

Feed and health package for improved small ruminant production

Based on a new, locally available feed, less wastage, and better veterinary care, the feed and health package improves farmers' food security and incomes by increasing livestock productivity.

Authors: **Augustine Ayantunde** (International Livestock Research Institute), **Sadat Salifu, Solomon Konlan** (Council for Scientific and Industrial Research, Animal Research Institute), and **Théophile Dembélé** (Association Malienne d'Éveil au Développement Durable)

Description of the technology

The feed and health package for improved small ruminant production has three complementary aspects: a) a home-made feed formulated from locally available resources to supplement the diet; b) better veterinary care, including vaccination and deworming; and c) improved feed troughs to reduce wastage.

The supplementary feed of 200–300 g per animal per day comprises cotton seed cake, maize and wheat bran, and cotton and soybean seed. The ingredients are mixed in prescribed ratios that have been shown through research to address common nutrient deficiencies. The improved veterinary care includes annual vaccination of sheep and goats against ovine rinderpest (also known as 'peste des petits ruminants' or PPR), and pasteurellosis (where necessary, twice a year), with additional prophylaxis in the form of antibiotic and multivitamin injections every quarter, and deworming twice a year. On average, the overall medication cost per animal is about USD 0.60 per year. The third component includes building improved feed troughs made from locally available materials (wood and grass for thatching) to improve feeding efficiency and reduce wastage.

Farmers applying the feed and health package can double the size of their flocks within a year due to a higher birth rate (186% in the treated animals compared with 97% in the control group) and reduced mortality (from 30% to about 13%). Animals provided with the feed and health package experienced twice the average daily weight gain, with goats and sheep in the treatment group gaining an average of 43 and 47 g per day, while in the control group, goats gained 23 g and sheep 17 g per day.

Key messages

Increased livestock productivity:

Flock sizes doubled within a year due to a

HIGHER BIRTH RATE and **REDUCED MORTALITY**

(from **30%** to about **13%**),



with daily weight gain increasing by around 100%

Better food security:

The growth in flock size allowed farmers to spend



30%

more on food for their families

More resilient livelihoods:

Livestock provide valuable manure for

SOIL FERTILITY



and a form of

INSURANCE AGAINST POOR HARVESTS



Conditions that favor uptake

Mixed crop–livestock systems: Small ruminants are an integral part of mixed crop–livestock systems, where animals have access to pasture and crop residues as the principal feed resource. They also provide valuable fertilizer in the form of manure that can be applied to the crops.

Access to inputs and markets: This intervention is most suited to areas having effective agro-input systems, particularly veterinary drugs and animal feed, and access to markets for small ruminants. Market growth is being driven by increasing urbanization, with a rising demand for meat and milk products in West Africa.

Appropriate housing: This is essential to facilitate the collection of manure and prevent the spread of diseases that may result from poor housing with inadequate ventilation and overcrowding. Good housing also protects against theft and accidents associated with free roaming.

Alignment with household resource endowments

Small ruminants are an essential component of livelihood strategies in resource-poor rural areas of West Africa. The animals fulfill various roles in household food security, providing meat and milk, and a source of income to meet food and cash needs. They also serve as food security insurance for most smallholder families in the event of crop failures. Rural women and youth are particularly involved in rearing small ruminants, and this activity provides an important source of employment and empowerment. The feed and health intervention therefore directly addresses the needs of resource-poor, small-scale farmers because it is affordable and appropriate to the local situation.



Necessary ingredients for implementation

Ownership of at least six animals: Given the cost involved in supplementary feeding and health care, the intervention is best suited to farmers who own at least six sheep and/or goats. This factor was demonstrated in the pilot studies conducted in Ghana and Mali.

Access to veterinary services and feed supplements: Access to veterinary services is essential, particularly for vaccination against PPR and pasteurellosis, with increased animal growth rates also being highly dependent on provision of the supplementary feed.

Suitable housing: The animals should be kept in improved housing, particularly after returning from free ranging, when they are fed the supplement. They require adequate ventilation and a compacted or cemented floor to allow for cleaning and manure collection. Secure housing will also protect the animals against theft and accidents.

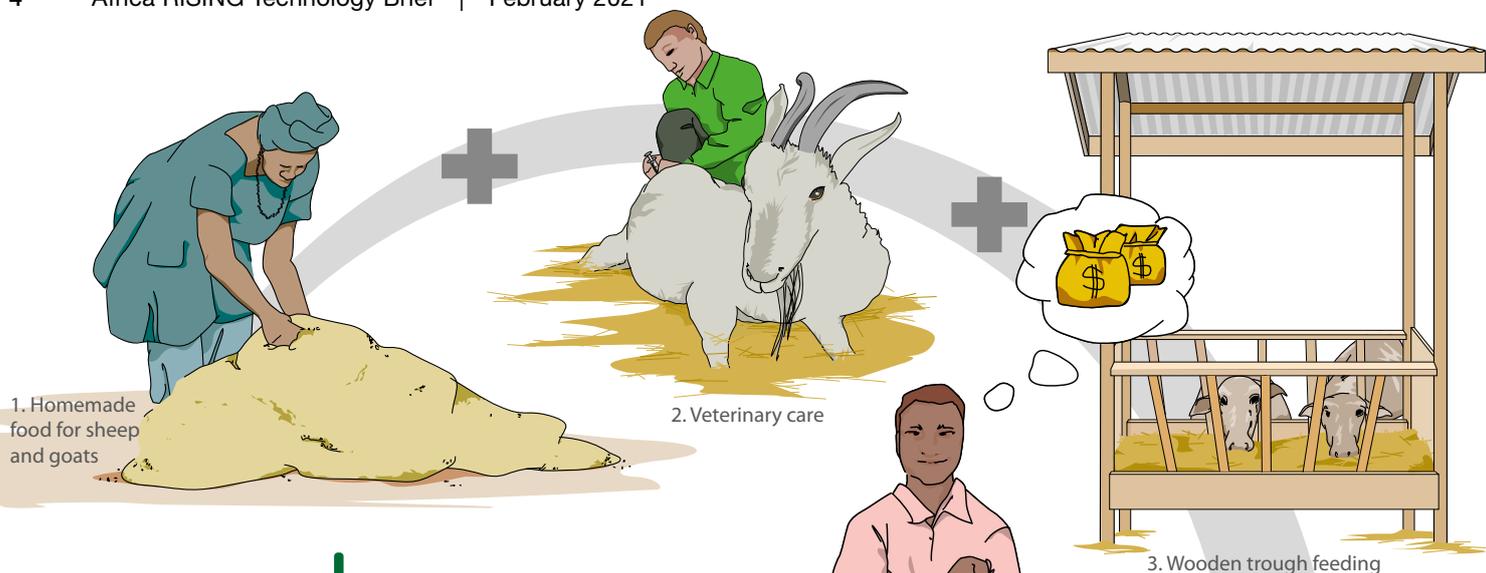
Adaptation possibilities

The feed supplement part of the package can be adapted based on the feed resources available locally. Most sheep and goats in small-scale crop–livestock systems feed mainly on pastures and crop residues; consequently, their diets are deficient in protein, particularly during the dry season. Farmers can formulate a mixed ration based on the ratio of three parts roughage (maize, sorghum, or millet straw) to one part protein-rich feed (cowpea hay or groundnut haulm). The mixed ration used for the study in Ghana consisted of 300 g maize, 282 g maize bran, 150 g wheat bran, 150 g whole cotton seed, 40 g fish meal, 50 g soybean meal, 8 g common salt, 10 g mineral-vitamin premix, and 10 g dicalcium phosphate. This quantity provides a daily supplement for six sheep. The improved feed troughs can be constructed from readily available local materials, such as wooden poles and grass, with no need for commercial planking or corrugated iron.

Where was the technology validated?

The information presented was derived from pilot research studies conducted on farms in Northern, Upper East, and Upper West regions in Ghana, and in Koutiala district in southern Mali. The pilot studies were conducted between 2013 and 2018 in both countries.





1. Homemade food for sheep and goats

2. Veterinary care

3. Wooden trough feeding



Potential benefits to users



Animal productivity: Farmers applying the package can double the size of their flocks within a year, due to a higher birth rate and significant reduction in mortality. Daily weight gain also increases. This enhanced livestock productivity increases household incomes and supports more resilient livelihoods.



Food security: The increased household income can be used to buy food for the family. Livestock also provide a form of insurance as they can be sold during times of poor crop harvest.



Soil fertility: Manure can be collected from animal housing more easily than from pasture, and can be applied to the fields to boost crop yields.



Empowerment of women and youth: Women and youth play an important role in rearing small ruminants; this intervention supports their empowerment and incomes.



Efficient livelihoods: The package enhances livelihoods and boosts efficiency through saving on labor (time spent herding animals), increased grazing time (animals do not need to walk so far), avoidance of feed wastage (animals fed via troughs), and reduced risk of animal exposure to theft, accidents, and diseases (through adequate housing).



4. Healthy and productive flocks



Things to worry about



Veterinary services: The main concern is access to veterinary services, which can be challenging for many rural communities. It may also be difficult for farmers to be confident of the quality of the veterinary products they buy, due to the lack of an effective regulatory system. Establishing local agricultural input shops and building the capacity of the community animal health workers can facilitate access to veterinary services.



Feed availability: Feed resources may become scarce, especially during the late dry season (March to May). Strategic supplementation is necessary during this period to ensure good animal performance.



The Africa Research In Sustainable Intensification for the Next Generation (Africa RISING) program comprises three research-for-development projects supported by the United States Agency for International Development as part of the U.S. government's Feed the Future initiative. Through action research and development partnerships, Africa RISING will create opportunities for smallholder farm households to move out of hunger and poverty through sustainably intensified farming systems that improve food, nutrition, and income security, particularly for women and children, and conserve or enhance the natural resource base. The three projects are led by the International Institute of Tropical Agriculture (in West Africa and East and Southern Africa) and the International Livestock Research Institute (in the Ethiopian Highlands). The International Food Policy Research Institute leads an associated project on monitoring, evaluation, and impact assessment.

Africa RISING website: <https://africa-rising.net>



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