

# HOW TO CONSERVE FODDER

Fodders and grasses can be preserved either as hay (dried fodder) or as silage (wet fodder), depending on weather conditions and available resources. The volume of pasture and fodder production depends on rainfall distribution. Excess can and should be conserved for use in times of scarcity.

## Hay making

Hay is conserved by drying it, to reduce water content so it can be stored without rotting.

- Moisture content should be reduced to about 15%. Not all grasses and fodder are suitable for haymaking.

## Steps for making hay

### 1. Harvesting and curing

- Fodder for haymaking is harvested when the crop attains 50% flowering. At this stage protein and digestibility are at their maximum.
- Fodder should be harvested after 2-3 days of dry weather so drying is possible.
- Drying should be done under shade (if possible) so dried fodder retains its green colour. This is an indicator of quality.
- Ensure the fodder dries evenly.
- Check the dryness by trying to break the stem. If it bends too much without breaking, there is still too much water.
- Legumes and grasses can be mixed to make better-quality hay, e.g. Rhodes grass and Lucerne.

### 2. Baling hay

- Baling can be done manually or mechanically. Manual baling is cheaper for small-scale dairy farmers.
- Baling allows more material to be stored in a given space.
- Manual hay baling, shown in Figure 1 below, is done using a baling box with dimensions 85 cm x 55 cm x 45 cm, open on both ends. If the hay is well pressed, the box will produce an average bale of 20 kg.
- Hay can also be stored without baling by heaping it into a dome-shaped stack and covering it with a polythene sheet or a tarpaulin.

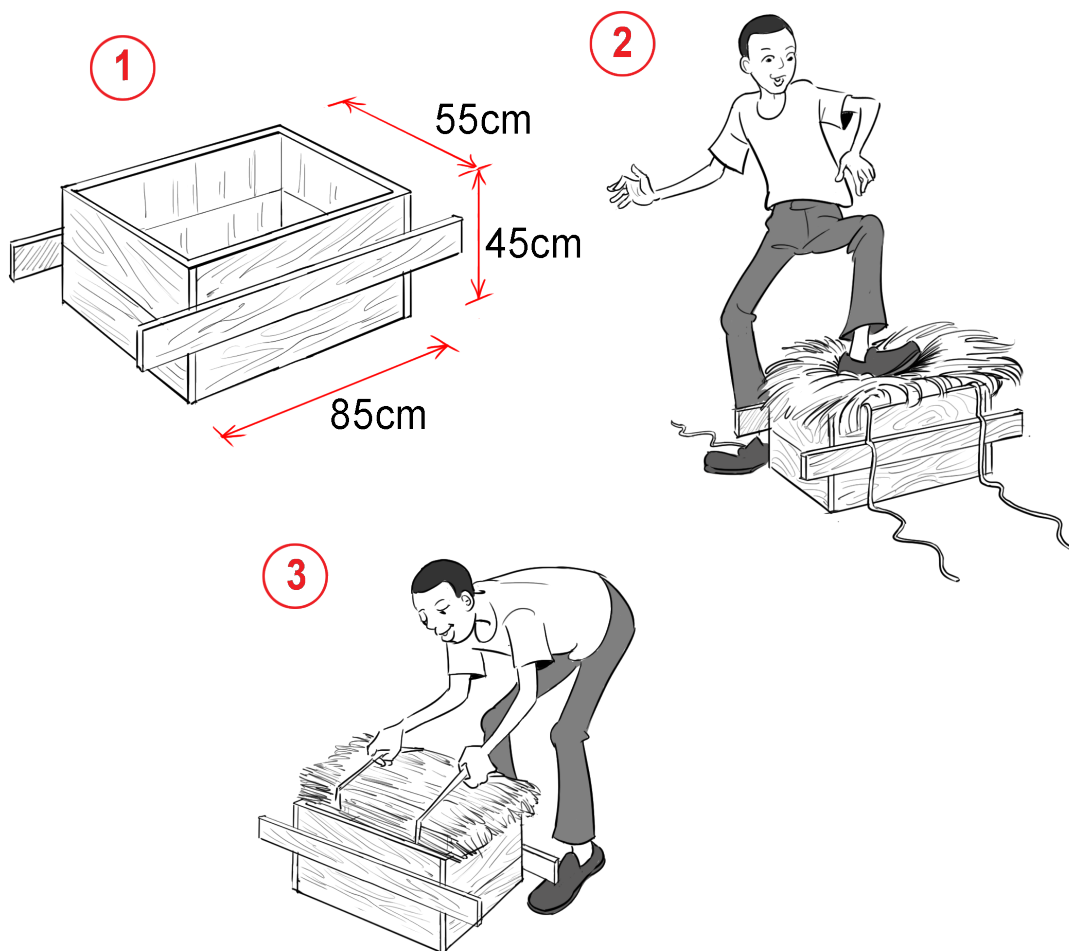


Figure 1: How to perform manual baling.

### 3. Storing hay

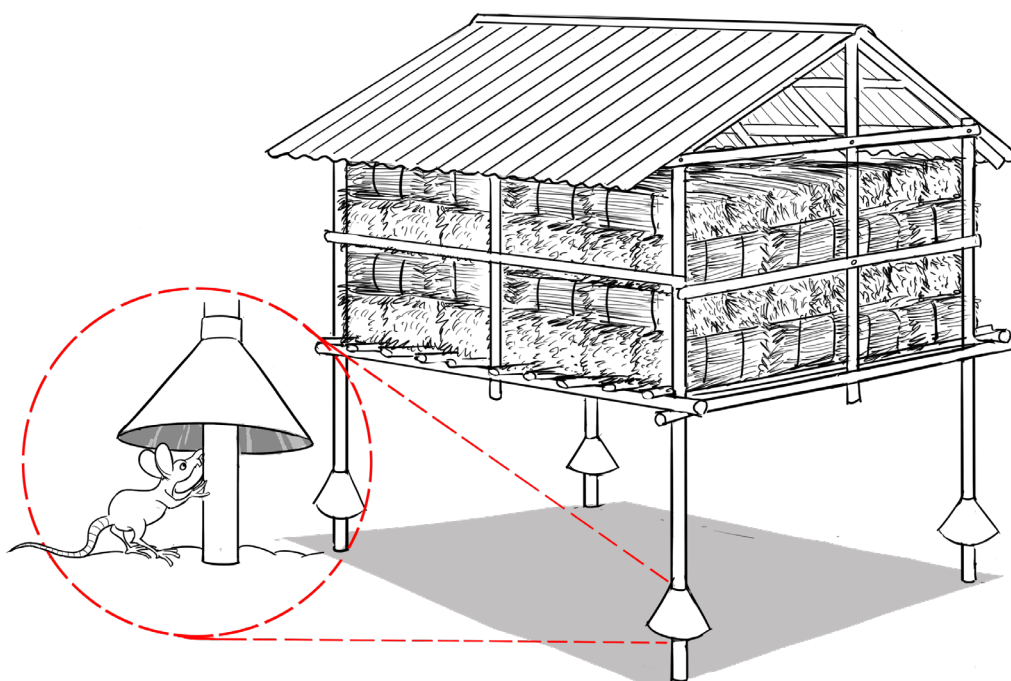


Figure 2: Store hay in a sheltered enclosure

## Characteristics of good quality hay

The quality of the hay should be clear to see. Good-quality hay should

- Be leafy and greenish in colour.
- Have no foreign material mixed with it.
- Have no smell.

## Silage making

- Silage is fodder packed in airtight conditions to preserve its nutritional value, improve its quality and taste and to make it easy to digest.
- Preparation of good quality silage depends on timely harvesting of fodder, the quantity of air in it at the time of packing and the preservation method.

## Appropriate fodder for silage

An ideal crop for silage making should:

- Contain an adequate level of fermentable sugars in the form of water-soluble carbohydrates.
- Have a dry matter content in the fresh crop of above 20%.
- Possess a physical structure that will allow it to compact readily in the silo after harvesting.

Crops not fulfilling these requirements may require pre-treatment such as:

- Field wilting, to reduce moisture.
- Fine chopping to a length of 2–2.5 cm to allow compaction.
- Use of additives, to increase soluble carbohydrates.

## Steps for making silage

### Step 1: Harvesting

- Determine the right time for harvesting fodder to get the best nutritional value from silage.
- The right time to harvest fodder for silage is as follows for some main crop types.
- Napier grass should be harvested when it is about 0.8 - 1m high and its protein content is about 10%. When ensiling Napier grass, add molasses to increase the sugar content.
- Maize and sorghum should be harvested at dough stage, that is, when the grain is milky. At this stage, maize and sorghum grains have enough water-soluble sugars so it is not necessary to add molasses when ensiling. The best time to harvest maize is when its grains are 50 percent milky.
- The best time to harvest the leguminous fodders is when half their flowers are in bloom.
- The best time to harvest green fodder for silage is when its moisture content is 65-70%.

### Step 2: Chopping

- Fodder can be chopped with a common fodder chopper, but an electric chopper or the tractor's shaft can hasten the chopping process, which results in better quality silage.
- 2 – 3 cms size of the chopped fodder is considered suitable for silage.
- Care should be taken to keep the loss of fodder to the minimum during chopping.

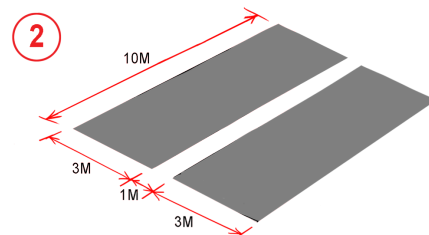
### Step 3: Ensiling

- Chopped fodder should be pressed and stored as soon as possible to maintain its nutritional value.
- Chopped fodder can be stored in a pit on a comparatively higher ground or on the surface with or material or in a tube.
- The storage place should be near the animal shed and on higher ground, to protect it from water.
- The whole process of silage making – harvesting, chopping, pressing and packing – should be completed within 16 to 20 hours.

### Surface silage



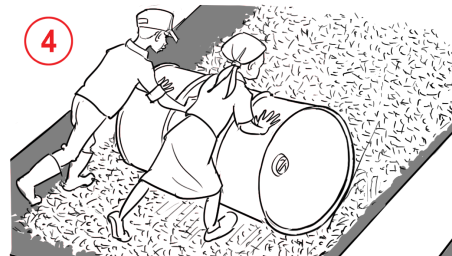
Chop forage to about 2 - 3 cm.



Place two pieces of plastic (polythene) sheeting (each about 10m long, 3 m wide, 500 gauge) beside each other on flat ground, leaving a space of 1m in between.

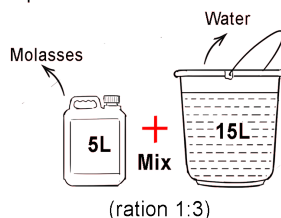


Place a 15-30 cm layer of chopped material on one end of the plastic, towards the center. If the plastic is on a sloping ground, the material should be placed on the lower side of the slope.



Compact material by rolling over it with a 200 liter drum filled with water. (other heavy object may also be used).

Dilute 5 liters of molasses with 15 liters of water (ratio 1:3) and sprinkle evenly onto the material to help speed up the preservation process.



Add another 15-30 cm layer of chopped material, then compact and add molasses. Repeat this process until all material is used.



Fold the plastic sheets over the material to cover it completely, starting with the longer sides. If needed, add extra plastic. The shorter side, when closed, should allow for easy opening while feeding.

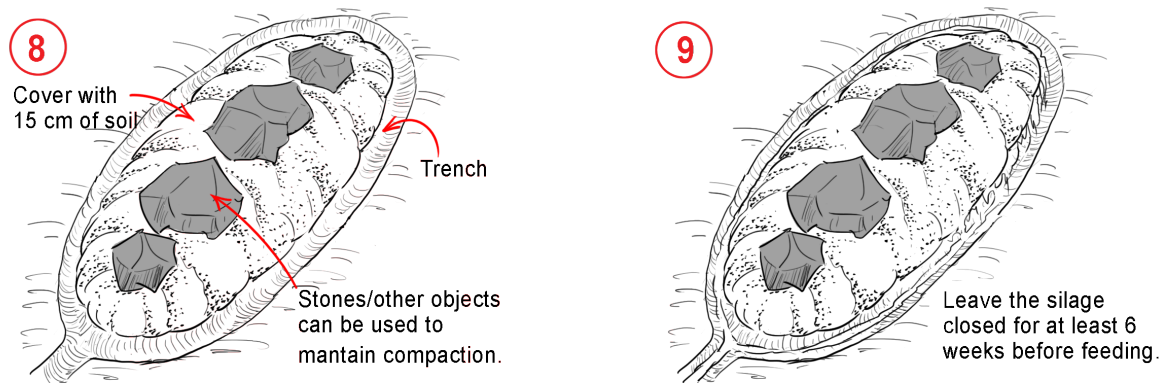


Figure 3: Steps for creating above ground silage.

## Tube silage

- Chop the wilted material to be ensiled into pieces not more than 2.5 cm long.
- Sprinkle the chopped material with a molasses and water mixture; for every sack use 1 litre of molasses mixed with 2–3 times as much water. This is especially for material like Napier grass that has low sugar content. Maize bran or cassava flour can be added to improve the carbohydrate (energy) content.
- Place the chopped material, sprinkled with the molasses and water mixture, into the plastic tubing (1000 gauge) with a width of 1.5 m. Cut a 2.5m length, tie off one end and fill with the material, compressing it well, then tie the other end to seal. Stack the filled sacks until needed. Fermentation is usually complete after 21 days.

- ① Chop the fodder into small pieces.



- ③ Sprinkle the chopped material with a molasses and water mixture.



- ② Place the chopped material, sprinkled with the molasses and water mixture, into the plastic tubing.



- ④ Pack the silage carefully to protect it from air and water.



Figure 4: How to make silage. (Source: Lukuyu et al., 2012)

## How to store silage

- Tube silage should be stored under shade, for example in a store. Rodents that could tear the tube need to be controlled.
- When feeding, open the tube and scoop a layer and remember to re-tie or cover without trapping air inside.
- Drainage from the top should be guided to avoid rainwater draining into the pit.
- When feeding from the above-ground method, open from the lower side of the slope, remove the amount you need for the day and re-cover it without trapping air inside.
- To avoid off-flavours in milk, feed silage to milking cows after milking, not before, or feed at least 2 hours before milking.