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TECHNICAL BULLETIN No.5
FEEDING MANAGEMENT OF SHEEP
AND GOATS



ESGPIP

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FOREWORD

This Technical Bulletin No.5 titled “*Feeding management of sheep and goats*” is produced by the Ethiopia Sheep and Goat Productivity Improvement Program (ESGPIP). The ESGPIP is a USAID funded Project with the goal of improving the productivity of Ethiopia’s sheep and goats and consequently the livelihoods of the population.

One of the ways to optimize sheep and goat production is through reducing the wastage of feed resources and improving feed utilization. This fact sheet is intended to serve as an extension aid for Kebele Development Agents (KDA’s) to promote proper management of available feed resources. It is believed that the information contained in this Technical Bulletin is useful for sheep and goat producers at all levels of production.

At this juncture, I would like to thank all those involved in the preparation and review of this technical Bulletin.

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Chief of Party
ESGPIP
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FEEDING MANAGEMENT OF SHEEP AND GOATS

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1. What is feeding management?

The nutrition of sheep and goat feeding is a science. It is also an art in that experience and taking adequate consideration of the management of the feeding process have important implications in the effectiveness of sheep and goat feeding. All types of feed should be stored and used as carefully and economically as possible. Therefore, proper care should be taken during storage and handling to avoid spoilage and loss; in feeding techniques and livestock management to avoid wastage; and in ensuring that different types of feeds are used in the context of a balanced feeding system. Some principles and applications of feeding management of sheep and goats are presented below.

2. Recommended methods of feed and feeding management

Improving feed utilization efficiency:

- If sheep and goats are to make the best use of feed, they must be healthy and correctly handled. Routine control of epizootic diseases and internal and external parasites is important to achieve efficient use of feedstuffs;
- Feed animals based on their requirements. Both overfeeding and underfeeding result in feed wastage;

Proper storage of feed

Stored feed must be kept dry and protected from animals, moisture and fire. Do the following to protect feed from spoilage:

- Cover hay stacks: thatching or covering with other material;
- Store feed in a well-ventilated area to avoid mold development and excessive heating;
- Store feeds especially concentrates on pallets to avoid direct contact with the floor;
- Do not buy concentrate feeds in quantities more than what is required for one month;
- If possible, concentrate feeds should be stored as individual ingredients. Mixing should be in quantities that can be used in a one-week period. Mixed feeds spoil faster.
- Baled fodder is simpler to handle and requires less storage space compared with loose fodder. It is, therefore, advisable to bale roughages. Baling can be done on small farms without requiring expensive equipment using a box baler as shown in technical bulletin No. 6.

Adapting sheep and goats to new feeds and increasing consumption of less palatable feeds

- Sudden diet changes, especially switching from a diet high in roughage to concentrate, should be avoided. Diet changes should be gradual. The microorganisms in the reticulo-rumen that help sheep and goats utilize feed require time for adaptation. The sudden introduction of a new feed can lead to scouring and loss of condition or even death in severe cases. A new feed or a feed that is not highly palatable should first be given in very small amounts with the quantity being increased progressively over a period of days. There are, for example, observations that sheep and goats can initially refuse to consume some multipurpose trees and other feeds that have strong odor. Some suggestions for use of new feeds are given below:
 - Always present the new feed when animals are hungry.
 - Mix new or less palatable feed with feeds the animals already like to consume. The level of the new feed can be increased gradually. Mixing with feeds such as molasses or salt can shorten the adaptation period.
 - If the above strategies do not work, you can try forcing the animals to eat the new feed or go hungry by depriving it of an alternative feed. If they are persistent in their refusal, another approach or a different feedstuff may need to be used.

Separate feeding and/or grazing

- It is common for all classes of sheep and goats to graze together on communal land. This does not allow for feeding different classes of animals differently. For example, pregnant or lactating females should be fed differently than breeding males that should receive a maintenance diet.
- Individual animals within groups of sheep or goats differ in their nutritional needs. When feed resources are limited, animals with highest requirements should be targeted. For example, young stock and pregnant females have special needs and should be treated differently from other animals. Young lambs and kids need additional feed supplementation especially if they are born as twins or triplets. This can be done by using creep feeders that only allow access to supplement by young animals.

Presentation of feed

- Little attention is given to the method of presentation of feed in improving feed intake and feed utilization. It has a crucial role in terms of its effect on the amount of feed eaten as well as the amount wasted. Sheep like to graze while goats like to browse. Raising the feed offered to goats high over the ground and simulating a browsing situation may stimulate feeding behaviour. It will also help keep the feed clean and reduce wastage.

Feeding based on palatability

- If a feed has high nutritive value, but low palatability, its dry matter intake will be low. Where farmers cut and carry forage of different species, it is important to know the ranking of forage palatability. Some farmers are aware of this fact and make use of forage ranking effectively. They do this by offering the forage of the lowest palatability first and that with highest palatability last.

Provide fresh feed

- Supplying fresh feed at smaller quantities more often will help to stimulate consumption compared with offering larger amounts at one time.

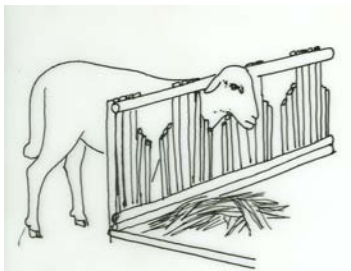
Minimize wastage

- *Sanitation:* Under confined or tethered feeding situations, a clean and dry floor will result in less wastage. Feed that falls to a clean floor is more likely to be acceptable if offered again than feed contaminated by mud and faeces. Sheep and goats are selective feeders and easily refuse to eat dirty or smelly feed. Feed that is refused by sheep and goats may in most instances be used for cattle that are generally less selective. This is one way of effectively utilising available feed resources
- *Chopping:* Feeding roughages in chopped form reduces wastage and improves feed utilization. Chopping green feed and stover has the following advantages:
 - Reduces selectivity;
 - Permits thick-stemmed material to be easily eaten;
 - Increases consumption of unpalatable feeds;
 - Allows for mixing with other ration components;
 - Uneaten, coarse bits of chopped fodder may be added to dung cakes and so are used as fuel.
- *Poor feeding techniques:*
 - When dry fodder is fed loose in the field, wastage will be less if distributed little by little so that the stock eat it all and wait for more;
 - Long hay and straw should be fed from racks or mangers; feeding off the ground, apart from being wasteful, is a health hazard.

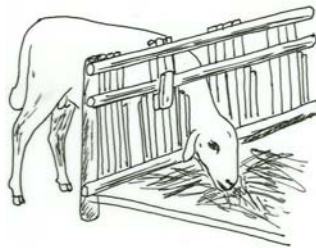
Provide appropriate feeders:

- Feeding on the ground results in considerable feed wastage and contributes greatly to the spread of disease, especially internal parasites. If sheep and goats are able to stand in their feed or in their feeders, they will inevitably defecate and urinate in the feed. Feeders need to be raised off the ground and constructed in such a way to keep the animals out as much as possible. Provision of appropriate feeders also reduces competition. There must be enough space at the feeder for all sheep and goats to be fed easily without fighting. Young animals should be fed separately from older ones to avoid competition and trampling.

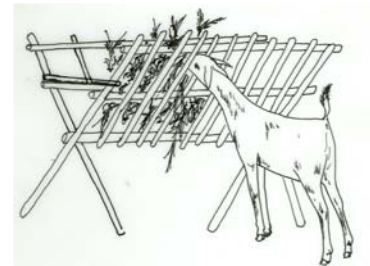
- **Feed racks:** Hay, crop residues and cut green forage can most easily be fed in racks made with slatted sides and hung at approximately head height.
 - Galvanized metal racks are more durable than those made from wood or bamboo but are more expensive.
 - The rack should be high enough for the animals to reach up and pull the feed down but not hung too high up. If animals are constantly reaching up to get at the hay, dust and particles from the hay will get into their eyes, and the irritation caused by the sharp particles can result in an unpleasant condition called "Red Eye."
 - The rack can be constructed as a mobile free standing structure or attached to a wall for support. Portable mobile racks can be used for field feeding.
 - Width between slats is dependent upon the form of feed fed.
 - There should be enough feeder space for all animals to eat at the same time with 25 to 30 cm allotted per adult animal. Providing several feed racks is a good solution.
 - Placing a tray or another rack underneath will help to catch feed that falls through and prevent it from becoming contaminated on the ground.
 - Feed animals in small groups to reduce competition.



A "keyhole" barrier made of wood.



A "tombstone" barrier made of wood.



Raised hay rack to simulate feeding habit of goats made of wood.

Figure 1. Different types of barriers and racks that reduce wastage



A hay rack made of wood.



A different make of rack.



Hay rack made of metal. National Animal Health Research Center, Sebeta.

Figure 2. Different types of hay racks

- **Feed troughs:**

- Finely chopped feeds and dry concentrate supplements should be fed in troughs.
- Wet feeds should be fed in buckets or other waterproof containers.
- Raising feeding troughs off the floor will minimize spillage and contamination by mud, feces and urine and prevent sheep and goats from stepping into the feeder.
- There are various designs for feeding troughs. U-shaped feeders are easier to clean than feeders with square bottoms. Metal or hard plastic pans or containers are useful for hand feeding small numbers of animals. Old car tires cut in half can also be used.
- Trough space of 25 to 30 cm per animal is a minimum requirement. When only a limited amount of supplementary feed is given, it is essential that the trough is long enough to allow all animals to eat at once.
- Troughs should be movable and are usually 2 to 4 m long. Suggested dimensions for a concentrate trough is 30 cm wide with sides 15 cm high and standing on 15 cm legs.
- The feeding behaviour of goats is different from that of sheep and a barrier is needed to prevent goats from jumping into the trough. In a system called ‘tombstone or keyhole barrier,’ each animal puts its head through an individual wooden barrier to eat without being able to push its body into the trough.
- Some troughs are fitted with a yoke to restrain animals during the short period of supplementary feeding. Such structures allow individual recording of the amount of concentrate consumed by an animal.



A feeding trough made from a hollowed out log.



Trough made of metal sheet.



Trough made from a half-cut barrel.



Trough made of PVC pipe used for feeding salt.

Figure 3. Different types of feeding troughs

- **Feed racks and troughs placed on grazing areas should be:**

- Placed on hard ground or on a well-drained part of the field.
- Shifted regularly to reduce damage to the ground and soil.

- Provide adequate space for all animals to eat easily without fighting. Young animals should be fed separately from older ones to avoid competition and trampling.
- Situated in the shade. An animal's appetite will be depressed if the place where they are fed is hot and exposed to the sun. They will eat more in a cool and shady place than in a place exposed to direct sunlight.

3. Summary

Improper feeding of available feed resources is one of the problems in the traditional sheep and goat production system. The system is wasteful in that a substantial proportion of feed is spoiled and/or wasted. Proper feeding management is necessary to increase the efficiency of feed utilization. Simple methods that can be implemented using already available resources and skill are described in this bulletin.

The Ethiopia Sheep and Goat Productivity Improvement Program (ESGPIP)

The Ethiopia Sheep and Goat Productivity Improvement Program (ESGPIP) is a USAID funded project operating with a goal to sustainably increase sheep and goat productivity in Ethiopia to consequently enhance economic and food securities. This will be achieved by addressing a large number of factors, including human and institutional capacity building, applied research and technology transfer and introduction of improved genotypes. The implementing institutions are the Prairie View A&M University (PVAMU), Prairie View, Texas and Langston University (LU), Langston, Oklahoma in collaboration with the Ministry of Agriculture and Rural development and other national and regional governmental institutions in Ethiopia. The project operates in six regions of Ethiopia namely Afar, Amhara, Oromia, Somali, Southern nations Nationalities and People's Regional state (SNNPRS) and Tigray. Project objectives will be attained through:

- Establishing a training program to upgrade knowledge of Kebele development Agents (KDAs) for more effective training of sheep and goat producers;
- Increasing effective use of available by-product feedstuffs to overcome shortages of feedstuffs for sheep and goats and elevate animal performance;
- Increasing employment of preferable alternative management practices for sheep and goats; and
- Introducing and evaluating improved genotypes of sheep and goats to elevate meat production and associated economic returns.