

## Factsheet final findings Applied Research Fund Call 3



### Healthy Cows – Healthy Food – Healthy Environment: Enhancing safety and quality of milk in Ethiopia with a focus on reducing antibiotic residues

#### Summary

The objective of this project was to improve quantity and quality of milk produced by peri-urban smallholders with zero-grazing dairy systems, as well as improving the position of women. This participatory action research combined activities at both field- and laboratory level, based on the following research questions:

- Field level: What are the results of implementing the Natural Livestock Farming (NLF) 5-layer strategy in two communities in terms of cattle health and milk quality?
- Laboratory level: Which milk quality testing techniques are most adequate to establish an effective control system?

Special emphasis was given to promoting the use of medicinal plants for cattle health and improving calf management. The project has shown significant improvement of animal health, as well as reduced use of antibiotics, improved milk quality, increased farm income and improved position of women. The outcomes of this pilot are now used to support the Ethiopian Ministry of Agriculture to improve milk quality and reduce anti-microbial resistance, and to scale up the strategy in (other) dairy programs. In 2020 the activities were expanded with a survey on the effects of COVID-19 on the livelihoods of dairy farmers.

#### Final research findings

At *farm* level, dairy production has improved (in terms of both milk quantity and quality), as a result of the implementation of the NLF 5-layered strategy, with special emphasis on three of the five elements of this strategy: (1) the use of herbs to cure the most common diseases, (2) improving the care of calves to reduce the high mortality rates, and (3) improving the management, feeding and housing of the dairy cows and their calves. Farmers were surprised to experience that the herbal treatments tested, for example for treating mammary infections, were just as successful as conventional therapy with antibiotics while being more accessible and cheaper to obtain. This has increased their confidence in the possibilities to reduce the use of antibiotics and thus produce residue-free milk.

At *laboratory* level, the capacity and skills on milk (-product) quality analysis of laboratory personnel was strengthened, after which the milk quality and status of antibiotic residues in milk from community members was determined. This showed that the level of milk residues in the pilot communities was substantially lower than in other communities with similar (zero-grazing) dairy system around Addis Ababa.

At *field* level the trial is continuing to perform very well, which inspires farmers within and outside the project and has drawn the attention of consumers, policy makers and other dairy projects.

#### Outcomes achieved

##### Case study: Herbal treatment for disease control in dairy cattle

"Dairy cattle farmers find ethno-veterinary medicine more economical and effective for their livestock in controlling diseases than antibiotics", says Yenenesh Tamrat, a female dairy farmer who has been rearing cows for the past ten years. She applies herbal medicines since the ARF project training. Production of milk has increased from 9 to 15-17 liters/day. The interest in herbal medicines has also brought herbs like Aloe Vera back to her garden. Yenenesh Tamrat together with another woman dairy farmer in her village are preparing the herbal medicine for the cattle of the community. "Most of the herbs used for the recipes are either commonly available in our gardens and kitchen or the very least in our neighbourhood, which means they cost almost nothing." The medical costs for her cows have come down after opting for herbal medicines, now spending only 25% percent of what she spent previously.

**Project messages to**

**A) Actors from private sector:**

- Use of herbal medicine, combined with crucial animal management improvements, leads to increased cattle health, more and higher quality milk with less antibiotic residues, which strengthens consumer confidence in local milk provision and increases farmer income.
- Milk quality pricing system have to be combined with support to farmers to produce residue-free milk.
- Herbs in dairy cattle feed products can be a potential source for further improving dairy cattle health

**B) Civil society and practitioners organizations:**

- Extension services can be especially effective in supporting dairy farmers when supporting farmers to stimulate the use of herbs and improve their calf and dairy cattle management.
- Provision of training on herbal remedies and herbal gardens, can provide an additional source of income for women farmers, and improve their social status.

**C) Policy makers:**

- Milk quality control systems have to be combined with support to farmers to produce residue-free milk.

**Knowledge products**

- Meeting and training reports: [Natural Livestock Farming](#) & Presentation at [NLF webinar](#) - Dec. 2020
- Herbal Product use in local languages
- Special sessions at ESAP conferences and webinar
- Info ESAP Newsletters and policy briefs with project info
- ESAP e-list consisting of over 1000 professionals nationally
- Short video: for dairy farmers, general public & consumers (upcoming)
- COVID-survey report (upcoming)
- Poster at One Health Conference Wageningen University, October 2018
- PP in international conferences incl. [Global Agenda for Sustainable Livestock](#) (GASL, Kansas, Sept. 2019)
- [Linked-In](#) and [other](#) social media, incl [Twitter](#)

**Knowledge networks**

*Ethiopian Society of Animal Production (ESAP):* a knowledge network with 800 members, engaged in:

- Partnerships with national universities, national research institute, ILRI, and FAO.
- National steering committees and policy platforms.

*Foundation for Natural Livestock Farming (NLF)* is an international knowledge network, organising:

- Pilots and international exchange programs on practical solutions for local cattle health challenges
- International farmer to farmer training programs and policy influencing.

*Ethiopian entities* interested in upscaling project results:

- The State Ministry of Livestock and Fisheries Resources - milk quality regulatory programs.
- SNV-Ethiopia dairy project ([BRIDGE](#)) will upscale project results to 120.000 dairy farmers in 5 regions.
- [Gudina Tumsa Foundation](#) - local NGO interested to implement a dairy project with herbal alternatives.

**Knowledge co-creation**

This project was based on continuous linkage between the Ethiopian and Dutch research partners, with crucial input from Indian expertise on medicinal plants, while farmer's knowledge and organization was used as foundation for development. At the beginning of the project a participatory project planning was organized with a small group of female/male dairy farmers to prioritize and analyse the primary concerns related to dairy farming. The participatory problem ranking exercise by the community members showed high calf mortality rates, as well as cattle health concerns, dependence on outside technical support, and high production costs as major challenges. This was confirmed through a structured survey questionnaire. During the first year, a training on laboratory techniques for Ethiopian government laboratory personnel was organized at Wageningen Food Safety Research in the Netherlands. Afterwards a shipment of crucial missing laboratory material was organized. These elements provided the basis for milk quality control on antibiotic residues before and after intervention.

To address the main dairy cattle health issues, including mastitis, wounds, diarrhoea and fever, practical training sessions were organized with Indian experts from NLF India on herbal medicine: how to assemble the herbs, process these, and apply these on cows. Following the successful training the dairy farmers started using more local herbal remedies, which they found cheaper than modern drugs. Low investment costs and increased livestock productivity improved monetary profits. Three other visits and training sessions were organized with a Dutch farmer and veterinary input, with an especially relevant course on calf management. During the project, the milk produced by the farmers was analysed for quality. The trained laboratory personnel was able to correctly get milk samples at various stages of the intervention. The outcome was compared with the milk quality from other peri-urban farms, revealing a significant milk quality improvement. Bringing together the communities with government representatives, research institutions, NGOs and private sector stakeholders stimulated learning and identify further areas for collaboration. The success of the pilot is shown through upscaling the strategy within other dairy projects in the country.

**Consortium Partners**

- [Ethiopian Society of Animal Production](#)
- [Wageningen Food Safety Research](#)
- [Ministry of Livestock and Fisheries \(MoLF\) Ethiopia](#)
- [Dutch Farm Experience/NLF](#)

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**Project website**

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