



Livestock for Health in Kenya

Contributing to the prevention of acute malnutrition among children in pastoral households through nutrition-sensitive livestock programming in Marsabit County

Context

The Kenyan arid and semi-arid land, where the main livelihood is pastoralism, depend heavily on livestock. Within the arid and semi-arid land, animals' seasonal mobility in search of pasture and water is essential if livestock are to remain productive. However, growing pressure on pastoral land has led to a reduction of livestock mobility. Climate variabilities have resulted in increased frequency of drought, which has also affected forage availability. This in turn affects animal production and the subsequent availability of animal sourced foods, such as milk, meat and blood, which are essential components of a pastoralist household's diet. Such a chain of events contributes to a decline in child nutritional status.

Livestock-based interventions are likely to increase availability of, access to and consumption of animal sourced foods and to have a positive impact on child nutritional status. For optimum results, these can be accompanied by nutrition counselling, which has been shown to be a critical factor in driving improved child-care and feeding practices. However, there is a need for further evidence to determine the effect of such combined interventions in the prevention of acute malnutrition among children.

The Food and Agriculture Organization of the United Nations (FAO), in collaboration with the United Nations Children's Fund (UNICEF), Washington State University and other stakeholders, undertook a research-oriented project referred to as Livestock for Health (L4H). The project was implemented between August 2018 and September 2022 in Marsabit County, which is located in northern Kenya and consists of arid land.

The objective of the project was to determine the effect of the provision of livestock feed with or without nutritional counselling on reducing the risk of seasonal spikes in acute malnutrition among children under five years of age and pregnant and lactating women in dry seasons in Laisamis Subcounty in Marsabit County.

Key facts



Geographical coverage

Laisamis Subcounty of Marsabit



United Nations. 2011. *Map of Kenya*. Cited 26 April 2023. un.org/geospatial/content/kenya



Target group

1 734 households with pregnant and lactating women and children under five years of age in two intervention arms and one control group.

- Intervention arm 1:
639 households
- Intervention arm 2:
585 households
- Control arm:
510 households



Food system components

- food supply chains (production, handling and storage)
- consumer behaviour and diets

Complementing livestock and nutrition counselling with other multisectoral initiatives may present opportunities to amplify nutrition outcomes and offer additional livelihood options.

The selection of Laisamis Subcounty was based on the February 2018 rains assessment in Kenya, which showed that the subcounty had been projected to remain in Integrated Food Security Phase Classification Phase 4 for several months. This means that global acute malnutrition was at a critical phase in this subcounty. Furthermore, analysis of past National Drought Management Authority data in Marsabit County showed a positive relationship between:

- forage condition deterioration and increase in levels of acute malnutrition;
- increase in livestock price and increase in acute malnutrition; and
- reduction in trade practices (between livestock and maize) and increase in acute malnutrition.



In what ways was the Livestock for Health project nutrition-sensitive?

This project was designed as a cluster randomized control trial, with two intervention arms/groups and one control group. It supported pastoralist households with the provision of livestock feeds, in order to increase milk production and consumption of animal sourced foods.

Milk utilization cards, offering information on topics that included the importance of milk for children and pregnant and lactating women, as well as techniques for the safe handling of milk, were developed and used as part of the nutrition counselling.

The project provided enhanced nutrition counselling, using two entry points:

- promoting infant and young child feeding through the baby-friendly community initiative; and
- promoting household food utilization through practical training in food handling, hygiene, preparation/cooking demonstrations, food storage and preservation.



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Methodological approach

This project was designed as a **cluster randomized control trial, with two intervention arms/groups and one control group**. The study covered a total of four dry periods.

The inclusion criteria for the households were:

- presence of a mother (lactating or non-lactating) and a child younger than three years of age;
- ownership of livestock, with a minimum of 1 to 6 tropical livestock units (1 to 6 cattle or camels, 10 to 60 sheep or goats) and the willingness to have 1 or 2 tropical livestock units (1 or 2 cattle or camels, 10 to 20 sheep or goats) remain at the household during animal migration; and
- household consent to participate in the study.

The following figure provides a breakdown of the interventions that households in the different arms received.

Intervention group

1 Intervention arm

Food system elements:

Food supply chains

A total of 639 households participated.

- Predefined amount of livestock feed targeting milking animals. This consisted of 4 kg of range cubes per day to feed 2 tropical livestock units (equivalent to either 2 cows or 2 camels or 20 goats or 20 sheep). The project provided enough livestock feed for at least 60 days' use during each dry season.
- Livestock dewormers.

2 Intervention arm

Food system elements:

Food supply chains and consumer behaviour and improved diets

A total of 585 households participated.

- Predefined amount of livestock feed targeting milking animals. This consisted of 4 kg of range cubes per day to feed 2 tropical livestock units (equivalent to either 2 cows or 2 camels or 20 goats or 20 sheep). The project provided enough livestock feed for at least 60 days' use during each dry season.
- Enhanced nutrition counselling (covering infant and young child feeding and practical training in food handling, hygiene, preparation etc.).
- Livestock dewormers.

3 Control arm

Food system elements:

Food supply chains

A total of 510 households participated.

- Livestock dewormers only.

Steps in implementation of research activities

1. Preparatory phase

Data collection activities included:

- Selection of field study staff (enumerators, animal health assistants and nurses).
- Mapping of villages, health facilities and water points.
- Community data collection on knowledge of patterns and causes of undernutrition in the locality.
- Household identification, consent and registration for the research.

2. Baseline survey

Undertaken between September and November 2019 under the guidance of research supervisors, the activities included:

- Training of enumerators in data collection and entry (specifically in good clinical practices, interviewing techniques, use of phone-based data collection tools, collecting anthropometric measurements for children and women, food intake interviews, collecting biological samples from humans and livestock, standard operating procedures for the study).
- A community participatory study to understand the seasonality and factors associated with malnutrition among women and children.
- Piloting of the study tools and standardization.
- Administration of the questionnaires and biological sample collection for humans (blood) and animals (blood and milk).
- Data analysis and processing of the baseline data.

During the entire study, each household was visited every six weeks and at the end of every three months. Each household was followed for 24 months between December 2019 and December 2021.



3. Implementation of actual interventions

Data collection

Data collection was undertaken for all three arms of the study.

Every six weeks, the enumerators collected the following data:

- anthropometric measurements for children under five years of age and pregnant and lactating women. The measurements included: height, weight, age, gender and mid-upper arm circumference (MUAC);
- milk yields (litres of milk produced per day);
- food consumption patterns, including milk consumption (litres per day); and frequency of consumption; calculation of Household Dietary Diversity Score and Minimum Dietary Diversity (for children and for mothers); and
- data on symptoms of disease among humans and livestock.

The enumerators also collected the following:

- household socioeconomic data and demographics (every quarter); and
- biological samples, such as human blood, and livestock blood and milk (twice during the study period).

Provision of livestock feed

Households in intervention arms 1 and 2 received:

- 4 bags of livestock feed (50 kg each) one week before the start of the dry season; and
- 3 bags of livestock feed (50 kg each) on the 50th day of the dry season.

During the 24-month period, each household in intervention arms 1 and 2 received a total of 1 400 kg of livestock feed.

Enhanced nutrition counselling – step-by-step

Nutrition counselling was provided to households in intervention arm 2, who were spread across 12 villages in the 4 wards of Laisamis Subcounty. This was done every week (for two years).





Training of community health volunteers

- Food and nutrition activities were carried out using 71 community health volunteers (CHVs) recruited by UNICEF. The counselling was delivered through the Ministry of Health county structures.
- A 7-day training initiative was organized for all CHVs. They were trained in the basic modules of the Community Health Strategy and the baby-friendly community initiative, and provided with counselling in milk utilization.
- In addition, all the health workers, Community Health Assistants, nutritionists and the subcounty Health Management Team based at the health facilities located in the study areas underwent a 6-day baby-friendly community initiative training course.

Enhanced nutrition counselling at household level

- The CHVs visited each household four times per month.
- Activities undertaken at household level included: nutrition counselling, nutrition screening of children under five years of age and pregnant and lactating women, as well as malnutrition treatment defaulter tracing, and referrals to health facilities. CHVs were provided with kits that contained the following items: leather bag, torch, MUAC tape, spoon, mug, thermometer, registers and reporting tools. The nutrition counselling followed the Maternal Infant and Young Child Nutrition programme guidelines and also utilized the national counselling cards, milk utilization cards and livestock feeding cards. Key areas of focus included: feeding infants 0–6 months, complementary feeding, maternal nutrition, household food security, food groups and healthy diets, milk handling and utilization, and basic hygiene promotion. Special attention was paid to the provision of information on milk (based on milk utilization cards), which included: the benefits of consuming milk, hygienic handling and storage of milk, milk preservation and preparation. The CHVs were provided with monthly remunerations in line with Ministry of Health recommendations.

Monthly monitoring and support supervision

- Community Health Assistants provided community-level supervision support through interactive sessions with the CHVs.
- CHVs entered the data via Open Data Kit.
- Frequent monitoring was conducted at community level to assess how the CHVs were progressing with household visits, screening and referrals.
- Monthly review meetings were held with the subcounty Community Health Management Team, health workers and CHVs, to track progress of nutrition counselling.



Impacts

The randomized control trial has shown important impacts of intervention arms 1 and 2. These include:

Livestock feeding

The research project provided livestock feed to households in interventions arms 1 and 2. Livestock feeding was consistently associated with higher milk production at household level (both in dry and non-dry seasons).

- Households receiving livestock feed produced an average of 0.2 litres of additional milk per day, compared with the control arm (arm 3). This was a 25 percent increase in milk production.
- Due to the increase in milk supply at household level, there was an increase in beneficiaries selling milk in both intervention arms 1 and 2. The increased milk supply led to a reduction in the local market milk price, from Kenyan shilling (KES) 30–60 (USD 0.24–0.48) per litre to KES 15–20 (USD 0.12–0.16) per litre.

Livestock feeding coupled with enhanced nutrition counselling

- Children from households in intervention arms 1 and 2 consumed an average of 200 ml and 240 ml more milk per day, respectively, compared with those in the control arm. This represents a 58 percent increase (arm 1) and a 70 percent increase (arm 2) in milk consumption by children. Children and mothers in households receiving livestock feed during the critical dry periods combined with food and nutrition education (arm 2 only) consistently consumed more milk compared with those in the control arm.
- Mothers from households receiving livestock feed (intervention arms 1 and 2) consumed an average of 210 ml more milk per day, compared with those in the control arm. This represents a 233 percent increase in milk consumption compared with women from households not receiving livestock feed.

Child undernutrition outcomes

Child nutritional status was determined using monitoring of height-for-age (stunting), weight-for-height (wasting) and weight-for-age (underweight). Children's height, weight and MUAC were used to compute these indices. The provision of livestock feed only (arm 1) to households was significantly associated with:

- an 11 percent decrease in the risk of global acute malnutrition (computed by MUAC for age) among children;
- an 11 percent decrease in the risk of underweight among children;
- a 9 percent decrease in the risk of wasting among children; and
- an 8 percent decrease in the risk of stunting among children.

The provision of livestock feed and enhanced nutrition counselling (arm 2) was associated with:

- a 26 percent decrease in the risk of global acute malnutrition (computed by MUAC for age) for children (from arm 2), compared with children in the control arm. However, there were no significant impacts on other nutritional status indices.

Dietary diversity

The provision of livestock feed and enhanced nutrition counselling (arm 2) was associated with a 3 percent improvement in Household Dietary Diversity Score, compared with the control arm.

The odds of attaining Minimum Dietary Diversity in children was 2.5 times higher in intervention arm 2 (receiving feed + nutrition counselling) and 1.8 times higher in intervention arm 1 (receiving feed only), compared with the control group.





Cost and effectiveness of interventions

In this project, cost-effectiveness was calculated based on the cost per case of child wasting and stunting averted.

Programme effectiveness

- The feed only intervention (arm 1) reduced child wasting by 11 percent and stunting by 8 percent.
- The feed and nutrition counselling intervention (arm 2) reduced child wasting by 26 percent; no statistically significant effect on stunting was recorded.

Programme cost

- The total cost per beneficiary household for the livestock feed only intervention (arm 1) for the whole period (four dry periods) was USD 790 per household (the cost per beneficiary household was USD 197.5 per each critical dry period).
- The total cost per beneficiary household for the livestock feed and nutrition counselling (arm 2) for the whole intervention period of 24 months was USD 987.6.

Cost-effectiveness of the intervention

- Both the livestock feed only intervention (arm 1) and the livestock feed and nutrition counselling intervention (arm 2) were cost-effective in the prevention of child wasting.

Impact on gender

As a result of the provision of livestock feed to households (intervention arms 1 and 2), women spent less time grazing livestock (10 minutes per day) and fetching grass for animals at the homestead (103 minutes). Consequently, women had more time available per day, which they spent on household chores, leading to increased time spent on cooking (15 minutes), milking (1.9 minutes), child care-breastfeeding, feeding children (16 minutes), and sleeping (18 minutes).

Implications of COVID-19

COVID-19 led to the disruption of health and nutrition service delivery in the study area. These included a reduction in the number of health facility visits by household members, suspension of population-level assessments, and the suspension of outreach services and gatherings. This led to a gap in household counselling visits between March and May 2020.

To mitigate this impact, UNICEF procured and distributed masks to all CHVs undertaking nutrition counselling for households. Other physical coordination meetings were suspended and replaced by virtual coordination and programme monitoring.



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Sustainability

The provision of livestock feed has proved to be a key intervention, leading not only to increased household milk production during the dry seasons, but also to fewer deaths of weak animals.

More needs to be done to ensure local availability of livestock range cubes (livestock feed), among other types of livestock feed in the local markets, especially during the dry seasons, as the pastoralists were willing to adopt this model during dry seasons.

The communities also showed themselves willing to gain skills and benefit from technical assistance in crop production through kitchen gardens. Such an approach would enable them to access fruits, vegetables and legumes for household consumption, thereby diversifying their diets and reducing overreliance on livestock and markets for purchase of other foods.

Replicability and upscaling

As of 2022, plans are under way to replicate this project in Chad. Within Kenya, the interventions can be used in other pastoral regions, especially when early warning systems indicate the need for intervention.

Challenges experienced

- Pastoral communities are usually on the move, and this interrupted household follow-ups. Tracking community calendars will therefore aid in the preparation and adjustment of counselling sessions to fit community needs. In cases where households move and do not come back, there were options for recruiting new CHVs to support the household's follow-up in distant locations.
- The COVID-19 pandemic led to the disruption of household counselling visits between March and May 2020.



Key learning

- Nutrition-sensitive food system interventions that are implemented with a research lens are important in generating much-needed scientific evidence that demonstrates their contribution to the prevention of malnutrition.
- Support to improved livestock production, especially if combined with nutrition counselling, can make a significant contribution to the prevention of malnutrition in women and children.
- Complementing livestock and nutrition counselling interventions with other multisectoral initiatives may present opportunities to amplify nutrition outcomes and offer additional livelihood options. Examples include: (i) social safety net programmes to facilitate the purchase other diverse foods by vulnerable households; (ii) crop production activities; (iii) improved water and sanitation infrastructure, to reduce open defecation and enhance hygiene practices; and (iv) access to well-equipped health centres for pregnant and lactating women.

Testimonies

The evidence and testimonies showcased in this note have been collected through field interviews carried out after the closure of the project, with the aim to collect the views of the project participants. In collaboration with FAO Kenya, FAO's Knowledge Platform on Emergencies and Resilience, and FAO's Food and Nutrition Division, a nutrition expert

developed the interview guides adapted for different project target groups, including community-level beneficiaries, FAO and UNICEF staff, implementing partners and government county staff. The interview guides were administered in collaboration with county partners and government teams, who facilitated implementation of the project activities.

Maria is one of the beneficiaries of the L4H project in Laisamis Subcounty. She explained: *"I have 12 goats that I keep. This project supported me by providing livestock feed and nutrition counselling. Thanks to the feed, the health of our livestock greatly improved, and we were able to get milk for household consumption. We were able to get one cup of milk in the morning and two cups of milk in the evening. Because of this, I was able to give my young child extra milk in the evening, and I have seen improvements in my child's health and well-being. I received nutrition counselling on how to breastfeed, the introduction of complementary foods at the age of six months, and how to set up a kitchen garden. I also learned about proper hygiene after using the toilet."*

Piliza Khoiyan is one of the beneficiaries of the livestock feed only intervention of the L4H project in Laisamis Subcounty. She explained: *"Thanks to this project, we used to get three bags of livestock feed at a time. I would feed about 10 livestock, every morning and evening. The feed helped me to supplement what the livestock had eaten in the fields. With the supplementary feed, the livestock were able to produce milk, they were in good health and they were fetching good prices when sold in the market. Without these feed, their production is very low or at times, zero. And they also become weak. I have seen the importance of feed to my livestock. These pellets had great impact on the livestock. As such, I sometimes try to buy some feed in the markets, though it is very expensive."*

Partners

Resource partners

- United States Agency for International Development (USAID)'s Bureau for Humanitarian Assistance, Office of Technical and Program Quality.

Technical partners

- FAO
- UNICEF
- Washington State University
- Government of Kenya
- Marsabit County Government
- National Drought Management Authority
- PACIDA
- Concern Worldwide

Bibliography

FAO. 2018. *Livestock programming for nutritional improvements in children under five years of age*. Project document. Nairobi, FAO.

FAO, UNICEF & Washington State University. 2022. *Livestock programming for nutritional improvements in children under five years of age and pregnant and lactating mothers*. Baseline report. Rome. <https://doi.org/10.4060/cb8625en>

Government of Kenya. 2018. *The 2017 short rains season assessment report*. Kenya Food Security Steering Group (KFSSG). Nairobi. www.ndma.go.ke/index.php/resource-center/send/58-2017/4767-sra-national-report-2018

Thumbi, S.M. et al. (forthcoming). *The Livestock for Health study: A cluster-randomized control trial for the prevention of acute malnutrition in women and children through livestock interventions among pastoralist communities in northern Kenya*.

UNICEF. 2021. *Livestock programming for nutritional improvements in children under five years of age*. UNICEF-FAO partnership. Progress report. January 2020 to May 2021.

UNICEF. 2022. *Livestock programming for nutritional improvements in children under five years of age*. UNICEF-FAO partnership. Final report. August 2022.

Washington State University 2022. *Technical support and implementation of livestock programming for nutritional improvement in children under 5 years in Marsabit County, Kenya*. Summary of results of the field trial. Kenya.

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Contact

.....
FAO Representation in Kenya
FAO-KE@fao.org

.....
Food and Nutrition Division
Nutrition@fao.org
fao.org/nutrition/policies-programmes

.....
Knowledge Platform on Emergencies and Resilience
KORE@fao.org
fao.org/in-action/kore

.....
**Food and Agriculture Organization
of the United Nations**

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