starting a factory or partnering with existing ones.

Like in all milk industries, camel milk production fluctuates with seasons. Therefore, educating and sensitizing the producers on appropriate husbandry practices and simple techniques such as milking more than twice a day to increase productivity is important. Training of camel milk service providers would lead to production of high volumes of good quality milk since producers will learn the right camel husbandry practices.

SECTION I

Introduction

Care Kenya, along with the other partners of *Enhanced Livelihoods in the Mandera Triangle* (ELMT) Project; have been working with the pastoralist communities in Garissa and other districts in the Mandera Triangle in an effort to enhance their livelihoods. To achieve this, many interventions have been implemented. Training the camel milk handlers in Garissa on hygienic milk harvesting, handling, storage, transportation as well as basic business skills is one of the interventions under ELMT. SITE was contracted by Care Kenya to undertake training among other deliverables.

The camel milk handling groups in the larger Garissa district were the target in this assignment. 481 traders were trained and out of this, 473 were women (98%) while only 8 (2%) were men. The trainees fell into four categories – milk producers, primary milk collectors, milk transporters and secondary milk collectors. The milk producers are camel owners who milk and sell to traders. The primary milk collectors are traders who buy milk from the producers while transporters are private vehicle owners who ferry milk from the primary to the secondary milk collectors. The secondary milk collectors receive milk from the primary collectors via the transporters and sell to consumers.

The main objective of the assignment was to build the capacity of the camel milk marketing groups through specific interventions focusing on improving the manner in which the camel milk is purchased, collected, handled, stored, transported, marketed, distributed and sold in Garissa and elsewhere.

Expected deliverables

- i) Verification of information gathered by CK's rapid camel milk survey on one of the supply lines. This will build on the SNV camel milk value chain study recently completed but be specific to this group.
- ii) Train targeted members of the milk groups on safe and hygienic handling and storage of camel milk using a training manual/method approved by CARE Kenya in Garissa. Administer a post-training evaluation questionnaire.
- iii) Work with the camel milk marketing groups to develop an efficient and timely collection and distribution system of camel milk so as to reduce milk spoilage
- iv) Support the camel milk marketing groups to come up with a simple, effective and viable marketing strategy with appropriate branding, labelling and packaging as needed so as to serve existing clients better as well as reach new clients.
- v) Identify and advise CARE Kenya and the milk marketing groups on the basic equipment needed to promote safe and hygienic harvest and handling of the milk, as well as additional equipment for increasing milk preservation
- vi) Identify further training and support needs for the camel milk marketing groups.

- vii) Advise on the establishment of camel milk bars and arrange a cross visit to milk bars and link the traders to the Dairy Traders Association.
- viii) Advise on the way forward in getting Kenya Dairy Board policy formulation to include camel milk.

This report is divided into five parts, each part addressing a specific deliverable as follows:

- Training curriculum
- Training activities and recommendations
- Marketing strategy for camel milk
- Basic and appropriate camel milk handling equipment
- Recommendations
- Annexes

Presentation of the assignment in power point to Care Kenya was done on December 2 2009 and a soft copy submitted.

SECTION II

Training Curriculum

The training curriculum for the assignment was adapted to suit the uniqueness of camel milk. The pre-training visit was conducted two weeks before the actual training and helped to verify some of the information gathered in literature review. Attached to this document is the pre-training report as *Annex I*.

The curriculum was developed for the two modules as follows:

Module 1: Clean milk production, hygienic handling and testing

Delivery time: 6 hours

- Attributes of good quality camel milk
 - What good quality milk should have
 - What good quality milk should not have
- Factors contributing to camel milk spoilage
 - Sources of contamination
 - How to avoid contamination
- Personal hygiene practices
 - Dos and don'ts during milking
- Camel milk preservation at production level
 - How to handle milk after milking to preserve quality
 - How to store evening milk
 - Why evening and morning milk should not be mixed
- Some common diseases that can be passed from camels to humans through milk
 - How the diseases are contracted
 - How to prevent these diseases
- Equipment and materials for hygienic camel milk handling
 - Appropriate milk handling equipment
 - Proper cleaning of milk equipment
 - Tips for handling milk equipment
- Basic camel milk quality tests
 - Organoleptic tests
 - Clot on boiling test
 - Lactometer test
 - Alcohol test
- Safe storage and transportation of camel milk
 - Appropriate equipment for milk storage
 - Appropriate milk transport containers
 - Hygienic milk transportation means
 - Hygienic milk transport personnel

Module 2: Business Skills

Delivery time: 6 hours

What is a small-scale business?

- Defining a business and distinguishing the different types of businesses
- Characteristics of a micro-enterprise
- What causes the success/failure of micro-enterprises?

Reaching our customers

- Understanding the market
- The four Ps of marketing
 - Product
 - Price
 - Place
 - Promotion
- Importance of marketing

Planning for our businesses

- Defining a business plan
- Developing a simple business plan

Costing

- What are costs?
- Importance of costing
- Costing in our milk businesses

Record keeping

- What is record keeping?
- Why is record keeping necessary
- Examples of some records you can keep

Highlights of the training curriculum

Training curriculum

1. **Module I: Clean camel milk production, hygienic handling and testing**

- *Attributes of good quality camel milk*
- *Factors contributing to camel milk spoilage*
- *Personal hygiene practices*
- *Camel milk preservation at production level*
- *Some common diseases that can be passed from camels to humans through milk*
- *Equipment and materials for hygienic camel milk handling*
- *Basic camel milk quality tests*
- *Safe storage and transportation of camel milk*

2. **Module II: BASIC Business Skills**

- *What is a small-scale business?*
- *Reaching our customers*
- *Planning for our businesses*
- *Costing*
- *Record keeping*

i. Training methodology

The training covered two main modules and was aimed at helping the trainees acquire skills in hygienic handling of milk and running successful milk businesses. The approach used was participatory with emphasis on practical sessions on handling and testing of milk as well as cleaning of milk containers. There were discussions and experience sharing to make the training experiential. To accommodate the busy schedules of the trainees, learning session took three days with sessions of four hours every day. An interpreter was used due to language barriers.

At the end of the training, an exit questionnaire was administered. The trainees also outlined practices they would adopt or change based on the acquired knowledge and skills.

ii. Training aids

The following training aids were used:

- Flip charts
- Marker pens
- Note books
- Biro Pens
- Samples of Aluminium milk cans
- Milk measuring scoops/pints
- A fully equipped milk testing tool kit
- Camel milk samples
- Milk sieves/filters

SECTION III

Training activities and recommendations

1. Training activities

Training for the milk handlers took place in the training locations tabulated below. A training attendance form was used to gather some data and is attached to this report as *Annex II*.

Findings obtained from discussions and observations during the training are summarized below.

Findings from the training

No	Training location	Number of trained milk traders	Milk buying price/litre	Milk selling price/litre	Milk transport cost/litre	Milk volumes (litres)
Primary milk collection points						
1	Bura Nadhir	60	30	50	2.00	463
2	Kamuthe	36	40	60	3.30	545
3	Saka	48	40	50	5.00	721
4	Sankuri	33	40	50	5.00	424
5	Raya	60	40	50	5.00	1053
6	Shimbirey	30	33	40	6.00	950
7	Dujis	30	40	60	1.00	780
8	Hagarbull	30	40	60	5.00	397
9	Dertu	30	30	43	1.00	423
	Total	357	-	-	-	5,756
Secondary milk collection points						
1	Garissa ATC	42	60	70	N/A	1463
2	CK Conference	31	60	70	N/A	1230
3	CK Car Park	51	60	70	N/A	613
	Total	124	-	-	-	3,306
	G. Total	481	-	-	-	9,062
	Av/ trader	-	-	-	-	20 litres

The training took place in various locations as highlighted below;

i. Bura Nadhir

Sixty primary milk collectors were trained in this trading point and all were women. Each group member was trading an average of 5 litres of milk per day for six days. The women boil and sell milk individually during shortage but boil at a common point in peak season. They heat the milk indirectly using plastic containers dipped in a *sufuria* of boiling water.



The producers from the range lands deliver the milk between 10.00 am and 11.00 am while the milk transport vehicle arrives at 1.00 pm to ferry the milk to Garissa town.

ii. Kamuthe

Thirty six primary milk collectors were trained at this point and all were women. The women trade as a group throughout the week. They heat the milk indirectly using plastic containers dipped in a *sufuria* of boiling water. The women confirmed that camel herders observe poor personal hygiene and do not wash the camel udder at milking. Milking is done soon after the calf suckles since the calf stimulates milk let down.



A training session in Kamuthe

The women shared the following with us: herders just wipe off the calf saliva with their hands and proceed with the milking; the camel is stubborn and is unlikely to allow the milker to wash the udder; camel milk was never sieved and most pastoralists would drink it without boiling.

The primary milk collectors at Kamuthe sieve their milk while the community now generally appreciates the need to boil camel milk before consumption. However, the herders still drink raw milk while herding. Camels are milked on average four times a day: once in the morning, twice during the day and once in the evening.

The milk collectors at Kamuthe receive milk from 9.00 am to 11.00 am mostly from the Bura range lands (Tana River), a journey of 3 - 4 hours. The herders milk twice during the day and are free to drink the milk or sell it to any one who needs it. Evening milk is used as fresh milk for family consumption or to make *Susa/lala*. The producers smoke the milk containers with a firebrand from a selected herb. The smoke, along with the added charcoal residues, adds a unique flavor in addition to preserving the milk.

The collectors have two sets of milk containers since milk transporters return milk containers the following day. Every milk transport container has a hole on the lid and a string through the hole which is then tied to the container's handle as a way of ensuring the lid does not get lost once milk is delivered to the sellers in Garissa town. The only market for Kamuthe women is Garissa town.

iii. Sankuri

Thirty three primary milk collectors were trained at this point and were all women. The main sources of camel milk traded at Sankuri are Abaq Buul, Nunow, Bara and Labiga. The milk is transported from the range lands to the primary trading point using donkeys or human backs. The women test the milk through tasting before boiling. It is allowed to cool in the *sufuria* before packaging it in plastic containers of 5, 10 or 20 litres.

The milk filled containers are tied onto the sides of the vehicle with ropes and transported to the secondary collectors in Garissa town. The transporter makes one trip to town, sleeps over then makes a return trip the following day with money for the primary collectors and goods from Garissa town. It would be uneconomical for him to travel from town with an empty vehicle.

Highlights on the training

- A total of 481 camel milk handlers were trained
- 473 were women (98%) while 8 (2%) were men
- The training content was delivered in 10 days
- 12 milk trading clusters/groups were trained
- Each milk trading cluster had an average of 30 people,
- Each milk trading cluster was trained for 3 half-day sessions
- Each training session lasted four hours
- Three SITE trainers delivered the training
- Each trainer had a translator from Care Kenya,

iv. Saka:

Forty eight milk collectors were trained at this point and were all women. The producers are close to the trading points during the rainy season hence deliver milk at 6.00. During the dry season, the producers move away in search of forage hence deliver milk at 11.00am. Milk quality problems occur during the dry season due to the high environmental temperatures and the many hours between milking and delivery. The main sources of camel milk at Saka are Higlta, Massala, Habarrow, Maalim Hassan, Mathahliba, Hadley and Junction.

The primary milk collectors test the milk from producers through tasting before boiling in *sufurias*. Milk prices fluctuate seasonally but normally the primary milk collectors buy a litre of camel milk at Ksh 40.00 and sell it at Ksh 50.00. Transport charges are Ksh 100.00 for a 20 litre milk container. This translates to Ksh 5.00 per litre. A land rover provides the transport services but is unreliable during the rainy season. Saka area produces a lot of milk during the rainy season. However, the only market is Garissa town which is unable to absorb all the milk in peak seasons leading to losses through spoilage.



Milk Boiling in a Sufuria in Saka



A milk transport land rover in Saka

v. Raya

Sixty primary milk collectors were trained at this point and all were women. Milk sources for Raya include: Modika, Elkorey, Sankuri, Wel Adey and El Garas. Some milk is sourced near the Raya trading centre hence it is received as early as 8.00 am and sent to Garissa town immediately without boiling. Some milk producers in Raya use plastic containers for milking as opposed to their counterparts in the range lands who use the wooden containers.



A training session in Raya

They said the plastic buckets are easier to clean hence milk keeps longer in them than in wooden containers so long as the plastic lid is not firmly put in place.

Milk from distant sources arrives in Raya at 1.00 pm. The milk collectors boil and package it. They then keep it under a tree awaiting transport to Garissa town at 3.30 pm. The primary milk collectors confided to us that the afternoon milk occasionally goes bad because of staying for many hours exposed to high environmental temperatures since milking.

vi. Shimbirey

Thirty primary milk collectors were trained at this point and all were women. This trading point is situated in a busy centre along the Garissa- Manderu highway. Most of the milk is consumed in the centre while the rest is sold in Garissa town and occasionally in Dujis when there is shortage. The producers and collectors also sell milk directly to travelers along the Shimbirey – Garissa road at Ksh 50.00 per litre. The milk is sourced from the range lands of Kulis, Ramad, Muhumed Yaal and Yagola.



A training session at Shimbirey

vii. Dujis

Thirty primary milk collectors were trained at this point and all were women. The main market for these collectors is Modogashe, which is the district headquarters. Rarely, they sell milk in Garissa town especially in peak season. The Dujis milk collectors' experience milk shortage during drought since the producers move far into the range lands in search of camel forage where they sell milk to Saka and Sankuri. Thus milk collectors from Shimbirey are able to sell their milk at Dujis because of the shortage.

viii. Hagarbull

Thirty primary milk collectors were trained at this point and all were women. They sell their milk in both Garissa and Dadaab towns, with most milk going to Dadaab. Hagarbull is also a small active town patronized by truck drivers and other travelers on their way to Dadaab. Milk producers and collectors thus occasionally sell their milk to the truck drivers and other travelers on the Garissa – Dadaab road. This is a thriving local market with milk retailing at Ksh 60.00 to

the travelers. The primary milk collectors sell milk at Ksh 70.00 per litre in both Garissa and Dadaab towns but once in Dadaab town hotels; it costs Ksh 70.00 per glass.

ix. Dertu

Thirty primary milk collectors were trained at this point and all were women. The main market for the milk collectors is the Dertu millennium village while the rest is taken to Dadaab. Some milk is sold in Garissa town when the Dertu-Garissa road is passable but during the rainy season - when the road is impassable - most milk from Dertu is consumed locally and the rest sold in Dadaab. There is plenty of water at Dertu since the millennium village project has sunk a borehole. The Dertu milk collectors were planning to form cooperative for effective milk marketing.



Training at Dertu



A watering point in Dertu

x. Garissa town

The secondary milk collectors trained in Garissa town were 124. Out of this, only 8 were men. The trained traders are only a small fraction of the many secondary milk collectors in Garissa town. They trade at the Garissa milk shade which was put up by a local bank - the First Community Bank. There are many other secondary milk collectors in the town who trade along the Garissa - Manderu highway at specific points. There are also vendors who buy milk from the secondary collectors and sell to hotels and consumers in the estates. All the milk received in Garissa town is consumed within, specifically in: Garissa Ndogo, Garissa town, Iftin town, Soko ya Ng'ombe and the surrounding estates. Milk is never enough to satisfy the local demand during drought but there is excess in peak season which goes to waste by fermenting spontaneously into *Susa/lala*.

Most of the camel milk sold in Garissa town comes from two main sources:

a) Greater Garissa catchment area: this comprises of the primary milk collection points of Saka, Sankuri, Raya and Shimbirey. Dujis, Hagarbull as well as Dertu primary milk collection points deliver only a small portion of their milk to Garissa town because they have alternative markets. Dujis primary milk collectors sell their milk in Modagashe while traders in Dertu and Hagarbull sell most of their milk to Dadaab.



A training session in Garissa town

b) Greater Tana River district:

- Bura East Route: this is an important source of milk into Garissa town. These collection points are Jembele, Kamuthe, Bura Nadhir, Nanigi, Bilbil, Kora Kora and Warable.
- Other sources of milk from Tana River into Garissa include: Hasaqa and Bura Dima on the opposite side of Saka – Sankuri – Raya route along the Tana River.
- Milk sources along the Garissa – Mombasa highway into Garissa include; Hambarase, Jardentu and Bura Tana.
- Bangali milk collection point on the Garissa- Nairobi road is also in Tana River and milk from Bangali is sold in both Garissa town and Nairobi’s Eastleigh Estate.

2. The Garissa Milk shade

There are many secondary milk collectors in Garissa town who trade inside and around the Garissa milk shade which is adjacent to the Garissa – Mandera highway.



Garissa milk shade

It has a roof which shields the women and their milk against the strong sun. However, it is not cemented and has a leaking roof. It has no water and no drainage system. It is a long structure measuring approximately 30 metres long and four metres wide. The roof slants slightly backwards with the front and rear wall measuring four and three and a half metres high respectively.

Highlights on Garissa training

- *Garissa town milk traders transact inside and outside the First Community Bank milk shade*
- *the milk shade was constructed by the First Community Bank*
- *the shade is 30 metres long and 4 metres wide*
- *the roof slants slightly at a height of 4 m at the front and 3.5m at the rear*
- *the roof leaks when it rains*
- *it is not cemented and no water is provided*
- *it stands on a road reserve*
- *the larger Garissa and Tana River catchment areas supply milk to the town*
- *camel milk retails at Ksh 40 in Garissa town during peak periods*
- *camel milk retails at Ksh 80 in Garissa town during times of drought*

3. Evaluation of the training

A questionnaire was administered the traders at the end of the training to obtain feedback from them. A sample of the evaluation questionnaire is attached to this report as *Annex III*.

- All the trainees rated the presentation methods of the trainers as good or very good.
- The milk collectors trained in Garissa town, Bura Nadhir, Kamuthe and Dertu felt the training should have been delivered in more than three half days. The rest of the groups were comfortable with the time allocated to the training.
- On areas that are relevant but were not covered during the training, the milk collectors listed the following areas: processing camel milk into yoghurt and *lala/Susa*, establishing a camel milk canteen as well as managing milk groups.
- All the milk collectors said the training was relevant to their businesses since it opened their eyes to new milk testing methods, the need to trade in high quality milk that can access outside markets. They also found the business skills training relevant to them so that they can run profitable milk businesses with a clear growth plan.
- Milk testing was rated the most useful training by both primary and secondary milk collectors, followed closely by personal hygiene practices, basic business skills such as basic camel milk marketing and record keeping. The trainees also appreciated the topic on the diseases spread through consumption of raw or inadequately boiled camel milk and the need to milk healthy camels.
- They promised to put much of the training into practice as follows: form registered trading groups, share the information on hygiene with the milk producers, start keeping records in their businesses, observe strict hygiene as they eye markets outside Garissa, use the right milk handling equipment, start boiling their milk indirectly as well as run successful businesses through cost reduction especially transport costs.

- During our wrap-up meeting with the Care Kenya, Garissa team, they expressed satisfaction with the training by the SITE trainers. They requested SITE for training reference material as they follow up on the trained traders.

Highlights on the training evaluation

- *All the camel milk handlers trained rated the training methods of SITE trainers as very good or good*
- *3 trading groups felt the training should have been delivered for more than 3 half days*
- *All the milk traders rated the training as useful to their milk businesses*
- *Milk testing was rated the most useful training by the trainees followed by personal hygiene practices*
- *All traders promised to put the acquired knowledge into practice*
- *The Care Kenya ELMT team in Garissa expressed satisfaction with the training and requested for training reference material*

4. Exposure visit for Garissa camel milk handlers

The exchange visit took two days starting from November 20th 2009. Twenty milk traders from different milk trading clusters in Garissa visited milk bars in Pangani and Ngara area of Nairobi,



Garissa traders in Pangani milk canteen

the national office of Dairy Traders Association and milk traders in Pumwani area of Nairobi. The objective of the visit was to expose the Garissa traders to possibilities of marketing milk outside Garissa as well as establish linkages with other milk traders. The meeting with the Dairy Traders Association (DTA) was important for purposes of self-organization for the Garissa traders. The traders appreciated the visit to the milk bars where they sampled the several milk products on offer such as yoghurt, lala, fresh milk as well as tea and a variety of snacks. The ladies were

particularly happy with the encouragement given to them by Mrs. Muiruri who owns Pangani Milk

Canteen. She narrated to them how she started her milk business with only 5 litres hawking from door to door 14 years ago. She is now the proud owner of several milk bars which have enabled her to educate her children comfortably. The ladies appreciated the encouragement and promised to aim high in their camel milk businesses.

The traders promised to consider joining the Dairy Traders Association once they return to Garissa and after discussing the issue with their members. They however appreciated the spirit of working together for the benefit of their milk businesses.

During the meeting between Garissa and Nairobi milk traders at Pumwani, the Nairobi traders said they would consider selling camel milk in the near future.



Meeting between Garissa and Nairobi milk traders

On 21st Nov 2009, the Garissa traders visited the Vital Camel Milk Limited (VCML) in Nanyuki. The proprietor, Holger Marbach received the milk traders. He said VCML's trademark is the organic nature and health benefits of its milk products. VCML sources its raw camel milk from both individual producers and ranches. The producers who deliver milk to the factory gate receive Ksh 40.00 per litre while prices for milk collected from the field by VCML transport are negotiable. VCML needs as much as 5000 litres of milk per day if it is to meet its orders for both local and export markets. However, getting enough milk to service these orders is a big challenge. This is because few

producers are able to meet the high quality standards set by VCML. In addition, most camel keepers are not commercial milk producers hence have not focused on milk production as a business. The recurrent drought is another challenge as well as high transport costs since milk producers are far from the factory yet the milk volumes being collected are low. In an effort to improve the quality of raw camel milk delivered to VCML, they continually do the following:

- Train the producers on hygienic milk handling. Producers are trained not to smoke their milking containers. Any smoked milk is rejected.
- Each milk producer buys on credit two sets of stainless steel/ aluminium milking buckets and milk cans. VCML deducts Ksh 1.00 per every litre of milk delivered daily towards payment of the milk containers until they fully pay.
- VCML cleans and sterilizes the milk cans for the producers, hence the need for two sets. The producers are advised to open the sterile cans the following day at the time of filling them with milk.

Mr. Holger Marbach expressed interest in buying at least 1000 litres of high quality camel milk from Garissa if the producers can provide raw and non-smoked milk handled hygienically in the recommended containers. He also has charcoal coolers which he is willing to co-own with partners in business so as to maintain the quality of milk. His store is fully stocked with appropriate milking buckets and milk cans for selling on credit to milk producers for assured milk quality.

Highlights on exposure visit

- *Garissa traders visited two milk bars/canteens and one milk trading group in Nairobi*
- *They felt challenged and motivated to start similar milk canteens in Garissa*
- *They met representatives of Eastleigh milk traders and exchanged contacts*
- *They visited the Dairy Traders Association (DTA) office in Ngara and were hosted by the national DTA chairman*
- *The leaders promised to consider joining the DTA after consulting with their members in Garissa*
- *They visited the Vital Camel milk Limited (VCML in Nanyuki. The proprietor expressed interest in raw camel milk from Garissa.*

4. Training Recommendations and conclusions

The training assignment was conducted and concluded as scheduled. However, SITE believes there is always room for improvement as outlined below;

Training Time: some traders expressed the desire to have the training delivered for more days. In future, Care Kenya may consider allocating more training days.

Training for camel milk producers, herder and transporters: the 481 milk handlers trained comprised of both primary and secondary milk collectors. The milk producers, herders and transporters were not trained. Milk quality starts at production but must then be maintained throughout the value chain. Care Kenya may consider training for these groups in future. Similarly, only 481 primary and secondary milk collectors were trained. This is a small number because there are more than 1000 milk handlers in the 31 milk trading clusters and as many others who trade without affiliation to the clusters.

Follow-up training: the milk traders were very receptive of the training and showed genuine interest in all the topics. Care Kenya should take advantage of this interest to carry out frequent follow-ups to ensure implementation of the gained knowledge. Such follow-ups will determine any need for refresher training. SITE supplied the Care Kenya's Garissa office with one testing tool kit for easy follow up on milk testing among the traders.

Milk testing equipment: the topic on milk testing was appreciated most by the traders. Care Kenya may consider ways of ensuring lactometers are easily available to traders who want to start carrying out density tests on their milk.

TOT training: training some milk traders as trainers of trainers (TOT) would be ideal since this would ensure continuity of training in the groups. However, the literacy level of most of the trainees was a limiting factor. Care Kenya may need to come up with better structures in the milk trading groups to ensure establishment of TOT training using the literate members in the groups.

Development of training (IEC) materials: due to the low literacy level among the trainees, there was need for translation which slowed down the training process. The trainer could not be sure that his training messages were communicated as appropriately as he /she wished. The literate traders wrote notes during the training which they will be revising on their own. To supplement the training and ensure that even the illiterate traders have some reference materials to refresh

their memory, Care Kenya may consider the development of very simple fliers and posters with illustrations and pictures that communicate visually and simply on hygienic milk handling issues. ***BDS Market Approach***: the current system of training at Care Kenya relies on incentive to the milk traders for them to attend training. As a result, it is hard to determine the traders who attend with the intention to improve their businesses. Care Kenya may need to introduce a hybrid system that screens the trainees to ensure those who attend are keen to acquire knowledge for transformation of their businesses. This can be done using the tracer survey. This will help the organization to reduce the unit cost of training while benefitting the real entrepreneurs to improve their businesses based on the acquired knowledge. This is in line with the Business Development Services (BDS) Market approach.

Highlights on training recommendations

Recommendations on training

- *Increase training time as requested by some milk traders*
- *Organize training for all milk handlers for greater impact on milk quality*
- *Follow-up on the traders to ensure implementation of the acquired knowledge*
- *Assist the milk traders to access Milk testing equipment*
- *Develop structures for TOT training among the milk traders*
- *Develop training materials such as simple and illustrative posters and fliers to keep refreshing the traders memory*
- *Introduce the BDS Market Approach in future training to the milk traders*

SECTION IV

Marketing Strategy for Camel Milk

Camel milk marketing in Garissa is localized among the pastoralist community thus there is need to develop an appropriate strategy for its marketing beyond the local market. A marketing strategy is a process that allows an organization to concentrate its limited resources on the greatest opportunities to increase its market share and achieve a sustainable competitive advantage. A marketing strategy should be centered on the key concept that customer satisfaction is the main goal.

Highlights on marketing strategy**Marketing strategy for camel milk**

- *Definition of camel milk markets*
 - *Informal milk market – deals in raw milk*
 - *Formal milk market – for processed milk*
- *Identification of milk marketing challenges*
- *Exploration of potential market interventions*
- *Development of short and long term marketing strategies*
Short term strategies: training all traders, self organization, exposure visits, reorganization of milk collection and transportation & establishment of camel milk canteens
Long term strategies: phase out plastic milk containers, partner with VCML or other milk processors, start a milk processing plant in Garissa

1. Camel milk markets

The main markets for milk produced in North Eastern Kenya are two:

- The local raw milk market among the pastoralist communities in all urban centres in North Eastern Province. This accounts for the largest market share. Other urban centres where pastoralist communities' population has grown have also become reliable markets for the raw milk – notably, Nairobi's Eastleigh estate.
- Processed camel milk. This accounts for less than 1% of the camel milk market share. It is currently represented by the Vital Camel Milk Limited (VCML) in Nanyuki.

2. Current marketing challenges

The camel milk market is currently facing several marketing challenges as outlined below:

- Fluctuating milk volumes based on forage availability to camels
Garissa is an arid district which experiences drought for most of the year. Forage availability is very seasonal leading to fluctuating milk volumes that may not sustain a steady milk market.
- Unhygienic milk handling practices

The milk industry in Garissa targets local consumers and still operates in a traditional way. However, if camel milk is to get markets outside the traditional consumers, the milk producers, collectors and transporters need to be more hygienic in handling it.

- Use of inappropriate milk handling containers
The milk market in Garissa is dominated by wooden and plastic milk containers. Their use is driven by traditions and also by milk transport constraints. However both are hard to clean and sterilize.
- Long distances between the range lands and the market
Milk producers take 5 to 6 hours to deliver milk from the range lands to the primary milk collection points. The milk transporters take an average of one hour to travel from the primary milk collection points to Garissa town. Milk quality then deteriorates because a lot of time elapses since milking to consumption.
- Inappropriate milk transport
Milk transporters from the primary milk collection points to Garissa town use land rovers. The road infrastructure is very poor hence vehicles wear out quickly. Transporters are few and transport everything at the same time, including people, goats, charcoal and milk. Plastic milk containers tied on land rover sides while on transit gather dust and normally burst due to congestion.
- Unavailability of clean water
Availability of clean water is a challenge in most parts of the greater Garissa district. When it rains, rain water is harvested in water pans but is not portable. In some areas such as Dertu, a borehole has been sunk. In areas without boreholes, some NGOs are providing tanks and water at specific watering points close to Manyattas. Clean water is needed for hygiene and the production of high quality camel milk, which will be acceptable in markets even outside Garissa.
- Poor organization of Camel milk actors
The camel milk actors are very many both at the primary and secondary milk collection points. If they embrace self-organization, they will have the strength of numbers to tackle milk marketing challenges as well as lobby government departments for recognition and development of camel milk standards.
- High environmental temperatures
Environmental temperatures in Garissa range from 33° C to 42° C. These temperatures encourage faster multiplication of bacteria hence milk spoils very fast. Camel milk is indeed unique to survive for 8 hours under such temperatures.
- Lack of camel marketing systems
The camel milk industry is mainly restricted to the pastoralist communities who are the traditional consumers of camel milk. The milk is wholly marketed by the informal traders in Garissa. Marketing systems for both the formal and informal segments of the industry must be developed for commercialization. The informal segment trades in raw milk and for greater impact, this is where most marketing effort should lie in the immediate future while exploring opportunities for developing the formal milk segment as the industry grows.
- Limited milk products
Milk products present in the Garissa market today are limited to fresh camel milk and the naturally soured milk known as *Susa/lala*. This limitation in products denies the milk actors the additional market and the high profit margins associated with sale of value added products.

- Lack of government policy support
The dairy act of 1958 lays emphasis on cow milk marketing but does not recognize milk from other animals such as camels & goats. This has led to the camel milk industry lagging behind on policy issues that directly affect its marketing.
- Lack of business orientation among milk actors
The pastoralist community places a very high cultural value on the camel but has not yet exploited its economic potential. Camel milk harvesting presents an opportunity to alleviate hunger while establishing a sustainable industry.

Highlights on marketing challenges

Marketing challenges for camel milk

- Fluctuating milk volumes based on forage availability
- Unhygienic milk handling practices
- Use of inappropriate milk handling containers
- Long distances between the range lands and the market
- Inappropriate milk transport
- Unavailability of clean water
- Poor organization of milk actors
- High environmental temperatures
- Lack of milk marketing systems
- Limited milk products
- Lack of government policy support for camels
- Insufficient business orientation among milk traders

3. Potential interventions

The milk marketing challenges identified above need to be addressed if more milk of high quality is to access markets for the benefit of the pastoralist communities. The proposed interventions include:

- *Improve milk production and reduce seasonality*

Milk productivity can be improved through:

Improved husbandry practices: the pastoralists rely on their traditional knowledge and agro vets for management of their camels. Emergence of Camel Service providers on appropriate husbandry practices will improve milk productivity as a result of better health & nutrition. Simple adjustments like increasing the number of milking times from two to four will result in higher milk volumes. Change in practices such as tying up camel teats - which predisposes camels to mastitis – will lead to higher milk yields.

Better breeding: Pastoralists should be encouraged to use higher milk yielders for breeding purposes as opposed to using poor yielders. This results in a replacement stock of high yielders provided breeding bulls are sourced outside the herd.

Ranching: entrepreneurs in the pastoralist community should be encouraged to invest in commercial ranches where better management practices such as feeding would assure a steady supply of milk. Coupled with possible irrigation along the Tana River, Ranching would ensure a steady milk supply through out the year due to availability of forage trees for camels' feeding.

- *Train all milk handlers along the value chain*

Milk handlers along the value chain must be trained for high milk quality that can access markets. The quality of camel milk can only be improved significantly if handling is improved right from the source hence the need to train producers. There is also need to train more primary and secondary milk collectors since few were trained. Transporters must also be trained to eliminate incidences of milk contamination during transportation.

- *Ensure the milk handlers acquire appropriate milk handling containers*

The wooden containers used for milking as well as the plastic containers used for milk transport are hard to clean and sterilize. In addition, plastic containers lead to milk losses when they burst in transit. The milk handlers were introduced to aluminium milk cans and scoops during the training and were encouraged to save money and progressively phase out the plastic containers in preference to the aluminium cans. Using the appropriate milk containers will greatly improve camel milk quality hence easier penetration to markets and reduced losses. In the mean time, the camel milk handlers were shown and encouraged to clean their plastic containers appropriately.

- *Train milk producers and collectors to embrace farm-based milk preservation methods*

Milk handlers should be encouraged to adopt simple preservation techniques to maintain the quality of milk. These include: not mixing morning and evening milk, dipping the milk-filled containers in a *sufuria* of cold water to keep it cool. In addition, boiling milk before transportation improves its keeping quality.

- *Improve milk collection and transportation*

The current system of milk collection and transportation with other items such as charcoal, goats as well as human beings is not hygienic and needs to change to improve quality. It is also unreliable especially during the rainy season since some roads become impassable. The following needs to be done:

- Train the transporters on hygienic milk handling – this may prove very hard because the transporters are always on the move and are not dedicated to transporting milk only. However, training them as the industry grows will go a long way in influencing the way they handle camel milk thus reducing chances of contamination.
- Create compartments in the transport vehicle where milk will be kept separately avoiding contamination. Introduction of aluminium milk cans allows stacking at a corner, away from goats and charcoal. Alternatively, the milk cans may be put inside clean harnesses made of natural or synthetic gunny bags and still be tied to the sides of the land rover if traders acquire them sooner. The harnesses will cushion the aluminium milk cans against the knocking impact while on transit and will also ensure the cans are shielded against too much dust and direct sunlight.
- Emergence of milk transport trucks dedicated to milk only is very desirable. This may happen sooner if the milk collectors organize themselves and pool their resources towards acquisition of cheaper milk transport. This will eliminate the current sources of milk contamination.

- *Provide portable water to the milk handlers and train them on water harvesting*

Clean and safe water is important for hygienic milk handling to be achieved. Availability of safe clean water is a real challenge in many parts of Garissa, hence water provision in every primary milk collection point will ensure the milk producers and collectors clean their milk containers appropriately before returning to their homes. Some primary milk collection points such as Saka

and Sankuri as well as Dertu can easily have clean water provided close to the collection points once established since there is water. Those other milk collection points may need establishment of water points with collaboration with other NGOs working in Garissa. Provision of water at a milk collection point will also require establishment of a drainage system to drain away the cleaning waste water.

- *Encourage the milk handlers to organize themselves into registered groups for collective marketing*

The primary and secondary milk collectors were trading at a common collection point but all of them were doing business on an individual basis. It is only at Bura Nadhir and Kamuthe as well as in Garissa town where some groups were formally registered but were still trading individually. Organization of milk traders into registered and cohesive groups will ensure joint action for profitability in their businesses. The milk transport costs can go down significantly if they bulk and transport together as opposed to individually. Similarly, they can source competitive markets for the milk if they bulk and pasteurize it collectively. In addition, if all the milk handlers formed an organization; they can advocate and lobby government departments for recognition and inclusion of the camel industry in policy.

- *Set up milk collection centres with better facilities*

The primary milk trading points in Garissa had no formal structures with the desired facilities. Each milk collector was boiling milk in her house. Similarly, the Garissa milk shade in town did not have facilities other than a roof. In an effort to improve milk quality, establishment of collection points with basic facilities such as a roof, a cemented floor, and water troughs for cooling milk, an improved energy *jiko*, aluminium cans for heating milk indirectly, cleaning troughs, clean and safe running water and a basic drainage system will be needed. The same should be done in Garissa town.



A Milk collection centre at Kamuthe

Such facilities will ensure proper cleaning of milk containers, hygiene, and preservation of milk quality as well as pasteurization of camel milk. All these will go a long way in ensuring camel milk has access to markets due to improved quality.

- *Explore different milk marketing systems.* This can be done by setting up milk canteens, explore possibilities of milk processing in Garissa in addition to looking for markets outside Garissa.

Milk canteens for the sale of camel milk and milk products can be set up in Garissa as a way of creating more market outlets. This is because milk canteens encourage direct consumption of



A milk canteen in Nairobi

milk and milk products creating a sizeable local market.

Such canteens can also be set up in Nairobi's Eastleigh estate and other town provided they meet the set hygienic standards. The camel milk canteen should be established in line with the set minimum specifications laid down by the Kenya Dairy Board for maintenance of milk quality.

Markets outside Garissa: The milk traders rely on the local Garissa and Dadaab markets. However, they need to look for markets beyond Garissa for profitability based on sales volumes. This could be in Nairobi or other towns where there is demand for camel milk. However, the traders must be prepared to continuously supply these markets with milk throughout the year whether there is drought or not. This way, they will be assured of a reliable milk market throughout the year.

Processing: camel milk processing is another possibility for the expansion of the milk market beyond Garissa. The processed milk would target a different class of consumers who are willing to pay more for the added value of pasteurization and packaging. The processor will need to come up with the most appropriate product packaging. The most affordable packaging for milk products is the plastic pouch or bottle since both packaging materials are cheap and available locally. However, the specific material to be used between the two will depend on the equipment installed. The processed milk products should be branded and labeled as appropriate for prominence in the market. The right product branding, labeling and packaging will help in advertising, promoting and positioning the new milk products in the market. Milk prices have to be set based on all costs and the prevailing market prices of both raw milk and of competitors like VCML.

However, based on the experiences of Vital Camel Milk Limited in Nanyuki, the new milk processor may encounter challenges. A feasibility study should be conducted to ascertain the viability of the enterprise before establishing it. The likely challenges include:

Milk shortages – this lead to unmet orders and disappointed customers. They stem from seasonality of forages. Reliable sources or raw milk must be sought.

Poor quality camel milk and camel milk products – the camel milk producers in Garissa are still traditional in their production systems and training them to drop their traditions of smoking milking containers may take some time. This will mean quality of camel milk may be low hence the resultant camel milk products will be of poor quality affecting their acceptability in the market.

Ownership and operations – the ownership of a processing plant would need to be sorted out very well at inception to have a sustainable enterprise. This can be sorted out by settling to have the processing plant registered under cooperative or company act which defines clear rules of membership and operations.

Lack of business for informal traders – the milk processing factory will affect the markets of the informal traders especially in sourcing for raw camel milk pushing some out of business. This is not a very desirable result since those pushed out will loose their source of livelihood. A lot of restructuring and balancing will be necessary to reduce the severity of this problem.

- *Gauge acceptability of processed camel milk products such as yoghurt by experimenting with one organized group and then rolling out to other groups once the products are acceptable by the community*

Acceptability of value added camel milk products such as yoghurt and *lala* would mean a broader market for camel milk both locally and in other towns. It would particularly benefit milk canteen operators because such high value products have higher profit margins.

- *All camel industry stakeholders to collectively ensure the camel industry is represented in policy, standards development and allocation of resources*

The recognition of camel milk in policy will drive development of its standards and justify allocation of funds to the sector. Stakeholders in the sector are charged with the responsibility of ensuring the sector is not left out on policy issues.

*Highlights on possible marketing interventions***Milk marketing interventions**

- *Improve milk production and reduce seasonality*
- *Train all the milk handlers along the value chain*
- *Ensure the milk handlers acquire appropriate handling containers*
- *Train milk producers and collectors to embrace farm-based preservation methods*
- *Improve milk transportation*
- *Provide clean and safe water to the milk handlers at trading points*
- *Encourage the milk handlers to organize themselves into registered groups for collective marketing*
- *Set up milk collection centres with cooling water troughs and a roof to reduce the effects of high environmental temperatures*
- *Explore different milk marketing systems: set up milk canteens, milk processing in Garissa and look for markets outside Garissa*
- *Gauge acceptability of processed milk products such as yoghurt by experimenting with one organized group and later roll out to other groups*
- *All industry stakeholders to collectively ensure the camel is represented in policy, standards development and allocation of resources by government*

SECTION V

Basic equipment for safe and hygienic harvest and handling of camel milk

1. Introduction

The primary and secondary milk collectors were trained on hygienic milk handling by SITE trainers. The training covered the need to use appropriate and clean milk handling equipment for harvesting, storage and transportation of milk.

Proper cleaning of milk handling equipment will improve milk quality immediately. Acquisition of the recommended aluminium milk containers and other equipment should be an immediate future concern as the industry grows. Milk collection and transportation will have evolved to eliminate the challenges that necessitate the use of plastic and wooden containers.

Highlights on milk handling equipment

Basic milk handling equipment

Short term strategy

- proper cleaning of the plastic and wooden containers
- provision of clean safe water for cleaning purposes
- reorganization of milk collection and transportation
- acquisition of milk testing equipment e.g. lactometers

Long-term strategy

- Acquisition of appropriate milk handling containers for better milk quality as the industry grows
- Acquisition of appropriate technology & equipment for use in soon to emerge milk canteens

The equipment in the Garissa milk industry today, its associated challenges as well as the recommended equipment, possible sources and current prices is tabulated below;

Camel milk handling equipment and tools

No.	Stage in the milk value chain	Current Equipment	Challenges of the current equipment	Recommended Equipment	Sources of equipment	Current price (Ksh)
i	Milking	Wooden container/cup	Hard to clean & sterilize	Aluminium milking bucket - 5 litres	Ashut Eng Ltd, Kaluworks Ltd, Kengrow Ltd	1,500
				Aluminium or S/steel sufuria	General merchants	500
ii	Storage	Wooden gourd	Hard to clean & sterilize	Aluminium milk can – 10lts	Ashut Eng Ltd, Kaluworks Ltd, Kengrow Ltd	1,292 - 2100

iii	Transportation	Plastic containers	Hard to clean & sterilize Not durable	Aluminium or s/steel milk can	Ashut Eng Ltd, Kaluworks Ltd, Kengrow Ltd	1,292 - 2100
iv	Milk Testing equipment	Mouth (for tasting)	Risk of diseases	Milk testing toolkit	Monks Laboratories	10,000
v	Heat treatment	-Three-stoned fire place, Sufurias -Plastic containers	-Heat loss -Delayed heating -Bursting	Energy jiko	Artisans	35,000
				Aluminium can- 25 lts, 50 lts	See above	4500 - 6500
				Metal sleeve	Jua kali	3,500
vi	Milk Measuring equipment	Plastic jugs Plastic cups	-Hard to clean -Contamination	Aluminium milk scoops/pints	Ashut Eng Ltd	700

i. Milking Equipment

The pastoralist communities regard camel milk as a very valuable food with both nutritional and acclaimed therapeutic properties. The milk is therefore harvested and stored using traditional wooden containers and gourds, which have been previously smoked with a firebrand of a special herb. This special herb gives the milk a special flavour and also preserves it.

The wooden milking containers are also valued by the pastoral community as part of their cultural heritage. They are crafted from locally available trees by gifted craftsmen in the community.

Milk producers close to town like in Raya trading point are using plastic milking buckets instead of wooden ones. They said the plastic containers are easier to clean and keep the milk for long compared to the wooden ones. However, the milk producers realized that if the lid of the plastic bucket is firmly put in place during milk storage; the milk gets spoilt because the plastic container insulates all the heat causing milk fermentation.

Aluminium/stainless steel milking buckets are easy to clean and sterilize and would be most appropriate to replace the wooden containers for better milk quality. They are available locally and also imports from India. Their cost may be out of reach for immediate purchase by the milk producers and collectors but they can save money over time and buy them. However, as they save towards buying them, they may consider the use of soot less aluminium sufurias for milking since they are widely available in the local market and are easy to clean and sterilize. Cleaning the milk containers properly without smoking them will immediately result in high quality milk acceptable to other communities.



Wooden milking container



S/steel aluminium bucket

The pastoralist communities use wooden gourds for storage of camel milk. Their inner surfaces are not very smooth therefore they retain milk residues after cleaning which shortens the keeping quality of the milk stored in them. They are however ideal for fermentation and storage of fermented milk.



Wooden milk containers

Aluminium milk containers would be the best for the storage of camel milk since they are easy to clean and sterilize. It is also easy to cool milk stored in them by dipping the cans in clean cold water.

Aluminium or stainless steel sufurias with lids can also be used for storing milk since they are easy to clean, sterilize and are locally available. Proper cleaning of the gourds will immediately improve the quality of milk before acquisition of the aluminium containers.

iii. Equipment of milk transport

Milk transport in Garissa is currently dominated by plastic containers of various sizes ranging from 5 liters to 20 litres. They are widely available from the local Garissa market and are mostly ex-cooking oil plastic containers. They are preferred by the transporters because they are easily tied onto the milk transport vehicles. They typically have a hole on their lid and a string through it as a way of securing the lid.



A plastic milk container

Aluminium/stainless steel milk transport cans would be the recommended transport containers to replace the plastic ones if there was no challenge in transportation and temperatures. This is because they are easy to clean, sanitize, are durable and unlike the plastic milk containers, they are good heat conductors hence can allow for easy heating and cooling of milk in them. However, due to the mode of milk transport being used currently, it would be necessary to have harnesses for the aluminium milk cans - in form of baskets made out of natural or artificial gunny bag material. The harnesses will allow for the tying of the milk onto the transport vehicle and will also cushion the milk cans against knock-impact during transit.



Aluminium milk cans and scoop

The harnesses would shield the milk against dust. In addition, wetting the milk harnesses just before milk transit will also allow for evaporative cooling of the milk thus lengthening its shelf life. The camel milk handlers were introduced to these aluminium cans during the training on hygienic milk handling. The cans are available in many sizes ranging from 5 litres, 10, 15 upto 50 litres from several manufacturers' in Nairobi's Industrial area as well as imports from India.

Kaluworks limited also manufacturers the *Pardini* aluminium milk cans which have gaskets in their lockable lids making them leak-proof. Ashut Engineering limited is manufacturers of milk cans as well as milk scoops/pints and own the *DATINI* trademark.

Milk handlers should clean their current plastic milk containers appropriately as an immediate solution to improved milk quality. A long term solution would be to acquire aluminium milk cans with the reorganization of the sector in regard to milk collection and transportation.

iv. Milk Testing Equipment

The milk producers and collectors in Garissa perform sensory tests on milk before buying. They normally taste the raw camel milk using the lids of the milk containers to determine its freshness.



Milk testing equipment

Tasting and even consuming raw camel milk by the producers and collectors was discouraged during the training because of the inherent danger of infection with diseases such as Brucellosis and Typhoid. The camel milk handlers were also trained on basic milk testing techniques such the simple clot-on-boiling test by boiling a small amount of camel milk in a spoon over a flame to determine the freshness of the milk instead of tasting. They were also shown how to perform the density test using a lactometer so as to detect milk adulterated with water.

v. Milk Pasteurization Equipment

The primary milk collectors at Kamuthe shared how they use the milk-filled plastic milk containers to boil milk indirectly by dipping them in a sufuria of boiling water over a simple fire place. They shared how this method takes long to heat and cool the milk and this leads to bursting of the milk containers while on transit if it is transported hot. There is simple equipment which is more efficient and the camel milk handlers can use it to heat-treat camel milk indirectly and later cool it sufficiently thereby eliminating incidences of the plastic container bursting while in transit. This equipment will also be necessary once the Garissa milk traders establish milk canteens. This equipment includes:

- *Improved energy saving jikos*

The energy saving jikos are ideal for milk pasteurization since they do not waste heat energy to the environment but instead concentrate all heat energy to the milk being pasteurized. They are constructed in a special way with clay bricks, charcoal dust, sand and fireproof cement to ensure that the *jikos* are insulated against heat loss. There are many *jua kali* artisans capable of fabricating these jikos.



The improved energy saving jiko



Milk being cooled in half drums



Milk being pasteurized on the jiko

- *Aluminium/stainless steel milk cans* for camel milk pasteurization
The energy saving jiko is designed with burners of various diameters suited to the desired size of sufuria or metallic pasteurization sleeves. Aluminium milk cans are filled with the milk to be pasteurized and enable efficient heat transfer during pasteurization. The size of the aluminium can to be used will depend on the milk volumes being pasteurized. Their capacities range from 5 litres to 50 litres.
- *Metallic milk pasteurization sleeves*
The metallic pasteurization sleeves are shaped like a deep and narrow sufuria. They are made to suit the given aluminium milk containing cans. They are also made to sit and cover the jiko burner completely for efficient heat transfer. They are used for indirect heating of milk in the aluminium milk cans. They make milk pasteurization very efficient whereby 3 litres of hot water in the metallic sleeve efficiently aids in pasteurizing 50 litres of milk through indirect heating in a space of 45 minutes.



Metallic pasteurization sleeves

vi. Milk measuring equipment

The secondary milk collectors use plastic jugs, plastic cups and even bottles to measure out the desired milk volumes to consumers. However, these containers are hard to clean and increase chances of milk contamination. To eliminate this, it is recommended that they use *Aluminium scoops/ pints* to measure out milk and replace the plastic jugs as the sector grows.

These milk scoops have a long handle ensuring that the seller does not contaminate milk while measuring it out to customers. They have a long hooked handle which allows measurement of milk from the deep milk cans. The hook allows its suspension in the milk can after every measurement eliminating chances of contamination. In the mean time, the milk traders may use light coloured jugs since they show dirt easily. They should maintain their cleanliness by covering them against flies and dust to eliminate incidences of milk contamination.

SECTION VI

A. Conclusions and Recommendations

The potential of the camel milk industry is enormous but will only be realized if there is strategic reorganization of its operations for commercialization. The reorganization must focus on development of milk marketing systems. Improvement of milk production and attainment of desirable milk quality through training of all milk handlers in the chain as well as restructuring milk collection and transportation is critical to commercialization. These efforts cannot be done piecemeal but must focus on the entire milk value chain targeting both the formal and informal segments of the industry which are equally critical to commercialization.

However, for greater impact on the milk industry, more focus should be put in reorganizing the informal segment for greater impact since it is the one handling over 99% of all marketed camel milk. In the long term, strategies must be put in place in pursuit of a viable formal camel milk segment after clearly establishing supply and demand constraints as well as appropriate interventions. This calls for a feasibility study before venturing into the formal milk market.

It is evident that the government, through the Ministry of Livestock and Fisheries Development is committed to the development of the camel milk industry. It is hoped that this support through policy development will translate into resource allocation and standards development which are very critical in driving the industry forward by enabling market access and regulation.

SECTION VII

*Annex I***Pre-training visits to Garissa under the ELMT project****1. Background**

Care Kenya has shared a lot of information and documents with SITE on the camel milk industry in Garissa and the neighbouring districts. As part of implementation, SITE appreciated the need to visit Garissa before the actual training to see the situation on the ground and also familiarize with the Garissa CK team who will be our host during the training.

2. Introduction

The verification visits were carried out for three days: 12th, 13th and 14th October 2009.

The Garissa office organized for our travel from Nairobi to Garissa. We were picked by their driver Aden on 11th Oct to our hotel in Garissa. Their livelihoods officer, Harun, scheduled our first meeting for 12th Oct at 9.00 am in their offices. In the meeting, we drew up the schedule of activities for the next 3 days. The team comprised of Harun, Stella, Muhammad and Isaack.

3. Objective of the pre-training visits

1. To meet and familiarize with the Garissa Care Kenya team
2. To verify what has been read from the documents shared by Care Kenya about the Camel sub-sector in Garissa
3. To gather information that will help adapt the curriculum and training content by way of discussion with the milk handlers and through observations.
4. To carry out needs assessment especially on the equipment and structures.
5. To agree and finalize on training logistics

6. Findings and Discussions

The Enhanced Livelihoods in the Mandera Triangle project is an initiative of six partners funded by USAID. These partners are:

1. Care Kenya
2. Care Somalia
3. Care Ethiopia
4. VSF Suisse
5. Save the Children UK
6. Save the Children US

i) Care Kenya – Garissa office

The Care Kenya Garissa office has participated in the training of camel milk handlers on hygienic milk handling. Eight groups with a total membership of 197 camel milk handlers have been trained on hygienic milk handling and therefore are not being targeted in the forthcoming training. After the training, these camel milk handlers now boil the milk indirectly in a hot water bath instead of direct boiling thus avoiding the burnt flavour. According to the Garissa team, there is very little value addition done on camel milk in Garissa other than boiling the milk and the spontaneously fermented camel milk called *Susa*. Stella shared with us from her experience how practical the training should be focusing on very basic things as washing hands while

handling milk and observing basic hygienic practices such as avoiding spitting and blowing the nose while handling milk.

ii) **VSF Suisse** (Veterinarians without borders)

This organization has veterinarians who offer veterinary services and also train pastoralists on hygienic milk handling and market issues. We did not meet them during our visit but the Fafi DLPO shared with us some insights into what they are currently doing in parts of North Eastern Province.

Currently, they are involved in destocking in Garissa and neighbouring districts in partnership with the Ministry of Livestock.

Other stakeholders in the camel industry

iii) **Ministry of Livestock and Fisheries Development – Garissa**

We were received by Irene Koki who was the acting DLPO in the absence of both the DLPO and his deputy. She explained she was a new staff in the Garissa office and therefore opted to invite the Fafi DLPO to the meeting. The Fafi DLPO had served at Garissa for many years and was in Garissa for the Public Service week. He shared the following insights with us:

1. There are more than five camel milk routes from both Garissa and Athi River that feed Garissa town with camel milk daily from the range lands. The average daily volume of camel milk traded is 80,000 litres.
2. Land rovers are involved in the transportation of camel milk from the primary collection centres to Garissa town. These land rovers transport many items at the same time: goats, charcoal and milk as well as people. He agreed this was unhygienic and there is need to change this with time.
3. Camel milk producers and transporters have never been trained on hygienic milk handling but some camel milk collectors have been trained. According to him, even those trained need more training and other facilitation such as appropriate milk collection points for the training to have impact.
4. A mini dairy for camel milk processing has been registered but nothing has been done on the ground. Funding is needed for its set up and operations to begin.
5. To further improve the quality of camel milk, the DLPO shared the following insights:
 - there is need to provide clean water to the camel milk handlers for improved milk hygiene
 - there is need to improve milk handling containers from plastics to aluminium cans
 - there is need to have milk collection points at two points: near Garissa Primary and secondary schools as well as renovate the milk collection shed constructed by the First Community Bank for women camel milk trading groups in Garissa town. The renovation should involve cementing it and providing piped water and a cleaning point for their containers and connect this to the drainage.
 - there is need to improve milk transportation in many ways: through training the transporters, compartmentalizing the transport land rovers as well as having trucks dedicated to milk transportation only as the camel milk industry grows.

iv) **Millennium Development Goals Centre (MDG Centre)**

We were received by Mr. Idris, who is the Agricultural Centre Coordinator for MDG Centre in Garissa. The MDG Centre mapped the camel milk routes as they are in both Garissa and parts of Athi River. He explained that the MDG Centre is a Research and Development Centre but is currently involved in “Emergency Response” due to the severe drought in Garissa. These emergency response activities include: provision of water tanks and water in strategic points in the ranges for livestock watering and human use, provision of hay to livestock, provision of drugs and health services to both humans and livestock. The MDG has also sunk a borehole in the Dertu Millenium Research Village in Dertu town where many pastoralists converge to water their livestock. The water troughs were also constructed by the MDG Centre.

He shared the following insights:

- He felt the timing of the training was not right because of the current drought which has rendered many routes inactive for lack of milk to trade in. He felt the training will only have impact if done along the Tana River where camel milk production and trading is still ongoing inspite of the drought.
- He was concerned Care Kenya was proceeding with training without involving other stakeholders such as the MDG Centre, SNV and the livestock office in Garissa.
- He clarified that the two main markets for camel milk produced in the larger Garissa was Garissa town, its urban centres and the Dadaab refugee camp.

v) The Public Health office, Garissa

The Public Health Officer for Garissa was impressed with the initiative of training camel milk traders on hygienic milk handling. He shared with us his public health concerns:

- Inappropriate milk handling containers – most traders use plastics which are very hard to clean especially at the hollow handle where milk deposits accumulate.
- Cultural practices – the pastoralist communities occasionally drink fresh camel milk without boiling it saying it is more beneficial. This poses a public health concern with possibilities of disease such as brucellosis.
- Pooling different batches of milk which are from different sources – The multiple camel milk handling leads to contamination and subsequent spoilage of camel milk
- Long distances from the range lands to Garissa town leads to quality deterioration and contamination from dust and other items carried along with the milk.
- Milk filled containers hang precariously on the roof and sides of the transport land rovers and due to the pressure of hot milk, they occasionally burst scalding passengers carried in the same vehicle.
- Multiple uses of camel milk handling containers - he reported a case where 11 people were hospitalized with acaricide poisoning after milking was done in a container used for acaricide dilution.
- Due to the current drought and subsequent milk shortage, mothers sell most of the milk leaving little for the children yet it is the most important protein source in the arid areas to guarantee children’s health.
- According to him, the following diseases of public health concern are common in Garissa:
 - Brucellosis
 - Typhoid
 - Tuberculosis

- Diarrhoea – the PHO said this could be attributed to the laxative effect associated with camel milk as well as the unhygienic manner in which the camel milk is handled.

7. Observations and recommendations

The impending training sessions may not have much impact if systems are not put in place to support the newly acquired knowledge. These include:

Water provision – for hygiene in milk handling to be achieved, water is very important. Availability of clean and safe water is a big challenge in Garissa as we witnessed in our visit. Since it may be very hard to have clean water in every homestead, water provision in every primary milk collection point will go along way in ensuring the camel milk handlers are able to clean their milk containers appropriately before returning to the range lands.

Milk containers – the wooden containers used for milking as well as the plastic containers used for milk transport are hard to clean and lead to milk losses when they burst. During the training, the camel milk handlers will be encouraged to adopt the appropriate cleaning procedure and to progressively phase out the plastic containers in preference to the aluminium cans. It will therefore be important to have samples of aluminium milk cans to show to the trainees during training sessions.

Milk collection points – in the visited milk collection points, each camel milk collector was boiling milk in the open in front of his/her house. There was no collective boiling and trading point for all the handlers. In an effort to improve milk handling hygiene, establishment of milk collection points with some basic facilities such as a roof, clean running water and a basic drainage system will be needed.

Milk transport – the current system of transporting camel milk along with other items such as charcoal, goats as well as human beings is not hygienic and the following needs to be done:

- vii. Train the transporters on hygienic milk handling – this may prove very hard because the transporters are always on the move but whoever will be available will be invited to the training as a starting point.
- viii. Create compartments in the land rover where milk will be kept separately instead of hanging loosely on the roof or on the sides where it gathers a lot of dust and poses a threat to the passengers below if it bursts. With the introduction of aluminium milk cans, the cans can be stacked at on their own away from goats and charcoal.
- ix. There is need to come up with milk transport trucks dedicated to the transport of camel milk only. This will happen when the camel milk market grows significantly thereby influencing more camel milk production and the emergence of transporters dedicated to camel milk only.

8. Training logistics

The training logistics for the camel milk groups were discussed as follows between the Garissa team and the SITE team:

Camel milk handlers

The actual training is scheduled to take place from 26th October to 6th November 2009. Care Kenya Garissa team along with the assistant DLPO at Garissa have already targeted 8 camel milk trading groups with a total of 237 camel milk collectors along the 5 camel milk routes in

Garissa for the training. There are also many secondary camel milk collectors who trade at the First Community Bank milk collection shed in Garissa town but these were not targeted along with the 237 collectors earlier mentioned. They comprise 31 camel milk trading groups numbering over 1000 actors. The Garissa team was not in a position to make a final decision on the possible training of these actors but they promised to discuss it with their program Manager, Mr. Hajj.

Actual training

Each camel milk group will be trained for 3 half-day sessions. The training will happen in the afternoon after trading activities and the training will be as interactive as possible to keep the milk actors interested throughout the training sessions.

Three training routes were identified as follows:

Training route I: Raya – Sankuri – Saka

Training route II: Dertu – Shimbirey – Dujis

Training route III: Hagar bull – Fafi

Training route I is a continuous route from one primary milk collection point to the next but there is no connection in the training points for both route II and III.

We were in agreement that three trainers will be sufficient to train the targeted milk handlers in the given 10 days in the 8 primary collection points. The three trainers will be assisted by the three Garissa Care staff who will serve as the translators.

Training materials

The Garissa office committed itself to provide the needed stationery for the training. They suggested that the other needed milk testing reagents and equipment as well as samples of milk handling equipment should be provided by Care Kenya Nairobi office.

Accommodation for SITE trainers

The Garissa team suggested that the SITE trainers live close to the communities they are training, instead of staying in Garissa town due to the long distances between the training points from Garissa town.

9. Conclusion

The gathered information and insight will inform the adaptation of the training curriculum as well as the training content.

Movement and accommodation during the training will be localized based on the discussions we had with the Garissa team and appreciation of the long distances between camel milk collection points and Garissa town.

The women collectors trading at the First Community Bank in Garissa town are many and handle large volumes of camel milk. SITE feels training these women will have a very big impact in improving the quality of camel milk sold in Garissa and other markets such as Dadaab and Eastleigh. We hope Care Kenya is able to include these women in the forthcoming training. These women also have an umbrella body, linking all the 31 groups trading in the shed and this could be the starting point in linking them to the Dairy Traders Association. Due to the prevailing conditions, the number of camel milk handlers met was small to inform SITE on how the camel milk handlers feel about self-organization. This information as well as verification of milk prices and the milk collectors' contributions on camel milk market development strategies will be gathered during the actual training.

Annex III

END OF TRAINING EVALUATION QUESTIONNAIRE

Location: _____

Module: _____

1. How do you rate the trainer's presentation methods?
1) Very good 2) good 3) fair 4) poor

2. Was the time allocated for the training enough?
1) Yes 2) No

If no, please give reasons;

3. Suggest areas that you think are important but were not covered under this training

4. Was the training relevant to you and your came milk business?

1) Yes 2) No.

Please comment;

5. What part of the training did you find most useful and why?

6. How are you intending to apply what you have learnt in this training?

7. Other comments

