Theme 2: Forage conservation

FORAGE CONSERVATION AND STORAGE (Level 1)

Topic	Training & information Content
2.1	Fodder conservation and storage
2.2	Estimating ideal time of harvesting
2.3	Guideline for silage making
2.4	Fermentation process
2.5	Treatment of straw with Urea
2.6	Making of urea/molasses/mineral lick
2.7	Management of silage pit (feed out)
2.8	Estimating fodder supplies for dry season feeding & planning of feeding management

1. You will learn about (learning objectives):

- To conserve and store forages to preserve the nutritive value of the feed and avoid spoilage, appropriate practices, preparation of storage facilities and avoid storage losses
  - Hay
  - Haylage
  - Silage

Wrapping - haylage

2. Why conserve forages?

- Offers extra feed supplement to the ration
- Helps store excess forage for future use
- Preserves nutritive value of forage for longer period
- Provides consistent balanced diet
- Assists with feed planning

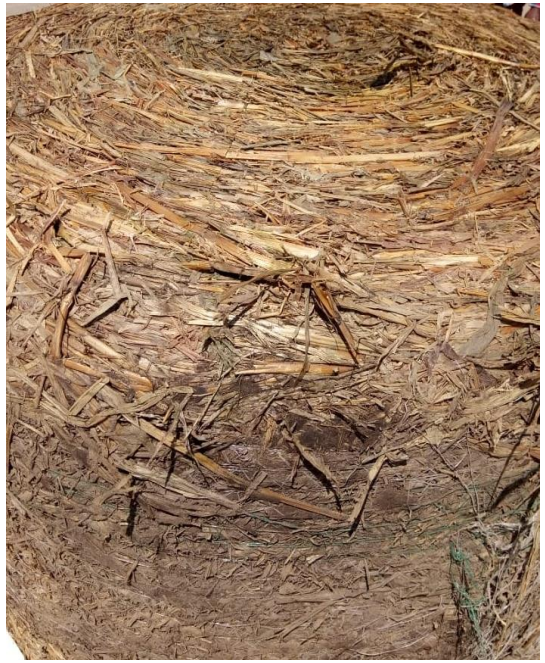
3. Factors affecting the quantity and quality of conserved forages

- Forage species - resistant and fast growing species allow for numerous harvests
- Leafiness
- Maturity stage
- Harvesting technique
- Climate - right conditions (temperature)
- Foreign matter - Avoid unwanted materials
- Storage - poorly made facilities cause losses

4. Methods of forage conservation

- Methods include:
  1. Drying (hay)
  2. Fermentation (silage & haylage)
  3. Dehydration (artificial drying / pelleting)



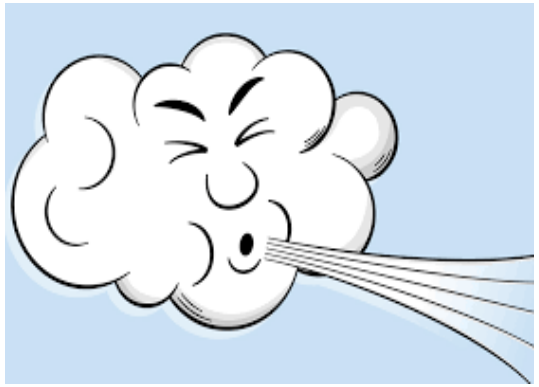


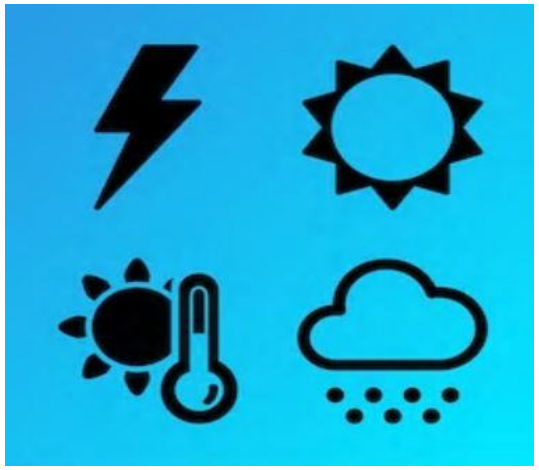

5. Drying grass (wilting) to hay

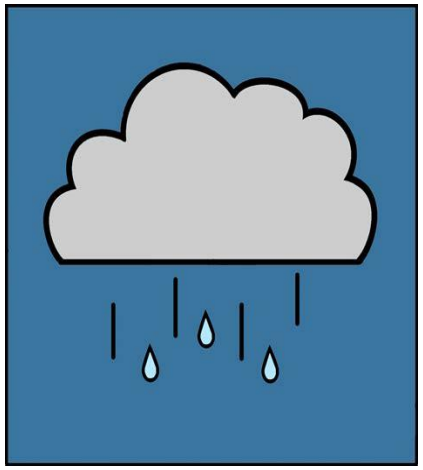
- Haymaking helps produce a stable, high-quality animal feed
- Grazing is more ideal than making hay
- Harvest and dry the forage (grass, legume or mixed hay) wisely and store them properly

6. When to make hay

- Weather forecasts will assist to identify the ideal time of harvest
- Harvesting should be done when there is a likelihood of several days of good haymaking weather







7. Guidelines for drying hay

- Turn the grass (tedding)
- Dry for 5 – 7 days in the field
- Rake the grass together in straight lines
- Start baling. Compact thoroughly
- Store the bales in a dry and secure area
- Well managed pasture, receiving enough rainfall, can be cut every 6-8 weeks

Compacting hay

8. Storing dry grass (hay)

- Storage may be done
  - as long hay
  - chopped hay
  - baled hay (rectangular, big bales, round bales)

9. Considerations when storing hay

- Bale hay at lower dry matter content (below 80%) to avoid moulding and heating
- Hay stored outside is affected by higher storage losses compared to hay kept in a store

How to make silage: *See module 2.3 Guidelines on silage making & module 2.4 Fermentation process*

10. Methods of storing silage

- Most common methods include:
  - hillside pits
  - above ground bunkers (clamp)
  - in ground pits or trenches
  - stack and bale silage

11. Size and shape of silage storage

- Long, deep, narrow pits are preferred over short, wide, shallow storages
- Rate of removal should be to a depth of at least 15 cm/day, increasing to 30 cm/day for unstable silages such as maize

12. Storage facilities for small holder silage

Silo sizes for small holders

- For properly compacted chopped forage material weighing 350 kg in a silo
  - 1 m^3 (1×1×1 m): for one animal taking 10 kg silage/day
  - 2 m^3 (2×1×1 m): for one animal taking 20 kg silage/day

Silo

13. Dehydration – pelleting/artificial drying

- Dehydration involves removal of moisture (water) from feeds
- Drying can be done manually by small scale farmers
- For pelleting a feed pellet machine will be required.

14. Reasons for storing forages

- Create reserve for the dry season
- Utilize excess forage during rainy season
- Protect against climatic factors
- Avoid deterioration and spoilage caused by:
  - Water and heat
  - Pests and insects
  - Fungal invasion
  - Chemical damages

15. Storing pellets

- They are mostly stored in eithers bales or bags

16. Aspects of a good storage facility for forage

- Properly constructed
- Adequate space
- Easily accessible
- Location - close to the cows feeding area
- Secure

17. Take home messages: Storing hay

1. Dry feeds are easier to store and maintain quality compared to wet feed
2. Mostly stored in either (hay) bales or sacks
3. Ensure dry matter content during hay baling is above 80%
4. Hay stored outside suffer higher storage losses compared to hay kept in a store.

Watch video:
https://www.youtube.com/watch?v=ZrpM05PSAVw&t=22s

18. Take home messages: Storing silage

1. Pit design - narrow pits makes it easier to maintain feeding speed
2. Contamination - avoid unwanted materials
3. Type of sealing - polythene used should be new and strong
4. Compaction - Compact heavily
5. Covering - add weight on top of silage
6. Feed face and silage handling - remove all loose silage material
7. Feeding speed - feed as fast as possible (at least 15 cm/day, increasing to 30 cm/day)

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