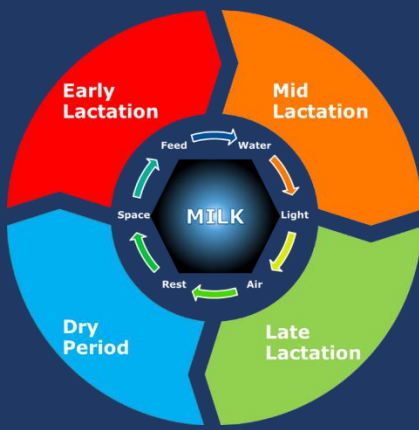


Building Rural Income through Inclusive Dairy Business Growth in Ethiopia (BRIDGE)

Lactation cycle focused advisory service to boost milk production and reproductive performance

Project brief



Introduction

Reproduction and milk production of cows are directly affected by farm management practices. The time during which a cow is producing milk is known as lactation. The time between one calving and the next is known as the lactation cycle. The cycle is split into four stages: early, mid, and late lactation, and dry period. Cows during early lactation (first two months after calving) are naturally very efficient at producing milk, which means that any change that affects production is visible within a very short time (1-2 days).

The Lactation Curve Approach (LCA) uses the animal's nature during this time to show farmers how good management practices can have a big impact on animal performance at no additional cost. Each extra litre of milk produced in this early lactation period, can result in 200 litres extra over the full lactation period. The required farm management practices are dependent on gestation and lactation stages. It is not just about production: animal health, fertility, and calf quality are also positively affected by good practices applied during the lactation cycle, which means that genetic improvement, calving interval, calf survival and growth, and animal health are also improved through LCA.

Several scholars agree that due to lack of cow identification, previous performance data and dairy farmers' low literacy levels, implementing lactation cycle-based dairy extension will be a challenge for smallholder dairy production systems. However, preliminary findings from the BRIDGE project's LCA pilot show that it is relatively simple to implement and has a positive impact on the adoption of good dairy farm management practices among the targeted farmers, as well as on cow and calf performance. It demonstrates the comparative advantage of transitioning from a generalist extension approach toward one that helps to better understand dairy cows' production- and reproduction stage specific needs and addressing these needs accordingly. Such an approach also boosts the extension service provider's professionalism, value, confidence, and acceptance.

The pluriform extension approach used in LCA implementation combines several message delivery tools (house-to-house advice, farmer group learning, and digital audio messages). It contains messages on smart feeding, watering, cow comfort, and management, tailored to the different stages of the lactation cycle. Moreover, establishing monitoring and follow-up support procedures is crucial for obtaining the intended results.

Transitioning from generalist extension toward focusing extension on what the dairy cow needs

We employ a pluriform extension strategy that combines several message delivery tools in lactation cycle-focused advisory services. It unifies advice on management, cow comfort, feeding, and watering into a single strategy that is adapted to each stage of lactation.

It demonstrates the comparative advantage of transitioning from a generalist extension approach towards focusing extension on what the dairy cow needs and addressing these needs appropriately.

It provides opportunities to generate trust and awareness the trust of farmers and development agents; to improve livelihoods, business profits, animal health and productivity. It opens doors to the implementation of medium and long-term strategies, such as forage production, genetic improvement, calf rearing, manure management, soil management, and farm economy.

Results

The lactation cycle based advisory service was piloted in earnest in the last quarter of 2022. It targeted a total of 2,847 rural milk producing smallholder households with 3,506 pregnant dairy cows in Amhara, Oromia and Sidama regions. served by 135 service providers. Pilot farmers' knowledge and adoption rate of good dairy practices, extension service providers skills, and performance of dairy cows (milk production, body condition, and fertility) and calves (birth weight, weaning age, mortality, and morbidity incidence) were improved because of the LCA implementation.

Extension service provider' skills

As a result of the LCA training, the service providers' knowledge and expertise in dairy farm management were increased, which in turn improved the quality of their advisory services and helped them gain the trust of dairy farmers. Considering this, they want to keep using and scaling the strategy, and interpreting performance indicators for milk production and herd health using cow observation signals. Benefits of LCA are analogous to those of consultative workshops with major stakeholder representatives. However, service providers' understanding appeared to be insufficient to convince farmers.

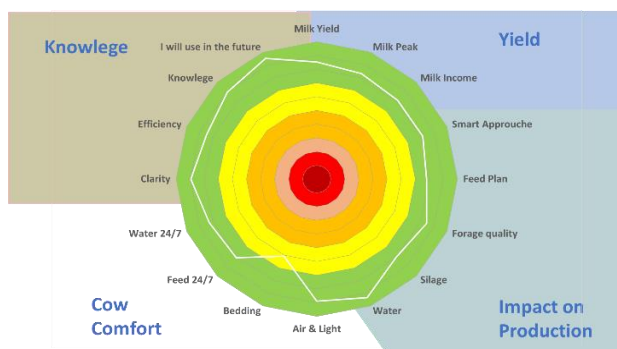


Figure 1. Extension service providers' skill on farm management

Adoption of good dairy farming practices

Feed and feeding: Most pilot farmers provide concentrate feeds to dairy cows at the appropriate production or lactation stage, a practice known as "smart feeding." In terms of basal feed, 87% of pilot farmers in Northwest Oromia (NWO) feed forage ad libitum or in sufficient quantities at least four times per day. Most pilot farmers in the Sidama, Southeast Oromia (SEO), and West Amhara clusters provided forage three to four times daily. In NWO, SEO, and West Amhara clusters, most pilot farmers prioritize feeding high-yielding cows, whereas in the Sidama cluster, 30% of pilot farmers feed all cattle types with the same kind and quantity of forage.

Implementation approach

Dairy farmer selection:

Farmers who had a cow at about six months of pregnancy were selected and organized into a dairy farm innovation group (DFIG) to improve service providers' outreach and promote peer-to-peer learning. DFIG members are farmers with cows who are six months pregnant at the time of selection. Service providers offer advice services and promote peer-to-peer learning to improve milk production and reproduction.

Extension service providers

Comprehensive skill-based training was given to extension service providers (DAs, Woreda experts, AI technicians, agro-input dealer extension workers, veterinarians) on the concept and application of the lactation cycle, cow signals, and feed planning (silage). The Cow Signals training (with the Look-Think-Act principle) helped service providers to improve the quality of their advisory services. It gave them a vital advisory skill to follow up on the impact of their advice.

Extension approach

The pluralistic extension approach deployed private and public extension service providers. They reached farmers to provide advisory service and guide them through the lactation cycle using the different advisory methods for joint learning and reflection. House-to-house visits and monthly digital messaging (by mobile phone) reinforce group extension messages. These tools allow service providers to guide dairy farmers in managing their cows throughout the lactation cycle

Monitoring and follow-up

Monthly monitoring and follow-up support systems established at the woreda level serve to record lessons learned and scale up best practices to others.

Silage making and feeding practices: Project data show that silage making and - feeding practices differ across regions. In Sidama, where fresh forage mostly is available year-round except for a two-month period with shortages, silage is not a top priority. In SEO, where silage making has been one of the biggest improvements in animal feeding and nutrition, pilot farmers plan to grow over 50% more silage in the upcoming growing season, compared with the previous season. Silage making and feeding still holds enormous potential for expansion and scaling in the West Amhara and NWO clusters.

Water provision: Pilot farmers in all clusters have increased the frequency of water supply to their lactating cows, although it is still far from the ideal 24-hour access to clean water. Across the clusters, only 18% of pilot farmers practiced 24-hour water availability (NWO 13%, Sidama 15%, West Amhara 21%, and SEO 26%). In SEO, 62% of farmers provide water to their lactating cattle at least four times per day. Most farmers observe that increased water availability results in visible increases in milk production. However, water shortage and lack of clean water are major factors hampering milk production.

Barn renovation: 80% of pilot farmers have modified their barn to improve cow comfort, which is crucial in improving milk production, fertility, and cow body condition. The most feasible and cheapest intervention is existing barn modification to allow adequate fresh air circulation and entry of enough light. This is affected by opening about one-meter-high window on the upper part of the barn's wall on all sides. This was realised by 47% of the farmers. Because of the old and traditional barn designs, government guidance on concrete barns, and inability to identify standard bedding materials, improved bedding materials are not yet widely in use.

Record keeping: Most pilot farmers were reportedly aware of the importance of record keeping but found it difficult to put into practice. A small percentage of pilot farmers considered record keeping being useless.

Dairy farming performance

Changes in peak milk yield (litre/cow/day):

After three month of implementation the improvement on milk production has been impressive. Many cows increase milk production in relation with the previous season on more than 3 litre per cow/day without extra cost, and at the same time improve fertility, health, and calf performance. At the time of data collection, 86% of the cows already had reached peak yield. Peak milk yield records were available from 55% of the total number of cows targeted (of which 88.2% cows were multiparous and 11.8% were heifers). The results show that cows that already reached peak yield on average showed 3.82 litre increase in peak milk yield as compared to the previous lactation, with a slightly declining trend for cows in advanced parity (>4th parity). Disaggregated by milk increment category, 14% increased peak milk yield by more than 6 litres/day, 42% increased from 4 to 6 litres/day and 36% from 1 to 3 litres/day (Fig.2). 3% of the cows showed no change in their peak milk yield and 4% decreased in peak milk yield.

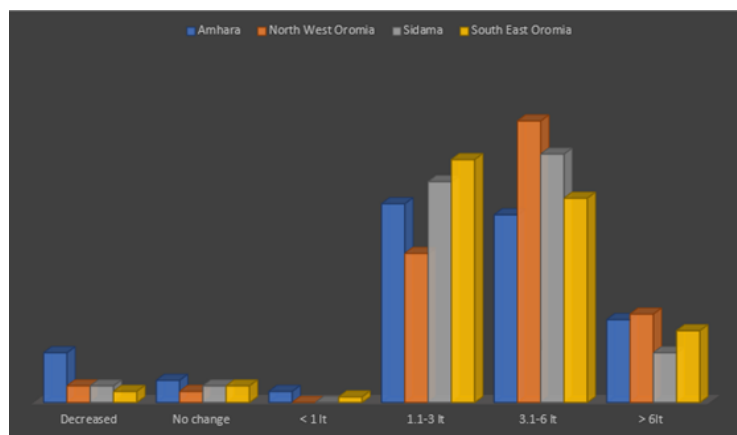


Figure 2 Proportion of cows with increase in peak milk yield (n= 1737)

Fertility improvements: Project data show that 52% of all cows exhibited the first heat after calving between 50 and 90 days, while 9% displayed heat within 50 days. Only 15% of the cows in all clusters showed poor heat. 1953 cows (76.8% of all targeted cows) were first inseminated between 60 and 100 days after calving. The number of services per conception (SPC) improved to 1.4. These are very good results compared with the usually low fertility during this period (February-May). By the time of data collection, 1076 cows were confirmed pregnant (with pregnancy diagnosis).

Calf performance: Studies carried out in Ethiopia over the last ten years show that youngstock have disease and mortality rates of 31% and 67%, respectively. According to project data, 57 (2.5%) of the 2311 new-born calves from dairy cows in the LCA pilot died in the first 4 months. Data on health incidence show that 23% of the calves had health problems, mainly pneumonia or diarrhoea. Calves were typically over 30 kg when they were born (77% of calves), which is a sign of successful dry period cow management.

Table 1 Performance of calves from LCA targeted cows

Region	Parameter	
	Disease Incidence (%)	Mortality (%)
SIDAMA	13	6.30
NW Oromia	31	3.10
West Amhara	23	1.20
SW-Oromia	24	1.80
AVERAGE	23	2.50

The Building Rural Income through Dairy Business Growth in Ethiopia (BRIDGE) project (2018-2023) is a dairy sector transformation project implemented by a consortium of SNV Ethiopia and Wageningen University and Research (WUR) and funded by the Embassy of Kingdom of the Netherlands in Ethiopia. BRIDGE works on all components of the dairy value chain and aims to improve income of smallholder farmers and contribute to the development of an inclusive dairy sector in Ethiopia. The target beneficiaries are 92,000 smallholder dairy farmers in four regions of Oromia, Amhara, Tigray, and Sidama/SNNPR.

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