Grade 9 Agriculture and Nutrition

CBC NOTES | Terms 1, 2 and 3 - notes for 10 topics

IN EVERY TOPIC

- What you will learn, the key words and key terms explained.
- Clear notes under headings and subheadings, with labelled pictures and step-by-step procedures.
- Comparison tables, and advantages and disadvantages where methods are compared.
- Key points to remember, then multiple-choice and structured questions.
- All the answers and a glossary at the back.

TOPICS IN THESE NOTES

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A TASTE OF THE FIRST TOPIC

Conserving Animal Feed: Hay

In Kenya the dry season and droughts leave pasture dry and scarce. Animals lose weight, give less milk and may die, and herders travel far, sometimes into conflict over grazing. Conserving forage means keeping surplus feed from the rainy season for the dry season, so animals stay healthy and families keep their income.

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Strand 1.0 Conservation of Resources | Term 1

1.1 Conserving Animal Feed: Hay

WHAT YOU WILL LEARN

By the end of this topic you should be able to:

- describe methods of conserving forage in coping with drought
- conserve forage to cope with drought
- adopt conservation of forage in coping with drought

KEY WORDS

forage, hay, standing forage, stacking, box baling, maize stover, straw, drought.

In Kenya the dry season and droughts leave pasture dry and scarce. Animals lose weight, give less milk and may die, and herders travel far, sometimes into conflict over grazing. Conserving forage means keeping surplus feed from the rainy season for the dry season, so animals stay healthy and families keep their income.

1. Forage and why we conserve it

Forage
Plant material eaten by livestock, such as grasses, legumes and crop residues (maize stover and straw).

Forage conservation
Storing surplus forage from the wet season so it can be fed to animals in the dry season or during drought.

Effects of drought on livestock

- Animals lose weight and body condition.
- Milk yield falls, so families earn less.
- Weak animals fall sick more easily and some die.
- Herders move long distances in search of pasture, which can cause conflict with other communities.

Why conserving forage matters

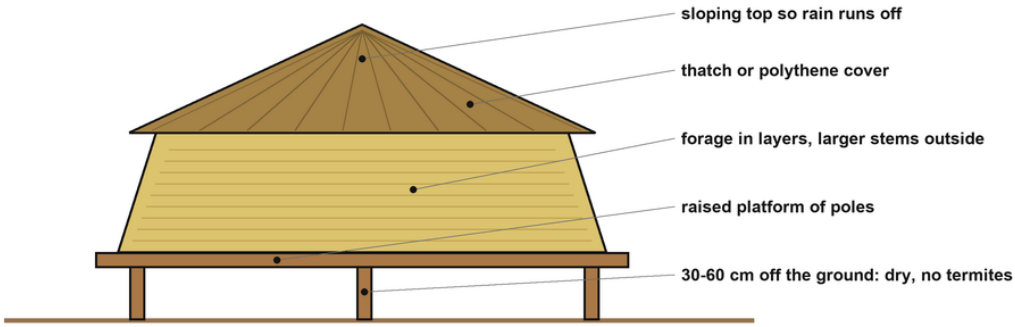
- Animals survive the dry season and keep producing milk and meat.
- It reduces disaster risk: conserved feed saves animals in a drought.
- It promotes peace, because herders do not compete for scarce pasture.
- It uses crop residues such as maize stover and straw that would otherwise be wasted.

2. Methods of conserving forage

The KICD design names three main ways of conserving forage: baled hay making, standing forage and stacking.

Comparing the three methods

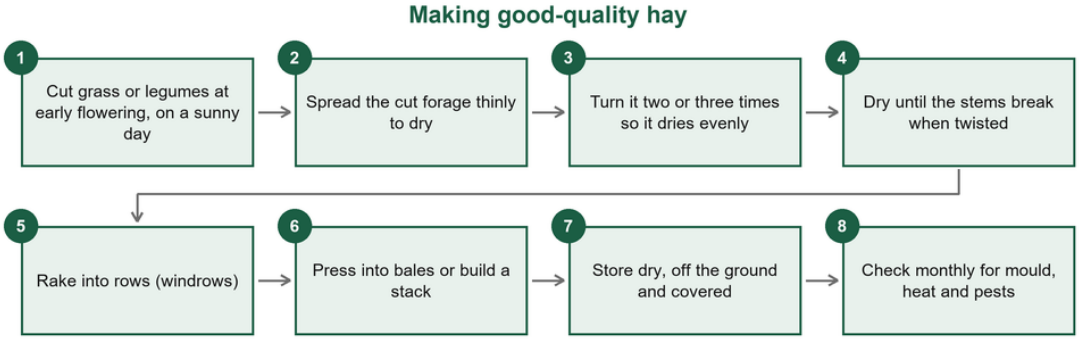
Feature	Baled hay	Standing forage	Stacking
What it is	Grass or legumes cut, dried and pressed into bales	Pasture fenced off at the end of the rains and left uncut to be grazed later	Dried forage or crop residues piled in layers on a raised platform and covered
Materials	Grass, legumes, straw; baling box and twine	A field of good grass, fencing	Maize stover, straw, dry grass; poles; thatch or polythene
Labour	High: cutting, drying, baling	Low: fencing only	Medium: carrying and building
Quality of feed	Good if cut at early flowering and dried well	Falls as the grass dries in the field	Fair; depends on the residue used
Storage and transport	Easy to store, count and transport	No storage needed; cannot be moved	Stays where it is built



A forage stack on a raised platform, with a sloping cover to shed rain

3. Making good-quality hay

Hay
Grass or legumes cut and dried until the moisture is low enough for safe storage.



The steps in making good-quality hay

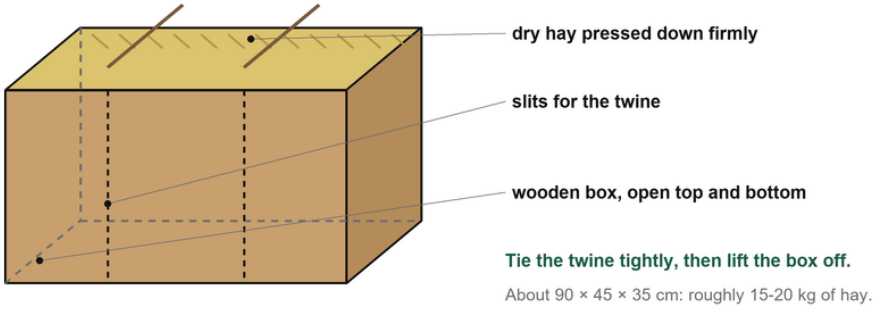
DID YOU KNOW?
Grass cut at early flowering has the most leaves and nutrients. Older grass is stemmy and poor; rain on cut hay washes out nutrients and causes mould.

How to tell that hay is dry enough

- The stems break, rather than bend, when twisted.
- The hay is crisp and greenish, not black or mouldy.
- It smells sweet, not musty.

4. Box baling

A baling box is a wooden box, open at the top and bottom, with slits for twine. It presses loose hay or crop residues into a firm block that is easy to store and carry.



A baling box

Steps in box baling

1. Lay two lengths of twine through the slits along the bottom of the box.
2. Fill the box with dry hay, maize stover or straw.
3. Press the forage down firmly (step on it), then add more and press again.
4. When the box is full and firm, tie the twine tightly over the top.
5. Lift the box off the bale.
6. Label the bale with the type of forage and the date.

> **Planning hay for the dry season**
> A 400 kg dairy cow needs about 10 kg of hay a day.
> For 30 days of drought: 10 kg × 30 = 300 kg of hay.
> A box bale holds about 15 to 20 kg, so the farmer needs about 15 to 20 bales for that cow.

5. Stacking and standing forage

Building a stack

1. Build a platform of poles about 30 to 60 cm above the ground.
2. Lay the dry forage in layers, with the larger stems on the outside.
3. Make the top slope so rain runs off.
4. Cover with thatch or polythene.

Standing forage

+ Advantages	- Disadvantages
• No cutting, drying or storage costs. • Little labour: the field only needs fencing. • Animals feed themselves by grazing.	• Feed quality falls as the grass dries. • Risk of fire, and of theft or stray animals. • The land cannot be used for anything else meanwhile.

GOOD PRACTICE

Graze standing forage section by section so that it lasts through the dry season.

6. Storing conserved forage and adopting it at home

- Store hay in a dry, airy shed or a covered stack, off the ground and away from fire.
- Check every month: a musty smell or a warm bale means moisture and mould.
- Never feed mouldy hay; it can make animals sick.

How a household can adopt forage conservation

- Keep crop residues (maize stover, bean haulms, straw) after harvest instead of burning them.
- Make box bales by hand; no machine is needed.
- Plant fodder such as Napier grass, Rhodes grass or lucerne.
- Share tools and labour in a farmer group.

KEY POINTS TO REMEMBER

- Forage conservation keeps wet-season feed for the dry season and drought.
- The main methods are baled hay making, standing forage and stacking.
- Cut hay at early flowering, dry it well and store it dry, off the ground and covered.
- A baling box presses forage into firm, easy-to-store bales.
- Conserved forage saves animals, keeps milk and income flowing and reduces conflict over pasture.

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CHECK YOURSELF: MULTIPLE CHOICE

Choose the correct answer: A, B, C or D. The answers are at the back.

1. Which of these is a crop residue that can be conserved as forage?
A. Napier grass
B. Maize stover
C. Lucerne
D. Rhodes grass

2. At which stage should grass be cut to make good-quality hay?
A. Just after germination
B. After the seeds have dropped
C. When the grass is completely dry
D. At early flowering

3. Why is cut grass turned two or three times while drying?
A. So that it dries evenly
B. To make it heavier
C. To add nutrients
D. To keep termites away

4. A herder fences off good pasture at the end of the rains and keeps animals out until the dry season. This is
A. box baling.
B. stacking.
C. standing forage.
D. hay making.

5. What should learners do FIRST when making a box bale?

A. Lay the twine through the slits
B. Tie the twine over the top
C. Lift the box off
D. Label the bale

6. Why is a forage stack built on a raised platform?

A. To let animals reach it
B. To make it dry faster in the rain
C. To make it look neat
D. To keep it dry and away from termites

7. A stored bale smells musty and feels warm inside. This shows that

A. it is ready to feed.
B. it was stored damp and is going mouldy.
C. it was cut too early.
D. the twine is too tight.

ANSWER THESE

1. State three effects of drought on livestock. (3 marks)

2. Give two advantages and two disadvantages of standing forage. (4 marks)

3. Describe the steps of making a box bale. (4 marks)

4. A farmer has two 400 kg cows. Each needs about 10 kg of hay a day. How much hay is needed for 45 days? (2 marks)

5. Explain how forage conservation promotes peace in pastoral areas. (2 marks)

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Strand 1.0 Conservation of Resources | Term 1

1.2 Conserving Leftover Foods

WHAT YOU WILL LEARN

By the end of this topic you should be able to:

- explain the importance of conserving leftover foods at home
- prepare leftover foods to avoid wastage
- embrace the use of leftover foods to avoid food wastage

KEY WORDS

leftover food, food wastage, reheating, refrigeration, contamination, spoilage.

Every day, good food is thrown away in Kenyan homes and schools. Leftover food is cooked food that remains after a meal. When it is stored and handled safely, it can be reheated or turned into a new dish, saving money, fuel and time and reducing waste.

1. Leftover food and food wastage

Leftover food

Cooked food that remains after a meal and can be eaten later.

Food wastage

Throwing away food that could have been eaten.

Importance of conserving leftover foods

- Saves money: food already paid for is not thrown away.
- Saves fuel and cooking time.
- Reduces hunger in the home.
- Reduces rotting waste, bad smells, flies and rats.
- Shows integrity: using resources carefully and respecting the work of farmers and cooks.

Foods that make good leftovers include rice, ugali, githeri, beans, stews, cooked vegetables and chapati.

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2. Storing leftovers safely



Keeping leftover food safe from the pot to the plate

FOOD SAFETY

Germs multiply fast in warm food. Cool leftovers quickly, keep them covered and eat them within about a day.