

Problems in making hay

- Under sub-humid and humid temperature, slowness of drying can occur. To avoid loss due to spoilage, the aim is to dry the pasture as quickly as conditions will allow.
- Under hot, dry conditions, there is breaking of the finer parts of the plant, through rapid drying, or loosing colour, which leads to loss of nutrients (carotene and vitamins).

Losses in haymaking

- Fermentation - Begins as soon as the crop is cut. Bacteria and moulds on the crop surface cause losses, with generation of heat. The solution is prompt and adequate turning must be done.
- Mechanical leaf loss occurs during turning, spreading out, collection, transportation and baling. The solution is gentle handling.
- Loss of water soluble nutrients if rain falls on the herbage during the drying process. Re-wetting of partially dried hay is more serious than rain on newly-cut herbage. The solution is that grass must be cut when you think that you have 3 to 5 days of sunny weather to dry the hay. Transfer the grass into shed as soon as rain is imminent.
- Spoilage in the bale due to poor storing with too high moisture content, poorly designed stacks which allow water in and do not allow some ventilation. Fermentation raises hay temperature which can result in burning. Mouldy hay will lead to poor intake or refusal by animals, and may contain mycotoxins.
- Wastage during utilisation - from open stacks and poor feeding technique (read technique of feeding hay)

Fire risks

Hay is easily set on fire, so care must be taken in siting stack-yards and storage so as to minimise the risks. Tide up loose hay which could carry fire. Keep away source of fire. Spontaneous burning can occur when hay is stored at too high a moisture content.



Grazing animals in Karamoja during dry season



Grazing animals in Karamoja during wet season.



Animals feeding on hay on station during dry season

HAY PRODUCTION AND UTILISATION FOR DROUGHT RESILIENT LIVESTOCK PRODUCTION

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Hay feeding sustains herds through drought when there is less pasture availability to maintain condition. The hay harvested at the proper stage of plant growth and undamaged by weather provides nutrients at a minimal cost compared to other supplemental feeds.

Background

Uganda is facing challenges of prolonged droughts due to climatic variability. Climatic impacts are more severe in arid and semi-arid grazing systems where higher temperatures and lower rainfall reduce yields on rangelands and reduce pasture quality. There is need to promote hay-based diets for dry season feeding to enhance drought resilience with regard to livestock production.

Hay is grass, legumes, or other herbaceous plants that have been cut, dried, and stored to use as animal fodder when there is not enough pasture or rangeland on which to graze animals, particularly cattle, horses, goats, and sheep. Hay making turns green, perishable, forage into a product that can be utilised without danger of spoilage, while keeping losses of dry matter and nutrients to a minimum.

Source of hay

Hay can be made from natural pasture, sown pasture and crops specifically cultivated for conservation. With regard to sown pasture, *Chloris gayana* and herbaceous legumes (*Glycine*, lucerne and *Centrosema pubescens*) are valuable sources of hay (Figure 1). *Chloris gayana* is a vigorous perennial type, which is persistent, drought resistant, tolerant to pests and diseases, and is highly productive. Lucerne or alfalfa (*Medicago sativa*) is a deep-rooted, perennial pasture legume, with good drought tolerance and is well adapted for irregular rainfall patterns.



Figure 1: A *Chloris gayana* establishment on station.

The cutting and drying process

High quality hay is produced by cutting the pastures when half of the plants have flowered (Figure 2). For grass, the quality drops rapidly with maturity, especially after flowering. Cereals for hay are cut at a more mature stage than pasture grasses, often when the grains are fully formed. Cutting can be done with a sickle or with a machine, mower conditioner.

Drying should be done as quickly as possible to minimise losses (Figure 2). It usually takes 3 to 4 days for the hay to dry properly. At cutting, pasture will contain between 70 and 90% of moisture, and this will have to be reduced before the hay can be stored safely. Twenty-five (25%) moisture is recommended as a maximum for long loose hay; 20% for chopped hay and 5% for pelleted, cured hay.



Figure 2: Cutting and drying of grass for haymaking

The dried hay is baled using a box with dimensions of 90 cm length, 36 cm width and 46 cm depth and strings. The box is filled with dried hay then tightly packed and tied with strings on both ends. The box is then lifted to release the bale, weighing 15 to 25 kg. Baling is done by tying with a rope.



Figure 3: Baling of dried hay using a box and strings

Storage

Hay can be kept for long periods if properly made and correctly stored. Storage should be under a shelter with a dry foundation throughout the year.

Feeding of hay in animals

Hay quality, weather conditions, cow age, stage of production, feeding methods, hay wastage, and type of bale feeder can influence intake. Generally, a cow consumes 2.0% of its body weight. Therefore, a 240 kg cow will consume 4.8 kgs of hay assuming the hay is of good quality and has about 8% crude protein. The amount of hay fed to an animal must be monitored so that animals do not get too fat or too thin. Animals that eat spoiled hay may develop illness.

Benefits from haymaking

Feeding hay to short-horned East African Zebu (SEAZ) of Karamoja in the dry season increases milk production by at least 50% (from 2 litres to 4 litres per cow per day) and body weight change increases by 300% (from -5 kg gain to +10 kg gain per month). Hay production can improve the incomes of communities.

It costs about 900,000 Uganda shillings (UGX) to establish and harvest one acre of pastures for hay, including the hay making process; returning 1,750,000 UGX.