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The Dairy Feed Advancing Model – a Value Chain Innovation in the Ethiopian Dairy Sector

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Background

The Dairy Feed Advancing model is an innovative dairy input and service provision model. It has been implemented since 2015 in an area North of Addis Abeba, the capital of Ethiopia. The model is implemented by a public-private partnership between IFDC 2Scale project, three private companies, government offices, and dairy farmers. Its purpose was to increase milk production and income of dairy farmers through supply of quality dairy feed and guaranteed offtake of milk. The increase of collected milk benefits the dairy farmers by increasing dairy income, the milk processors by alleviating milk supply shortages and quality issues, and the feed producer by developing a new market for dairy feed.

The Dairy Feed Advancing model focuses on farmers in Debre Berhan area (organized in five primary dairy cooperatives) and Selale area (grouped by private collection point). These areas are part of the foremost milkshed in Ethiopia that spreads across the North Shoa zones of Amhara and Oromia regions. In these high-potential dairy areas, large numbers of improved dairy cows are present as a result of ongoing dairy development activities over the past decades. While many smallholder farmers now have genetically improved cows (mostly crossbreds), their lack of quality feed and fodder keeps milk productivity low. Access to quality feed at an affordable price is a serious constraint for these dairy farmers. It impedes farm productivity as well as improvement of the entire sector. At the same time, milk processors are operating far below their operating capacity due to low and variable supply of raw milk, and feed processors are constrained by lack of market for concentrate feed.

Feed supplier AKF and IFDC 2Scale project initiated and coordinated the model. It was implemented in close collaboration with the milk processors Family Milk and Etete, cooperatives and farmers supplying raw milk to these processors, and the Cooperative Promotion Agency and Livestock and Fishery Resource offices as public agencies interested in supporting such initiatives.

This practice brief describes the findings of a study that reviewed the effectiveness and scalability of the Dairy Feed Advancing (DFA) model. It specifically aimed to assess i) whether the DFA model indeed makes good quality feed available to the farmers supplying to Family Milk and Etete; ii) whether it has contributed to an increase in milk production by farmers and milk supply to processors; and iii) to what extent it increases the AKF client base among smallholder dairy farmers. The results show that both dairy farmers and companies appreciated the approach: the model got high acceptance, is appropriate and inclusive. All actors appreciated the intervention as a novel and typical win-win model. Nevertheless, some points were identified as limiting implementation of the model: ineffective regulatory framework for the dairy sector and weak communication mechanisms within the dairy sector. These need to be addressed in order to convince both partners and competitors to wholeheartedly scale the model.

Key messages

Dairy farmers with improved dairy cows, using the quality feed distributed by the two milk processors, highly benefited from the dairy feed advancing model. Daily milk yields increased by 3–6 litres per cow per day. This increment in milk yield contributed to increased household income, and betterment of economic and social well-being of dairy farmers. Next to improved access to feed, farmers received a number of pertinent trainings that enhance knowledge and skills to improve their day-to-day dairy farming and related farm (business) operations.

The two milk processors increased daily milk intake from 5,000 litres to 16,000 and 13,000 litre respectively.

The model benefited the feed processor by creating new market opportunities and promoting various feeds to dairy farmers across the intervention areas.

Scalability of this model can be considered high. Factors that limit the scalability of the model are, among others, lack of price incentive for both milk processors and dairy farmers, competition with feed retailors with wide networks who distribute low quality dairy feed against low prices, and lack of implementation of a conducive policy framework in the dairy sector, e.g. to regulate quality of both feed and milk.

The Dairy Feed Advancing Model

The DFA model started in 2015 with Alema Koudijs Feed Plc (AKF) and MB Plc (Family Milk). The pilot lasted throughout 2016 and 2017. Etete Milk Processing S.C. (Etete) joined early 2017. AKF supplies concentrate feed to the dairy processors, who further distribute it to their suppliers and reconcile costs through milk payments. The model aims to enable farmers to increase their milk production and productivity by using quality feed at an affordable price. The model consists of a number of elements that reinforce each other:

a. **Supply quality feed**—AKF distributes feed to the suppliers of Family Milk and Etete. Milk collection centres are used as feed dispatching centres. AKF offers three different types of concentrate feed (*Basic, Excellent and Super*), tailored to the genetic makeup of cows. Farmers order feed from AKF through the processor.

b. **Pre-financing and introduction price**—Farmers do not pay cash: cost of delivered feed is subtracted from the regular two-weekly milk payment by Family Milk and Etete, who pay AKF monthly. To promote feed use, farmers received a temporary discount to buy down perceived risks. This discount, financed by 2SCALE and AKF, started with 35% of the regular feed price and was gradually reduced to zero over a year's time.

c. **Training farmers and farmer organizations**—To raise farmers' skills to improve milk productivity, farmers are trained by project partner staff on key dairy farming topics—cow husbandry, animal health, milk handling and quality, forage production and dairy business. Government extension officers offer advice on milk handling and quality, AKF staff provides training on cow husbandry and IFDC staff provides training on forage production. Managers of cooperatives are trained on cooperative management and key dairy farming topics by IFDC staff.

d. **Guarantee milk offtake**—The processors guarantee to collect all quality milk from their suppliers. The raw milk collection systems of the two processors differ slightly and so does the feed distribution. Family Milk collects milk in Selale area through thirty private milk collection points, manned by supervisors who are employed by the company. Etete collects milk in Debre Berhan area through five primary dairy cooperatives. The milk collection point supervisors and cooperatives coordinate the feed distribution to dairy farmers, raw milk collection from farmers and milk delivery to processors.

e. **Material support**—Family Milk and Etete provide 10-litre aluminium milk cans to their suppliers, as well as improved fodder seeds (including oats, vetch and fodder beet).

"The dairy feed supplied by the milk processor has a high quality, with different inputs that are important for nutrition of dairy cows, milk productivity and milk quality. When we feed this concentrate feed to our cows, their body condition improves, the odour of milk is very good, lactose is high and milk productivity increases. The dairy cows even do not want to adopt other animal feed once started on the concentrate feed supplied by the processor"
(FGD with DFA participant farmers)

Review methodology

The review of the DFA model was carried out between June and August 2018. To assess the effectiveness and scalability of the model, it collected and analysed information from key informants and farmers, using the following tools:

a. A household survey with 105 households randomly selected from the master list of two primary dairy cooperatives in Debre Berhan area (Debre Berhan and Basona Worena district) and from two private milk collection points in Selale area (Degem and Kuyu clusters);
b. Focus group discussions with farmers participating (4 groups) and not participating in the model (3 groups);
c. Key informant interviews with twelve partners and district government agencies participating in the model;
d. Site visits and observations of dairy farmers supplying raw milk, collectors doing quality tests and handing over milk to processors;
e. Case studies with four beneficiary farmers focusing on process and benefits from the intervention;
f. A scaling scan[1] in which the key partners reviewed ten "ingredients" of scaling;
g. A desk review of secondary data to prepare, enrich and complement the field assessment.

The results of this review are presented in this brief according to the ten scaling scan ingredients.

[1] *https://ppplab.org/2018/11/3223/*

Two milk collection systems

Milk collection by Etete in Debre Berhan area is organized differently from that by Family Milk in Selale area.

In Debre Berhan, milk is collected by primary dairy cooperatives, who then sell to Etete. The cooperatives were established with the objective to market members' milk, usually by supplying it to milk processors. They are registered, certified legal entities with buildings where milk is collected and documents and materials are kept. They are playing a vital role in members' economic and social betterment. Cooperatives are able to support members when they face marketing issues, e.g. when a processor suddenly quits collecting. Many cooperatives have received support from development projects, such as chilling and milk processing equipment, that enables them to collect and process milk from members and sell milk and dairy products when needed.

In Selale area, Family Milk collects from simple collection points. Persons assigned by Family Milk as collection point supervisors are residents of the area, trusted and respected by the community. The challenge here is that milk is collected on the roadside, without shelter. Farmers can withdraw anytime. They expressed to have no interest in being organized in formal cooperatives.

As Family Milk joined the model in 2015 and Etete only in 2017 and as Etete encountered considerable challenges, it is hard to draw clear conclusions about the advantages and dis-advantages of the two models.

Dairy farmers in Debre Berhan area transporting fresh milk by donkeys

Findings on ten scaling ingredients

The radar chart on the next page displays the scores for the ten scaling scan ingredients. Results from farmer surveys and interviews are included in the descriptions.

1. Technology practice — Score 4.4 (out of 5)

All stakeholders agreed that the DFA model does just what it was intended to do and what is needed in the context: Provide high quality feed at a reasonable price in a context where availability and price/quality ratio of feed often is inadequate. It enables farmers to increase herd productivity and dairy income. Interviewed farmers considered the model to be very relevant to their needs and compatible with the local circumstances. They were reasonably well convinced that the model is better than other ways of distributing feed and that it can be easily adapted to different situations, but also recognized the dependable supply by established brokers. An area that the model does not address is that of on-farm cooling of evening milk, which becomes more critical when production volumes increase.

2. Awareness and demand — Score 4.0

Involved companies were well aware of the model (although convincing new directors of partner companies about the usefulness of the model can be hard). Farmers, cooperatives and public agencies had to be actively informed through meetings, training and field days. Participating farmers understood the model well. Their major reasons for participating in the model were the need to get quality feed (57%) and to get it at fair cost (37%). Minor reasons included processor' performance, access to credit, better milk market and capacity building (together 5%). Participation in the model was open and inclusive to all dairy farmers who have interest and could afford to cover the feed cost. No barrier of entry or any form of exclusion (economic, non-economic, gender, age, disability, etc.) has been identified. During the FGD held with them, non-participating farmers also asserted that participation in the model was open, free and fair.

3. Business case — Score 4.3

Data show strengthened business cases for all partners in the DFA model. These add up to a positive business case for the model:

Feed processor—AKF was able to successfully grow its dairy feed customer base with circa 500 smallholders buying 50 tonnes per month. Distribution through processors simplifies delivery, but also makes feed supply dependent on performance of the same processors. The major bottleneck experienced recently was the limited processing capacity of AKF factories due to delays in new factories coming online, in the absence of other feed processors in the same quality bracket.

Milk prices, volumes and quality

Data on milk supply before and after model implementation show significant growth of average household milk sales, by 34% in Selale and by 36% in Debre Berhan. FGDs pointed out that the model played a significant role in these increments. Most of the dairy farmers asserted that their milk yield increased by 3–6 litres/cow/day on average after start of the model (from average of six litres). Both milk quantity and constitution (fat content) improved, with lactometer readings increasing from 25% (before the model) to 30% (after the model). These results corroborated an IFDC report stating that milk yields increased with 3 to 7 litres/cow/day and milk fat content increased with 0.7 percent point, and milk supplied to the milk processors increased by 40%.

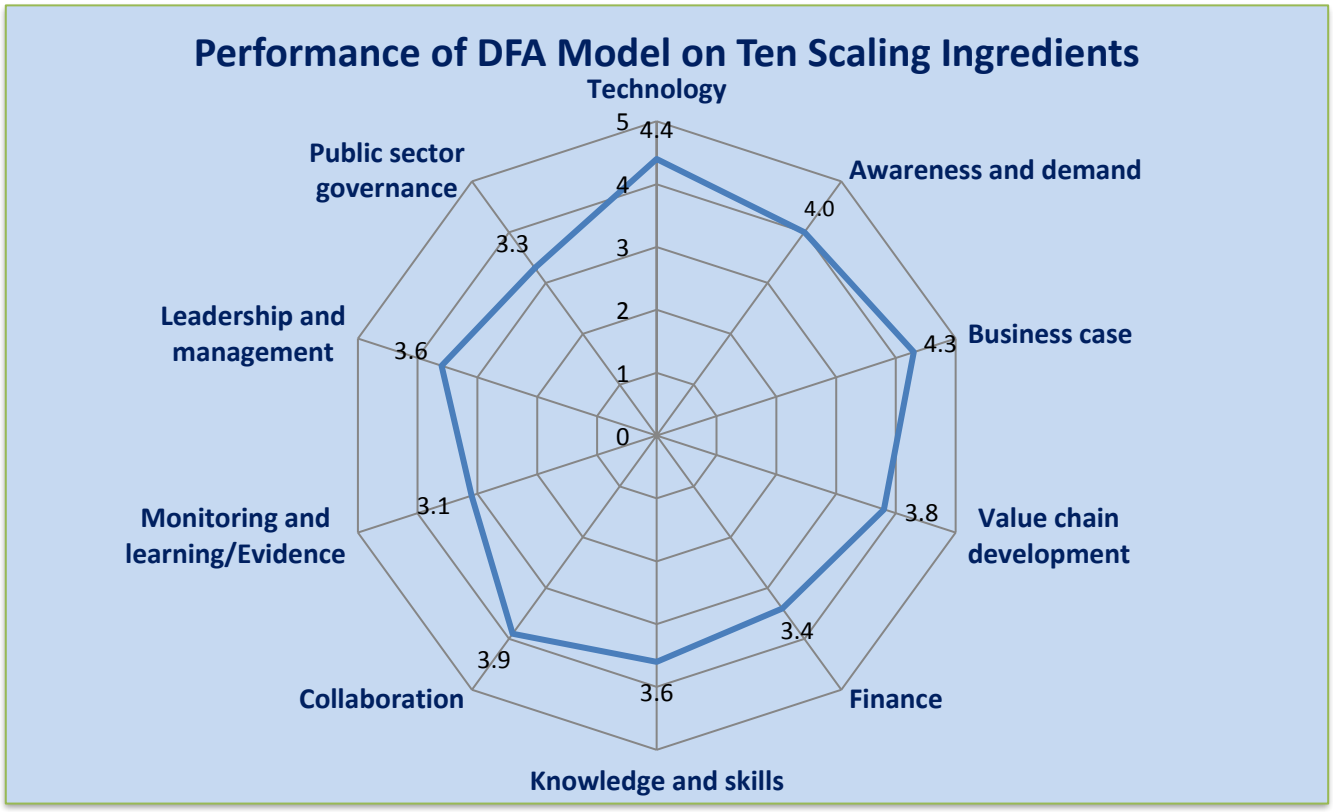
Feed prices – willingness to pay

Asked about the price they are willing to pay for feed, farmers mentioned an average of 699 ETB/quintal (212 Euro/tonne) in Debre Berhan area and 805 ETB/quintal (244 Euro/tonne) in Selale area. The latter is just over the amount model participants have to pay, but below the cost of AKF feed at the local agent.

Farmers—The model has been set up in a context were shrinking farm sizes lead to rising feed prices and intensified land use. Farmers need to purchase more input, sell more output and change their farming practices. Stagnant milk prices put farmers' margins under stress. While Family Milk was able to increase its supplier base in 2015-16 by raising milk prices, farmers now complained about its low prices compared to competitors. However, net result of guaranteed offtake is supply loyalty. Increased incomes lead to improved livelihood and wealth. Farmers built better houses, kept more cows, bought household utensils such as TVs and sofa's, could afford to dress in better cloths and could send their children to school. Their social standing in the community improved as they were able to support other community members.

Cooperatives—The cooperatives in Debre Berhan area benefited from the model through increased membership and turnover. For example, Genet Primary Dairy Cooperative, established in 1993 EC (2000 IC) with 25 members. Membership increased from 120 at the end of 2016 to 180 in July 2018 (50% increase in 18 months). 24 of them were women. Genet nearly tripled its milk intake from 600 to 1,700 litres/day after joining the model (from 5 to 9 litres/member). Income of cooperatives is directly related to milk volumes and they need a minimum volume to break even. As a result of higher turnover, their capacity to support their members on socio–economic aspects improved.

Milk processors—The model has impacted milk processors by an increase in milk collected. For instance, Etete Milk currently collects 13,000 litres of milk. Previously it often faced difficulties to collect even 6,000. Gaps in collection routines lead to temporary loss of suppliers. For example, when one processor was unable to collect milk, a cooperative shifted supply to another processor, while a large number of members of another cooperative shifted to traders in their area.



4. Value chain development — Score 3.8

The DFA model attempts to coordinate the value chain in a way that is novel for Ethiopia. To a large extent the actors where able to do so by good collaboration. The focus group discussions and key informant interviews confirmed that the model has impacted positively on the access to markets for fresh milk and quality feed. The services required for good functioning of the model—training, advice and finance—are available to farmers. The business relations between the various actors in the chain are adequately developed.

Respondents consider the market environment to be rather conducive for the dairy value chain to grow. Principal context challenges that partners encountered include: issues of double taxation on inputs for dairy feed processing and adulteration of milk with water and salt.

The importance of breed

An important point to be considered is that this model may not be attractive to farmers without genetically improved dairy cows (at least crossbred). Interviewed farmers owned an average of 2.3 improved dairy cows vs. 1.3 local breed cows (highest proportion in Selale at 2.6 vs. 1.0). This is a high proportion for Ethiopian circumstances and underlines the need for better feeding to realize the genetic potential of these dairy cows (van der Lee found that farmers will only invest in better feed if it result in milk production of over 9 litres/day (unpublished data)). The feed used – AKF Excellent brand for improved dairy cows – ensures a significant increase of production if fed consistently. On the other hand, when this feed was not available and cows had to adjust to industrial by-products, immediate yield losses were significant (–3–5litres/day). The percentage of improved cows and dependable supply will be important factors in scaling to other areas.

The lack of other feed processing plants that produce a quality product comparable to AKF concentrate feed does limit the choices for dairy farmers. Currently, AKF contracted some agents in Fitche town to retail concentrate feed. According to farmers, this is sold against much higher prices as compared to the distribution price they pay to Family Milk. Nevertheless, this channel provides more farmers access to quality feed and could act as backup channel for the DFA farmers.

5. Finance — Score 3.4

The pre-financing credit facility and the introduction price discount are strong points of the DFA model. They enable the farmers to benefit from quality feed. Nevertheless, farm and business management is hampered by the shortage of credit facilities to cover investments as well as incidental expenses. Partners consider this to be a deficiency of the model, which explains the low score for this aspect.

6. Knowledge and skills — Score 3.6

Most dairy farmers affirmed that they attended the training sessions and considered them to be valuable. FGDs with non-participants showed that they are observing large differences in day-to-day dairy business practices between those who attended the training sessions and those who did not. Nevertheless, additional refresher training is still necessary—on cow feeding and feed management for farmers and on record keeping for the primary cooperative staff. Next to farmers, local government staff attended the sessions. Knowledge- and skill-building support to dairy producers by government institutions was weak. Their role in capacity building of farmers and other stakeholders was seen as insignificant.

7. Collaboration — Score 3.9

The set of implementing partners of the DFA model—IFDC, AKF, Family Milk, Etete and the government Cooperative Promotion and Livestock offices—appears to be an adequate selection. While AKF initiated and championed the model, later on the milk processors joined in championing the model. Working in good partnership—which is considered to be a prerequisite of the model—enabled these partners to implement the model successfully. Frequent sessions were held between the private companies, representatives of the farmers and local governments. Partners initially met regularly, then reduced the frequency to an as-needed basis. According to the participants, partners made conscious efforts to share experiences within the implementation area. Over ten field days were held in each of two areas. Due to limited involvement of local public agencies, synergy with other extension and cooperative support services remains limited. Limited efforts were made to share experiences to non-partners in other areas.

8. Evidence and learning — Score 3.1

The main approach towards monitoring of progress was regular communication, with meetings and assessment of project outcomes when needed. Data on performance at farm- and company level were collected by IFDC. Partners observed that collection and sharing of evidence was not systematic and that no ICT tools were used to collect and share data. As a result, learning about the model was mainly on individual company level, rather than collectively. This explains the low score for this ingredient.

9. Leadership and management — Score 3.6

Implementing partners have become equal partners. They contact each other when necessary and do not see the need for regular meetings anymore. However, this structure does not allow sufficient space for discussion when issues arise—this was evidenced by one partner experiencing insufficient support from partners when the model was under dispute in his company. As a result of this loose structure, further scaling up plans are not discussed. Partners are mainly interested in increasing the coverage of the model in the current areas. None of the partners expressed an immediate interest in scaling the model to other areas. They particularly felt that the partnership lacked people with the standing to influence policy makers on issues pertaining to scaling of the model.

10. Public sector governance — Score 3.3

Implementing partners have good relationships with local public agencies. Field data showed that at the grass root level government offices play a supportive role in ensuring that the targeted dairy farmers are indeed benefiting. One issue that was repeatedly raised was that technical extension provided by pertinent government offices was inadequate and needs improvement in order to promote expansion of forage, AI services, milk handling, etc.).

"The volume and quality of milk delivered by the model participants to our dairy processing plant have increased tremendously. The supply of quality dairy concentrate feed at a subsidized and fair price through us has enabled us to get sustainable suppliers and has aroused interest from other dairy producers to be included in the model. Without this benefit package it might have been difficult to attract and maintain customers."
(Family Milk key informant)

"The DFA model has enabled Alema Koudijs Feed to promote concentrate feed to a new and promising market segment with sustainable impact in potential dairy areas. We were able to attract 500 new customers within a short period of time and understood the necessity of establishing dealers in the project intervention areas; hence we established private feed dealers in both Debre Berhan and Fiche areas in addition to supply to Family Milk and Etete"
(AKF key informant)

AKF feed stored in Kuyu area

Hay stored in Degem area

The story of Zewdiness

Zewdinesh Legesse lives in Faji village in Basona Worena district of Amhara Region. At an age of 31 years, she is head of a female-headed household with four dependents. She cannot read and write. Before the DFA model started, she engaged in poultry and dairy production as well as cropping. According to her, since the crop- and milk yields were very low, she usually faced difficulties to sustain her family. During that period, her average monthly income from milk sales was about ETB 650 (20 Euro). After expenses for dairy feeds, the remaining amount was too little to cover other household food and non-food items. The distribution of concentrate feed on a monthly basis by Etete has brought significant changes in her cow's milk production and her monthly income from milk. She reported that her cow's milk production jumped from five to nine litres per milking. This has helped her to raise milk sales to ETB 4,000 per month. With this increasing income she was able to rent 0.5 ha of land at ETB 8000/year and she sharecrops an additional half hectare under share cropping (i.e. one share for the land owner and two shares for her). She plans to buy a purebred dairy cow at ETB 45,000–50,000. In the meantime, she would like to see regular and timely delivery of the concentrate feed.

Conclusions and recommendations

Fit in policy context

Given the considerable potential for smallholder income and employment generation from high-value dairy products, the Ethiopian government recognizes that development of the dairy sector can contribute significantly to poverty alleviation and nutrition security in the country. Through the DFA model, farmers are able to reach the milk production targets of the FDRE's Growth and Transformation Plan II 2014–2019, set at 12 litres/cow/day by 2019/20. Realization of the GTP plans obviously requires involvement and commitment of dairy farmers, private companies, development and public agencies. It also requires space for private chain embedded service models and for private service provision in a range of dairy-related services.

The FDRE's micro-enterprise development scheme, that commits to involve the unemployed youth in the dairy sector, in particular could use this experience as an opportunity to scale the DFA model. However, a policy on livestock feed sector development is lacking. Although some participants appreciated the existing policy and strategy related to dairy sector and livestock sector development, the implementation was said to be very weak. This was evidenced by the low involvement of the Cooperative Promotion Agency and Livestock & Fisheries Resource offices in implementation of the model.

Fodder oats crop in Fitche area

Effectiveness

The model is appropriate and addresses both technological gaps and marketing problems of dairy farmers. It simultaneously solves the constraint of feed supply shortages of farmers and milk supply shortages of dairy processing plants. It ensures feed supply to dairy farmers in the right quality and quantity, and smartly deals with 'willingness to pay' issues through credit facilities and introduction pricing. The training and extension services can be considered to be essential for increased milk yields—through addressing knowledge gaps at farm and cooperative level. Issues identified include the timeliness and dependability of feed supply, difficulties of milk processors to stick to milk offtake guarantees, and insufficient capacity building support by public agencies.

Despite hiccups in these routines, the participating farmers like to continue with the DFA model, seeing that this is their best viable option, as it involves: getting good concentrate feed; having a long-term regular buyer for their fresh milk, in both fasting- and non-fasting periods; getting a constant price; not needing to get credit to buy feed. In the meantime AKF has reduced the lead time for feed supply to around one week.

Farmers highly appreciated the quality of feed and the credit facility and were also positive about the training activities and timely milk payments. They were less positive about the cost of feed and milk market expansion, and clearly had concerns about the timely delivery of feed (lead time now improved to ca. one week). Routines that still need improvement in order to upgrade performance:

- Transfer of feed orders from farmers to the feed processor—with cooperative and/or processor in between—needs to be without delay
- The feed processor needs to have sufficient feed processing capacity to meet farmer demand in time
- Storage capacity along the feed distribution chain needs to be adequate
- Milk processors need to live up to guaranteed offtake commitments for milk meeting the standards
- Milk processors need to be able to convince farmers that standards are applied objectively and do not result in higher risk of rejection in the glut season.

Scalability

Partners are convinced that scaling of this model towards more farmers will benefit expansion and consolidation of their business. It is evident that advocating the model for use by new companies is not in the business interest of all model partners. However, facilitating organizations, such as IFDC, may use this experience for scaling by other partnerships.

Advancing feed to farmers, accompanied with credit and extension services, was a logical starting point in the Ethiopian context. Advancing additional inputs, such as lick-blocks, drugs, tools, etc., and services, such as AI and veterinary services, would be interesting additions to consider. Distribution channels may include agro-input shops and contracted service providers.

Site supervisor awaiting fresh milk in Kuyu area

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