Photo : Sara Lysholm
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Factors Enabling Sustainable Goat Production in Zambia

This policy brief is based on the insights from a workshop in Lusaka: 13th to 14th November 2019

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Key messages and recommendations

- To solve many of the key problems in goat production, joint efforts among value-chain actors are needed.
- To coordinate efforts and improve goat health, actors in the goat value chain need to have platforms where they can meet and discuss challenges and jointly agree on solutions and coordinate activities.
- Many of the problems listed by stakeholders in the goat value chain are easily solved with access to finance, advisory support and resources (e.g. medical supplies, grazing areas, water etc.). It is important that policy makers focus on solving these immediate problems which are likely to have significant positive impact on animal health and production.
- Research needs to consider the diseases important to livestock farmers and other stakeholders on the ground. If research on diseases should be accepted as relevant by value chain actors, there needs to be a balance between what local actors perceive as real and current problems and diseases that are of global or regional concern.

Introduction

Market participation among smallholder livestock farmers has been recognized as a poverty reduction strategy. In recent years small livestock, specifically sheep and goats, started to receive growing attention. These small ruminants are accessible to households and individuals who do not have the capacity and means to keep and trade in larger livestock. Goats have a unique potential to alleviate poverty and ensure food security even under harsh climatic conditions. However, with the growing livestock trade and market engagement, the risk for spreading infectious diseases also increases.

Disease and mortality among goats can have devastating effects on a family's livelihood. Mortality rates of animals in low-income countries can be 3-10 times higher than in high-income countries[1]. Therefore, healthy animals are key to any livestock production to be economically, socially and ecologically sustainable. Healthy livestock are more productive and consequently contribute to food and nutrition security, and livelihoods.[2] In addition, livestock that are healthy do not need antibiotics, as such contributing to lower use of antibiotics and lowered risk for development of antimicrobial resistance (AMR).

Trade in small ruminants in the Global South is seldom formalized. Informal trading routes are commonly less transparent, lack standardized pricing systems and have either no, or insufficient, public health protective measures, such as control of slaughter hygiene and meat inspection. Informal value chains are also often longer than formal value chains, which limits the value of the trade to smallholders and creates specific challenges for disease control. Thus, formalizing the value chains of small ruminant production and improving disease control could aid poverty alleviation efforts.

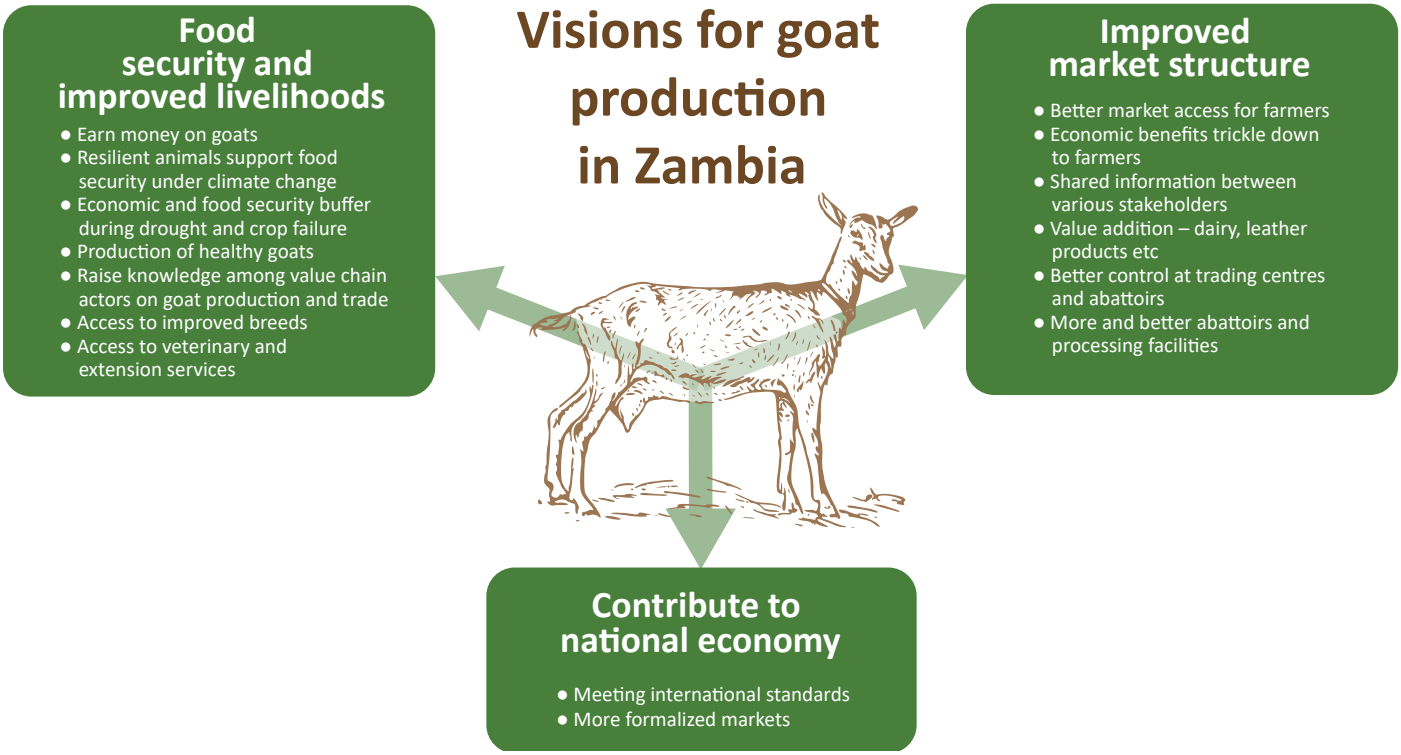
A two-day workshop in Lusaka, Zambia gathered key small-ruminant value chain actors, specific to the goat value chain: farmers, traders, breeders, veterinary assistants, livestock officers, extension workers, veterinarians, researchers, government representatives working with small ruminants from city to national level, and NGO representatives working with small ruminant production and smallholder livelihoods. We discussed key challenges and opportunities in goat production and important health problems as perceived by each stakeholder group.

Box 1: Workshop organizers

The workshop was organized by the research project "Factors limiting sustainable small ruminant production in Tanzania and Zambia" (funded by the Swedish Research Council; Grant no: 2018-03956), Swedish University of Agricultural Sciences (SLU) in cooperation with The University of Zambia (UNZA) and Musika Development Initiatives (Musika)

1 Pradère, 2014. Rev Sci Tech Off Int Epiz. 33(3):735-44

2 Rushton et al, 2017. Animal health in development – its role for poverty reduction and human welfare. The Expert Group for Aid Studies, Report 2017:03



This brief presents a summary of the discussions and points out some key opportunities and challenges perceived along the goat value chain. While presence and prioritization of diseases and the extent to which different control measures that are taken throughout the value chain will in part be specific to Zambia, the information and recommendations provided are relevant to other informal livestock value chains across the region.

Important diseases and health problems of goats in Zambia

In general, goats are seen as comparatively healthy and hardy animals. Nevertheless, there are diseases that have considerable negative impact on goat production. There was significant agreement among the groups regarding which diseases and health problems were considered important. In general, farmers and traders tend to speak of goat disease in terms of clinical signs, such as diarrhea, abortion, coughing and transportation stress, rather than specific diseases, while veterinarians and researchers use a more specific language. It is not always known what causes the different clinical signs and they may not always be due to infections.

Here are a few examples of the diseases or health issues that were commonly mentioned at the workshop. Almost all of the mentioned health problems are associated with poor management and are often relatively

Box 2: Issues discussed and stakeholder groups.

During the workshop participants were divided into groups according to their self-perceived main roles in goat production: *Farmers* (individual farmers and farmer organizations); *Traders* (individual traders and trader organizations); *Extension* (extension workers, veterinary assistants, livestock officers and people with similar advisory role to farmers); *Research and Policy* (those to a lesser extent working directly with value chain actors including veterinarians, researchers and policymakers).

During the workshop, the stakeholder groups discussed their respective experiences of goat production, trade, illness and health guided by the following six questions:

- Why do you engage in goat production/goat trading?
- What is your vision for goat production?
- What are the main constraints to reaching this vision?
- What are the main health problems in goats?
- What do you do today to keep goats healthy?
- What would you need to improve goats' health?

easy to prevent if sufficient resources are available. External parasites and gastrointestinal parasites were ranked among the top five health issues by almost all groups. The external parasites category encompasses mites, lice and fleas that cause severe itching and damages to the pelt, as well as ticks that can spread disease. Gastrointestinal parasites are common causes of weight loss, poor production, diarrhea and occasionally anemia, among other problems. External parasites can for example be prevented by regular application of acaricides and internal parasites by periodica dministration of deworming drugs. Some external parasites such as mites can also be prevented by providing good housing for the goats during the rainy season, as wet skin is less resistant to infections.

- Diarrhea is a common clinical sign observed in Zambian goats, and the disease outcome is often fatal. Diarrhea can result from viral, bacterial or parasitic infection but also from improper feeding.
- Abortion can be caused by infections of which many are zoonotic, meaning they are harmful to people. Examples include Brucellosis, Rift Valley fever, Toxoplasmosis. Abortion can also be a result of stress, poor feeding or ingestion of mycotoxins.
- Respiratory tract disease can be characterized by symptoms including shortness of breath, coughing and nasal discharge. More severe forms are often caused by viral or bacterial infections, whereas milder forms also can result from dirty and dusty environments.
- Heart water is a tick-borne bacterial disease caused by *Ehrlichia ruminantium*. The disease progresses rapidly, and characteristic clinical signs are fever, neurological signs and respiratory distress. Heart water can be prevented by the use of acaricidal drugs that reduce the burden of ticks.
- Pulpy kidney disease is caused by the bacterium *Clostridium perfringens* type D and is often associated with a sudden high intake of carbohydrate feed, leading to bacterial overgrowth and increased toxin production, which in turn cause inappetence, diarrhea and sudden death. Pulpy kidney disease can be prevented by proper feeding routines where intake of carbohydrates is limited and offers sufficient amounts of roughage such as branches and bushes. Vaccines are available but does not work optimally for goats, and since it has to be administrated many times in a year, it is not a feasible alternative to most Zambian small ruminant farmers.
- Foot rot is caused by soil bacteria and will often appear in wet and muddy conditions, which damages the protective layers of the hoof and makes it less resistant to infection. For example, foot rot can be prevented by providing good housing that averts water leakage and by regular cleaning and removal of feces. Foot rot can also be prevented by building goat houses that are raised above the ground with a floor that is permeable to fecal matter, enabling the feces to drop down on the ground and preventing the goats from stepping on it.

What can be done to mitigate illness in goats?

There are a number of preventive measures that can be undertaken to avoid and limit the spread of goat diseases and to prevent the spread of pathogens to humans at the farm, in the trading center and the abattoir. These measures are more or less general to any livestock species. Below we list the preventive measures that were brought up during stakeholder group discussions, and we provide some comments.

At the farm

- Dip and deworm animals regularly
- Check for disease signs proactively
- Have access and be willing to partake in preventive vaccination
- Provide clean and ventilated housing raised from the ground
- Provide (and have access to) good quality pasture
- Provide (and have access to) disease free supplement feeding during dry period
- Provide (and have access to) mineral licks
- Provide (and have access to) clean water
- Quarantine of new animals entering the farm
- Isolation of sick animals
- Accessible and reasonably priced vaccines and medicines

During trade

- Ensure safe transport of animals
- Regular cleaning and disinfecting of pens at the trading centre
- Preventing live animals from leaving the trading centre
- Better and regular public health inspections of abattoir
- Ensure traceability, if a goat gets sick at the market it is important to be able to trace it back to the source
- A system for removal of organic waste management from the abattoir
- Access to a vet clinic where drugs can be bought, and vet assistance found near trading centre

Other actors

- Breeding programmes and supply of improved breeds to smallholders
- Efficient laboratory diagnostics
- Encourage cross-border collaboration
- Promote artificial insemination
- More resources to livestock extension services

During the workshop it was also suggested to have foot baths for humans and animals at trading centers. This is a common disease preventive measure in livestock production on commercial farms. We have not listed this recommendation above as it may entail significant logistical implementation challenges. Also, foot baths would probably have limited or no actual effect on disease spread. In fact, the practice could even increase the risk for disease spread through contaminated foot baths if the bath is not used correctly and regularly cleaned, which is difficult in an informal and resource-constrained trade environment where many people move about daily. The foot bath can thus give a sense of false security, leading to other preventive measures not undertaken.

Experienced key challenges limiting best practice

The different stakeholder groups were asked to discuss and rank the limitations they face today that prevent implementing best practices. There were several similarities between the groups. Here follows a summary of the discussed key challenges:

- **Resources**
  In all group discussions, lack of necessary resources was mentioned. This includes lack of finance and of access to loans and subsidies, which was especially emphasized by the farmers. The groups also discussed difficulty accessing improved breeds that can produce more than local mixed breeds. Another commonly mentioned limitation was poor access to affordable high-quality feed and shortage of grazing land, especially for communal grazing. Difficulties accessing grazing land and scarcity of water points was believed to have been exacerbated by climate change and poor rainfall in recent years.

- **Access to information and veterinary assistance**
  The group of veterinarians, researchers and policymakers considered poor knowledge among farmers and traders to be an important limitation, while farmers, traders and the extension workers on the other hand emphasized having poor access to information regarding small ruminant husbandry and health, as well as limited access to technical expertise such as veterinarians and para-veterinarians. Also, the extension workers mentioned that even when their assistance was readily available to farmers, farmers were unwilling to call for veterinary aid. The traders on the other hand expressed that calling a veterinarian or para-veterinarian is very expensive and hence not a feasible alternative for many.

- **Value chain infrastructure**
  The Zambian small ruminant market structure is informal and characterized by poor infrastructure and a high number of middlemen, leaving little profit to be gained for farmers. Markets are also few and hence not accessible to all Zambian farmers. Formalizing the markets and reducing the number of middlemen was expected by participants to lead to higher net profits for farmers and make market participation more desirable.

  The traders emphasized the difficulty of finding animal transports to the markets. Transports are seldom inspected, and hence the transports are often too crowded. Occasionally people are transported together with the animals with risk for zoonotic disease spread. At the markets there is no waste management system, which enables animals to come into contact with substances, such as blood and offal, that are potential carriers of disease. In addition, there is lack of a system to prevent live animals from leaving small livestock markets where all animals are intended to be slaughtered. This increases risk for disease spread. Also, there is severe scarcity of formal small ruminant abattoirs in Zambia where ante- and post-mortem inspection is performed. Insufficient control at slaughterhouses increases the risk of foodborne disease cases in humans.

- **Underprioritized sector**
  Goat and sheep production was considered an underprioritized sector, both by farmers and by policy makers. Farmers tend to keep small ruminants as a side activity and not as a business enterprise. In addition, there is poor political will to invest in goat production and to improve goat health. Also, research tends to focus on larger livestock instead of small ruminants, contributing to poor knowledge of best practice.

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