# Innovative dairy farming in East Africa

## The challenge

Dairy farming is an important pillar of the rural economy in East Africa, providing essential nutrition and livelihoods for millions of smallholder households.[1] Across the region, smallholder dairy production accounts for most milk output, with countries like Kenya, Ethiopia, Tanzania, Uganda, and Rwanda collectively contributing about 68% of Africa's total milk production.[2]

But, despite its importance, the East African dairy sector faces persistent challenges. Milk productivity remains low, with yields significantly below the genetic potential of indigenous and crossbred cattle. In Ethiopia, for example, average milk yields are constrained by poor feeding practices, inadequate housing, animal health issues, and limited water availability.[3] These issues are mirrored across the region, where smallholder farmers often rely on rainfed pastures and crop residues, and they face seasonal feed shortages.

A critical barrier to progress is the limited reach and effectiveness of livestock extension services. These services, which provide technical advice and capacity-building to farmers, are frequently under-resourced, they offer generic rather than tailored support, and they struggle to engage remote and marginalised farmers. In many parts of East Africa, this results in farmers lacking access to up-to-date knowledge on modern feeding regimes, disease management, breeding technologies, and market opportunities.

Farmers face other systemic challenges too. Inadequate financial resources, poor infrastructure for milk collection and storage, and limited adoption of modern technologies such as artificial insemination and digital farm advisory tools hinder productivity. Together, these bottlenecks limit smallholder farmers' ability to improve their productivity and incomes, which in turn constrains the contribution of the dairy sector to regional food security and rural economic development.

**'I wasn't aware that free movement of air and light inside the barn was so important. Now that the barn is open, the cows seem happier, and the milk yield is better.'**

**Ato Desta Yohannes, dairy farmer**
Wondo-Genet Woreda, Ethiopia

[1] W. Thorpe, H.G. Muriuki, A. Omore, M.O. Owango, and S. Staal, 'Development of smallholder dairying in Eastern Africa with particular reference to Kenya'. *Paper presented at the UZ/RVAU/DIAS/DANIDA-ENRECA project review workshop 10–13 January 2000*, Harare, Zimbabwe.

[2] S. Bingi and F. Tondel, 'Recent developments in the dairy sector in East Africa: Towards a regional policy framework for value chain development', *ECDPM Briefing Note no. 78*, *Maastrict, ECDPM, 2015*. See also: Solidaridad Network, 'Dairy 2025: Unlocking smallholder productivity in Tanzania', Story, 11 June 2022, Utrecht, Solidaridad Network; and Food and Agriculture Organization of the United Nations (FAO), 'Gateway to dairy production and products: Milk production', Rome, FAO, n.d.

[3] Van Hall Larenstein University of Applied Sciences, *Climate-smart and inclusive dairy business models in Ethiopia and Kenya*, Utrecht, Netherlands Food Partnership and Velp, Van Hall Larenstein University of Applied Sciences, 2019.

## A novel solution

SNV and partners have identified, tested, and implemented a novel extension model that combines cow-centric practices for feeding, watering, and cow comfort with the lactation cycle: the Lactation Cycle Approach (LCA). Small farmer groups with pregnant cows meet monthly and receive tailored messages that align with the cows' physiological needs. These messages promote practices such as smart feeding, plus improved water supply, barn light, air, space, rest, and manure management. In this way, LCA contributes to improved milk production, animal health, fertility, and calf performance. It shows farmers how good management practices can have a big impact on animal performance at no additional cost.[4] And the approach also reduces greenhouse gas emissions and improves farm resilience.[5]

**The lactation cycle**

Lactation is the period during which a cow is producing milk. The period 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 a dry period. Cows are naturally very efficient at producing milk during early lactation, in the first two months after calving. Each extra litre of milk produced in this early lactation period can result in an extra 200 litres over the full lactation period.

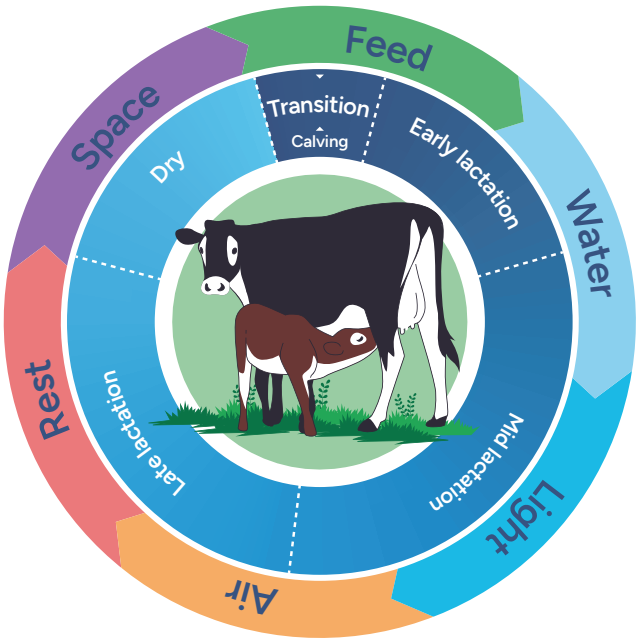



**Figure 1 The lactation cycle**

## Cow-centred dairy farming practices

Cow-centred practices aim to keep cows healthy, improve fertility, and support better milk production.

1. **Understanding the lactation cycle and management:** Cows produce the most milk during early lactation and so need extra nutrition. In mid and late lactation, milk production slows and cows prepare for the dry period, a resting phase before the next calving. Managing feeding, health, and reproduction according to these stages helps keep cows healthy and maximises milk production.
2. **Reading cow signals:** Closely observing critical signs in cows – including body condition, heat signs (estrus behaviour), manure condition, urine appearance, skin condition, and eye clarity – enables informed adjustments to feeding regimes, water provision, and barn renovation. This ensures improved animal health, productivity, and welfare.
3. **Delivering extension packages:** Advisory packages help dairy farmers enhance their productivity and yields.
   - ***Feed and water:*** Extension services help farmers understand how to feed cows according to their milk production and lactation stage. Advice is given on making and storing feed like silage and hay, or using free grazing; and the importance of clean, fresh water for cows to stay healthy and produce milk.
   - ***Barn improvement:*** Advice is given to improve barn conditions, by adding good light, fresh air, enough space, and resting places to keep cows comfortable and less stressed.
   - ***Fertility management:*** Farmers are supported with advice and practices to improve cow fertility, so their herds conceive and calve regularly.
   - ***Proper milking:*** This is a key practice under lactation cycle-based cow management. Farmers are taught to clean the udder and teats before milking, to stimulate the teats by stripping a few streams of milk to encourage milk flow, to milk completely but gently to avoid udder injury, to use clean equipment to maintain hygiene, to apply teat disinfectant after milking to prevent infections, and to handle cows calmly to reduce stress.

[4] Y. Bezabih, T. Taye, A. Alvarez Aranguiz, and J. van der Lee, 'The lactation cycle dairy extension approach', *BRIDGE Assessment Brief*, Addis Ababa, SNV Ethiopia and Wageningen Livestock Research, 2023.

[5] FAO and New Zealand Agricultural Greenhouse Gas Research Centre, *Reducing enteric methane for improving food security and livelihoods: Project highlights* 2015–2017, Rome, FAO, 2019; A. Khatri-Chhetri, P.K. Aggarwal, P.K. Joshi, and S. Vyas, 'Farmers' prioritization of climate-smart agriculture (CSA) technologies', *Agricultural Systems* 151(February): 184–191, 2017; L. Germer, 'Climate-resilient dairy cattle production: Applications of genomic tools to improve heat tolerance of dairy cows', *Frontiers in Veterinary Science* 8: 625189.

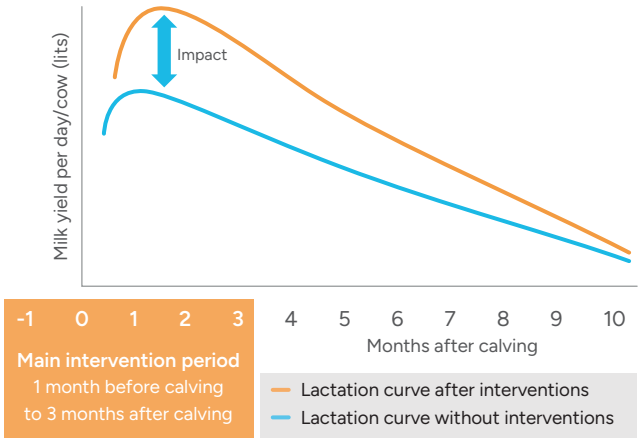



**Figure 2 Peak milk yield before and after the intervention**
*Source: SNV, LCA Concept note, Addis Ababa, SNV 2022*

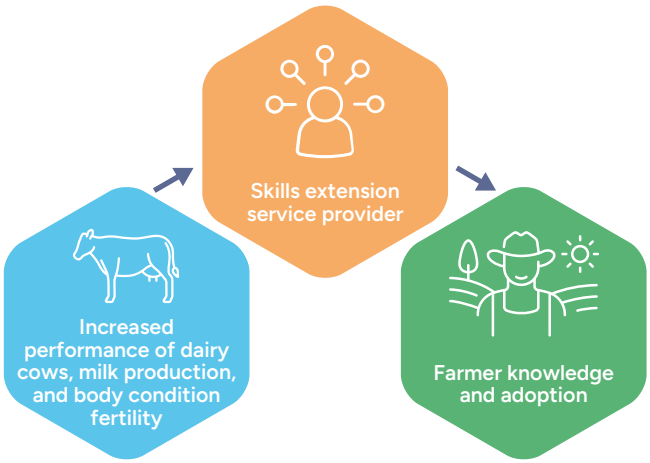
## Proven impact

LCA was implemented among 1,850 dairy farmers in Ethiopia. The results of this pilot programme show that early lactation practices – such as improved water access, barn renovations to improve cow comfort, and targeted feeding – led to rapid and significant increases in peak milk yields. By late 2022, following full implementation of LCA, the programme had achieved higher adoption rates for concentrate distribution and forage supply, although quality forage distribution and barn renovation improvements lagged. The cumulative adoption of LCA practices led to increased peak milk yields, beyond six litres per cow per day.[8]

In the pilot, more than 12,000 cows reached a peak milk yield. Of these, 78% showed an improvement in peak yield, with an average increase of 3.8 litres per cow. The initiative has since expanded to more than 19,000 farmers by collaborating with Dairy Farm Schools.

In LCA, both the lactation cycle and cow signals are integrated in the curriculum of Innovative Dairy Farm Schools. However, to promote widespread adoption of the approach, it is key to move beyond information dissemination and to actively engage with farmers and facilitate co-learning processes.[6] Here, we work with both public and private extension service providers to deliver a range of advisory services. These combine house-to-house visits, group learning, and digital audio messaging, enabling outreach to diverse farmers while also overcoming literacy challenges and providing inclusive support.

By rolling out cow-centric practices first, we build trust with farmers. This then opens up opportunities for medium- and long-term strategies, such as forage production, genetic improvement, calf rearing, manure management, soil management, and farm economy.[7]




[6] A. Nigus, Z. Ashebo, T. Zenebe, and T. Adimasu, 'Assessment of dairy production and management practice under small holder farmer in Adigrat Town', *Journal of Natural Sciences Research* 7(13): 17-22, 2017.

[7] Y. Bezabih et al., 'The lactation cycle dairy extension approach', 2023.

[8] Y. Bezabih, T. Taye, A. Ebro, M. Spoelstra, A. Alvarez Aranguiz, and J. van der Lee, *Innovations in dairy extension for low and middle income countries: Enhancing productivity and adoption by synchronizing smart dairy farming practices with lactation stages*, pre-print research paper, 2025.

## A participatory process

LCA follows a structured, participatory process to ensure effective learning and adoption among farmers. It comprises four steps:

1. **Prepare**
   - Gathering baseline data on cows and context.
   - Selecting dairy farmers based on their cows' pregnancy status, focusing on those who own crossbred cows that are pregnant beyond three months.
   - Forming small groups of 15-18 farmers within Dairy Farm Schools, based on geographic proximity and production systems to encourage peer learning and support.
2. **Launch**
   - Selection and training of extension agents on LCA and cow signal observation techniques.
   - Strengthening Dairy Farm School management, including through adult learning principles and facilitation skills.
   - On-farm coaching by extension agents.
   - Regular learning sessions focused on stage-specific cow management.
   - Open farm and exchange visits.
   - Use of digital tools, such as audio messages and mobile-based reminders, to supplement face-to-face training and help farmers recall key practices and stay engaged.
3. **Evaluate and improve**
   - Analysing qualitative and quantitative data for continuous learning.
   - Organising monthly review meetings of dairy extension service providers.
   - Conducting seasonal reviews of the dairy extension roll out.
   - Generating evidence to institutionalise and contextualise best practices.
4. **Scale**
   - Scaling up LCA across diverse agro-ecological and socio-economic contexts.
   - Linking with the Dairy Value Chain Alliance, agro-dealers, dairy buyers and processors, schools, and policy-makers.

## Our ambition

We aspire to transform smallholder dairy farming in Africa by placing the cow at the centre of farm management. LCA promotes innovative dairy farming practices that prioritise the health, welfare, and productivity of the cow throughout its lactation cycle. In Ethiopia we aim to reach 350,000 farmers by 2029 – but our ambition reaches beyond this.

We seek to empower 1 million farmers in East Africa by 2030 with practical knowledge and skills tailored to the needs of their animals. This will contribute directly to increased milk yields, improved animal health, and greater farm sustainability. But more than this, the approach fosters sustainable dairy systems that will benefit all actors in the dairy value chain.

To make our ambition a reality we will focus on two tracks:

1. Integrating cow-centric approaches in dairy programmes across East Africa.
2. Institutionalising the cow-centric extension approach beyond SNV, to also reach our partners such as the Food and Agriculture Organization (FAO), the German Agency for International Cooperation (GIZ), the International Livestock Research Institute (ILRI), and the African Union Inter-African Bureau for Animal Resources (AU-IBAR), plus potentially other foundations and private sector partners.

**'If the advisory service had been limited to the trainings, I would not have been able to access the knowledge and skills I have acquired by listening to the audio-messages. It has enabled us to increase the milk volume to four litres per cow per day. In terms of income, this means a raise of 33% per cow per day.'**

**Terga Moges, dairy farmer**
Wondo-Genet Woreda, Ethiopia

**September 2025**

SNV is a mission-driven global development partner working in more than 20 countries across Africa and Asia. Building on 60 years of experience and together with our team of over 1,600 people, we strengthen capacities and catalyse partnerships that transform the agri-food, energy, and water systems, which enable sustainable and more equitable lives for all.

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