

UNIT 4
Dairy Farming
Providing Feed & Water for Livestock

Subject	Animal Husbandry & Dairying
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Medium	English Medium
Contents	20 MCQ 10 Fill in the Blanks 20 FAQ All Book Exercises Solved

SECTION A — Multiple Choice Questions (MCQs)

20 Questions | Each carries 1 mark

Q1. Why do dairy animals need feed?

- (a) Only for maintenance
- (b) Only for milk production
- (c) Only for growth
- (d) For maintenance, growth, lactation and pregnancy

Answer: (d) For maintenance, growth, lactation and pregnancy

Explanation: Animals need feed for all life functions — maintenance, growth, lactation, pregnancy, and work.

Q2. Feed costs constitute approximately what percentage of total dairy animal production cost?

- (a) 30%
- (b) 50%
- (c) 70%
- (d) 90%

Answer: (c) 70%

Explanation: Feed costs = approximately 70% of total cost of animal production.

Q3. Which of the following is NOT a characteristic of good animal feed?

- (a) Palatable
- (b) Economical
- (c) Rich in a single nutrient only
- (d) Free from toxins

Answer: (c) Rich in a single nutrient only

Explanation: Good feed must be balanced — not high in any single nutrient. Palatability, economy, and being toxin-free are essential qualities.

Q4. A feed is classified as 'Roughage' when Crude Fibre content is:

- (a) Less than 10%
- (b) Less than 18%
- (c) More than 18%
- (d) More than 30%

Answer: (c) More than 18%

Explanation: Roughage has CF > 18% and TDN < 60%. It is high in fibre and low in energy.

Q5. In the TDN formula, Digestible Ether Extract is multiplied by:

- (a) 1.5
- (b) 2.0
- (c) 2.25
- (d) 3.0

Answer: (c) 2.25

Explanation: Fats (EE) have 2.25 times more energy per unit weight compared to carbohydrates or proteins.

Q6. The Crude Protein content of feed is calculated using the formula:

- (a) $CP = N \times 6.25$
- (b) $CP = N \times 2.25$
- (c) $CP = EE \times 6.25$
- (d) $CP = TDN \times 16$

Answer: (a) $CP = N \times 6.25$

Explanation: Proteins contain approximately 16% nitrogen, so $CP = \text{Total Nitrogen} \times 6.25$ (since $100 \div 16 = 6.25$).

Q7. Which of the following is NOT part of Crude Protein?

- (a) Pure proteins
- (b) Amino acids
- (c) Non-protein nitrogen compounds
- (d) Cellulose

Answer: (d) Cellulose

Explanation: Cellulose is part of Crude Fibre (CF), not Crude Protein. CP includes pure proteins, amino acids, and NPN compounds.

Q8. Silage is categorised as which type of feed?

- (a) Concentrate
- (b) Roughage
- (c) Mineral supplement
- (d) Animal protein source

Answer: (b) Roughage

Explanation: Silage is fermented green fodder — it is a roughage with CF > 18% and high moisture content (~70-75%).

Q9. Daily Dry Matter requirement of crossbred cows and buffaloes is:

- (a) 1.0–1.5% of body weight
- (b) 2.0–2.5% of body weight
- (c) 2.5–3.0% of body weight
- (d) 4.0–5.0% of body weight

Answer: (c) 2.5–3.0% of body weight

Explanation: Indigenous breeds need 2.0–2.5% DM, while crossbred cows and buffaloes need 2.5–3.0% of body weight as DM.

Q10. As per the rule of thumb, concentrate required per litre of milk production is:

- (a) 0.2 kg
- (b) 0.4 kg
- (c) 0.6 kg
- (d) 1.0 kg

Answer: (b) 0.4 kg

Explanation: 0.4 kg of concentrate is required per litre of milk yield for dairy cattle and buffaloes.

Q11. Which of the following is a cereal used in concentrate mixture preparation?

- (a) Mustard cake
- (b) Fish meal
- (c) Sorghum
- (d) Di-calcium phosphate

Answer: (c) Sorghum

Explanation: Sorghum (Jowar) is a cereal. Mustard cake is an oil cake, fish meal is animal protein, and DCP is a mineral source.

Q12. Which is an agro-industry by-product used in concentrate mixture?

- (a) Groundnut cake
- (b) Rice polish
- (c) Blood meal
- (d) Limestone

Answer: (b) Rice polish

Explanation: Rice polish is an agro-industry by-product from rice milling. Groundnut cake is an oil cake, blood meal is animal protein.

Q13. The moisture content of stored feed should be less than:

- (a) 5%
- (b) 8%
- (c) 12%
- (d) 20%

Answer: (c) 12%

Explanation: Feed moisture must be kept below 12% during storage. Higher moisture leads to fungal growth and spoilage.

Q14. Which traditional storage structure is used for feed storage?

- (a) Improved bins
- (b) Mud bin
- (c) Metal silo
- (d) Brick godown

Answer: (b) Mud bin

Explanation: Mud bin is a traditional storage structure. Improved bins, silos, and brick godowns are modern/semi-modern structures.

Q15. In which form can concentrate mixture be offered to animals?

- (a) Mash only
- (b) Pellets only
- (c) Crumbles only
- (d) All of these

Answer: (d) All of these

Explanation: Concentrate mixture can be offered as mash (loose powder), pellets (compressed), or crumbles (broken pellets).

Q16. The Indian feeding standard for dairy animals is set by:

- (a) ARC (UK)
- (b) NRC (USA)
- (c) ICAR
- (d) FAO

Answer: (c) ICAR

Explanation: ICAR (Indian Council of Agricultural Research) sets feeding standards for India. ARC = UK, NRC = USA.

Q17. Water intake by cattle is approximately what percentage of body weight under normal conditions?

- (a) 3–5%
- (b) 5–7%
- (c) 8–10%
- (d) 12–15%

Answer: (c) 8–10%

Explanation: As a rule of thumb, daily water intake = 8–10% of the animal's body weight under normal environmental conditions.

Q18. Cattle typically drink what percentage of their daily water within 1 hour of milking?

- (a) 10–15%
- (b) 20–25%
- (c) 30–40%
- (d) 50–60%

Answer: (c) 30–40%

Explanation: Cattle drink 30–40% of their daily water requirement within 1 hour after milking.

Q19. Water troughs should be cleaned every:

- (a) 5 days
- (b) 7 days
- (c) 15 days
- (d) 30 days

Answer: (c) 15 days

Explanation: Water troughs must be cleaned every 15 days (fortnightly) to prevent algae growth and maintain hygiene.

Q20. The minimum depth of water in a drinking trough should be:

- (a) 6 inches
- (b) 12 inches
- (c) 24 inches (2 feet)
- (d) 36 inches

Answer: (c) 24 inches (2 feet)

Explanation: Minimum water depth = 2 feet (24 inches) so that the animal can fully submerge its mouth while drinking.

SECTION B — Fill in the Blanks

10 Questions | Each carries 1 mark

Q1. Feed costs constitute about _____ per cent of the total cost of animal production.

Answer: 70

Explanation: Feed is the single largest expense in dairy farming, making up approximately 70% of total production costs.

Q2. The crude protein content of feed is determined with the assumption that proteins contain approximately _____ per cent nitrogen.

Answer: 16

Explanation: Since proteins contain ~16% N on average, CP = Total Nitrogen $\times$ 6.25 (because $100 \div 16 = 6.25$).

Q3. In calculation of TDN, digestible Ether Extract (EE) is multiplied by a factor of _____.

Answer: 2.25

Explanation: Fats provide 2.25 $\times$ more energy per unit weight than carbohydrates or proteins.

Q4. When all water is removed from feed, the remaining portion is called _____.

Answer: Dry Matter (DM)

Explanation: Dry Matter = Total feed – moisture content. It represents the actual nutritive portion of the feed.

Q5. Daily Dry Matter requirement of indigenous cattle breeds is _____ per cent of body weight.

Answer: 2.0 – 2.5%

Explanation: Indigenous breeds have lower DM needs (2.0–2.5%) compared to crossbreds (2.5–3.0%).

Q6. As per the rule of thumb, _____ kg concentrate is required per litre of milk produced.

Answer: 0.4

Explanation: This 0.4 kg/litre rule applies to dairy cattle (indigenous, crossbred) and buffaloes for production feed.

Q7. For the storage of feed, the moisture content must be less than _____ per cent.

Answer: 12%

Explanation: Moisture above 12% promotes fungal and bacterial growth, causing feed spoilage and toxin formation.

Q8. Water troughs must be cleaned every _____ days to check the growth of algae.

Answer: 15 days (fortnightly)

Explanation: Regular cleaning prevents algae buildup, disease spread, and keeps drinking water clean for animals.

Q9. The minimum water depth in a drinking trough is _____ to allow the animal to submerge its mouth.

Answer: 2 feet (24 inches)

Explanation: This minimum depth ensures the animal can drink comfortably and completely.

Q10. Feed supplements are _____ in nature and are added in small quantities to the ration.

Answer: Non-nutritive

Explanation: Feed supplements do not provide major nutrients directly, but they improve feed utilisation efficiency and promote growth.

SECTION C — Frequently Asked Questions (FAQs)

20 Questions | Important for Board & Competitive Exams

Q1. What is animal feed? Why is it important for dairy animals?

Animal feed (feedstuff) is any material consumed by livestock that provides nutrition. It is important because:

- It provides energy for maintenance, growth, lactation, pregnancy, and work.
- Feed costs constitute ~70% of total dairy production costs.
- A balanced feed ensures optimum health, productivity, and reproduction in dairy animals.

Q2. What are the main types of animal feed? Explain with examples.

Animal feeds are classified into three main types:

1. Roughage: CF > 18%, TDN < 60%. High in fibre, low in energy. Examples: wheat straw, green maize fodder, berseem, silage.
2. Concentrate: CF < 18%, TDN > 60%. High in energy or protein. Examples: maize, barley, groundnut cake, mustard cake.
3. Balanced Feed: A mixture of roughage and concentrate providing all required nutrients.

Q3. What are the characteristics of a good animal feed?

A good animal feed must be:

- Palatable — Animals should eat it willingly.
- Economical — Cost-effective and locally available.
- Free from toxins — No harmful substances, mycotoxins, or adulterants.
- Bulky — Provides a feeling of fullness (satiety).
- Balanced — Contains proteins, carbohydrates, fats, minerals, and vitamins in correct proportions.
- Digestible — Nutrients should be easily absorbed by the animal's digestive system.

Q4. What is Crude Protein (CP)? How is it calculated?

Crude Protein (CP) includes all nitrogenous compounds in feed — pure proteins, amino acids, and non-protein nitrogen (NPN) compounds.

Calculation: $CP = \text{Total Nitrogen (N)} \times 6.25$

Reason: Proteins contain approximately 16% nitrogen on average.

Therefore: $100 \div 16 = 6.25$

Example: If a feed contains 2% nitrogen $\rightarrow CP = 2 \times 6.25 = 12.5\%$

Q5. What is TDN? How is it calculated and why is it important?

TDN stands for Total Digestible Nutrients. It is a measure of the energy value of a feed.

Formula: $TDN = \text{Digestible CP} + \text{Digestible CF} + \text{Digestible NFE} + (\text{Digestible EE} \times 2.25)$

Note: EE is multiplied by 2.25 because fats provide 2.25× more energy per gram than carbohydrates or proteins.

Importance: TDN helps compare feeds for energy content and allows correct ration formulation for different production stages.

Q6. What are the proximate principles of feed analysis? Explain each.

Proximate analysis divides feed into six fractions:

1. Moisture: Water and volatile substances.

2. Crude Protein (CP): All nitrogenous matter (proteins + NPN). Calculated as $N \times 6.25$.
3. Crude Fibre (CF): Indigestible plant cell wall components — cellulose, hemicellulose, lignin.
4. Ether Extract (EE): Crude fat — extracted using ether solvent.
5. NFE (Nitrogen-Free Extract): Soluble/digestible carbohydrates (starch, sugars).
6. Ash (Minerals): Inorganic residue after burning — calcium, phosphorus, etc.

Q7. What is the Dry Matter (DM) concept? What are the DM requirements for dairy animals?

Dry Matter (DM) is what remains after removing all moisture from feed. It represents the actual nutritive content.

DM Requirements (Rule of Thumb):

- Indigenous cattle: 2.0–2.5% of body weight per day.
- Crossbred cows and buffaloes: 2.5–3.0% of body weight per day.

Example: A 500 kg crossbred cow needs $500 \times 2.5\% = 12.5$ kg DM per day.

The 1/3 and 2/3 rule: 1/3 of daily DM should be concentrate, and 2/3 should be roughage/fodder.

Q8. Explain the feeding requirements of dairy animals at different production stages.

Feeding requirements vary with life stage:

- Maintenance: 4–6 kg dry straw/fodder to maintain body condition (all categories).
- Milk Production: 0.4 kg concentrate per litre of milk yield.
- Pregnancy: Indigenous = 1.25 kg extra concentrate; Crossbred = 1.75 kg; Buffalo = 0.75 kg.
- Growth: 1.00 kg additional concentrate for all growing animals.
- Breeding Bull: Feed as per free choice appetite + 2.50 kg concentrate.

Q9. What are feed supplements? What are their functions?

Feed supplements are substances added in small quantities to the ration. They are non-nutritive in nature.

Functions:

1. Stimulate growth and improve efficiency of feed utilisation.
2. Preserve nutritional properties of stored feeds.
3. Improve palatability and feed intake.
4. Prevent deficiency diseases and support metabolic functions.

Examples: Vitamins, trace minerals, antioxidants, growth promoters, probiotics.

Q10. What are the major ingredient categories used in concentrate mixture preparation?

The six major ingredient categories are:

1. Cereals: Maize, wheat, barley, oat, sorghum, millet — primary energy sources.
2. Oil Cakes: Groundnut, soybean, mustard, cottonseed cake — primary protein sources.
3. Agro-industry By-products: Wheat bran, rice bran, rice polish, broken rice — energy supplements.
4. Animal Protein Sources: Fish meal, blood meal, meat and bone meal — high-quality protein.
5. Mineral Sources: Di-calcium phosphate, limestone, oyster shells — calcium and phosphorus.
6. Other: Molasses (energy + palatability), jaggery, vegetable oils.

Q11. What are the steps in preparing concentrate mixture at the farm level?

Steps for concentrate mixture preparation:

1. Procure all required ingredients as per the formulation.
2. Weigh each ingredient accurately according to the mixture recipe (Table 4.6).
3. Grind grains (maize, wheat, barley) using a feed grinder.
4. Mix all ingredients thoroughly in a feed mixer.

5. The mixture can be offered as mash, or further processed into pellets or crumbles.
6. Store properly in closed bags in a cool, dry place with moisture < 12%.

Q12. What is green fodder chaffing? Why is it important?

Chaffing means cutting green fodder into small pieces (2–3 cm) before feeding to animals.

Importance:

- Increases palatability — animals eat more willingly.
- Reduces feed wastage significantly.
- Makes chewing easier, especially for young and old animals.
- Improves digestibility and feed utilisation efficiency.

Note: Dry fodder like wheat straw can be fed without chaffing, but green fodder must always be chaffed.

Q13. How should feed be stored properly at the farm?

Feed storage guidelines:

- Moisture content must be below 12% to prevent fungal growth.
- Store in closed bags in a cool, dry, well-ventilated area.
- Platform should be raised sufficiently to avoid flood and ground moisture.
- Raw materials and finished products must be stored separately.
- Use fumigation to control insects in the godown.
- Protect from rodents using rodent-proof containers and traps.
- Avoid aeration during rainy season — moisture from air will enter stored feed.
- Maintain a proper feed inventory record for stock management.

Q14. What is feed inventory? Why is it maintained?

Feed inventory is the systematic recording and periodic counting of all feed items stored at the farm.

It includes: date of receipt, description of feed, quantity received, storage location, and signature.

Importance:

- Helps track feed consumption and plan procurement.
- Prevents over-stocking or running out of feed.
- Helps control feed costs effectively.
- Identifies losses due to spoilage, rodents, or theft.
- Supports farm management decisions for the entire year.

Q15. How is regular supply of feed and fodder maintained throughout the year?

Planning strategy for year-round feed supply:

- Concentrate: Buy in bulk during harvest season when prices are low; store properly.
- Dry Fodder (Straw): Harvest and dry wheat straw thoroughly; store for use throughout the year.
- Hay: Prepare hay from surplus green fodder during peak growth season.
- Silage: Prepare silage from green maize or berseem during surplus periods; it preserves well through fermentation.
- Green Fodder Crops: Plan cultivation schedule in advance — sow crops so fresh fodder is continuously available.
- Feed Supplements: Purchase regularly after evaluating price and quality.

Q16. What are the water requirements of dairy animals?

Water requirement depends on body weight, diet, milk production, and environmental temperature.

Daily water requirement:

- Rule of thumb: 8–10% of body weight per day.

- Drinking water for adult cattle: approximately 55 litres/day.
- Water for shed cleaning: 70–75 litres/day.
- Total farm water need per animal: ~130 litres/day.

Factors that increase water need: high temperature, high fibre diet, high milk production, pregnancy.

Q17. What are the important points to remember while providing water to dairy animals?

Key points for watering dairy animals:

- Animals drink water multiple times throughout the day — more so at night.
- 30–40% of daily water is consumed within 1 hour after milking.
- Ideal water temperature: 17–27°C — not too cold, not too warm.
- Minimum water depth in trough: 2 feet (24 inches) so animal can submerge mouth.
- At least 2 watering points per group to prevent dominant animals from blocking weaker ones.
- Clean water troughs every 15 days to prevent algae growth.
- Always provide clean, fresh, uncontaminated water.

Q18. What is the difference between hay and silage?

Hay:

- Made by drying green fodder in sunlight until moisture drops to < 20%.
- Long shelf life; easy to store and transport.
- Nutritive value slightly reduced due to sun-drying.
- Examples: Berseem hay, lucerne hay.

Silage:

- Made by fermenting green fodder in an airtight silo (anaerobic fermentation).
- Moisture content: 70–75%.
- Preserves green fodder nutrients better than hay.
- Examples: Maize silage.
- Preferred during fodder scarcity periods.

Q19. How can feed wastage be reduced at the dairy farm?

Methods to reduce feed wastage:

- Chaff green fodder before feeding — reduces selective eating and spillage.
- Use proper manger/feed trough design that prevents animals from scattering feed.
- Continuous mangers are suitable for group feeding; individual mangers for tied animals.
- Feed at least twice daily in measured amounts — avoid overfeeding.
- Remove and discard leftover feed promptly — do not allow it to sit in sunlight.
- Store feed properly to prevent rodent and insect damage.
- Maintain feed inventory to track and control consumption.

Q20. What is the importance of balanced feed? Differentiate between roughage and concentrate.

Balanced Feed Importance:

A balanced feed provides all required nutrients — energy, protein, minerals, and vitamins — in correct proportions. It ensures optimum health, productivity, reproduction, and longevity of dairy animals.

Roughage vs Concentrate:

Parameter	Roughage	Concentrate
Crude Fibre	> 18%	< 18%
TDN	< 60%	> 60%
Energy	Low	High
Cost	Cheaper	More expensive

| Examples | Straw, silage, fodder | Maize, oil cakes |

Best practice: Feed both in the 2/3 (roughage) : 1/3 (concentrate) ratio for optimal results.

SECTION D — All Book Exercises Solved

Sessions 1 through 4 | Complete textbook exercise solutions

SESSION 1 — Animal Feedstuff, Characteristics & Quality

A. Multiple Choice Questions

1. Why do animals need feed?

- (a) Maintenance
- (b) Growth
- (c) Lactation
- (d) All of these

Answer: (d) All of these

Explanation: Animals require feed for maintenance of body functions, growth, lactation (milk production), and pregnancy.

2. Which of the following is NOT considered crude protein?

- (a) Pure proteins
- (b) Non-protein nitrogen compounds
- (c) Amino acids
- (d) Cellulose

Answer: (d) Cellulose

Explanation: Cellulose is a component of Crude Fibre (CF), not Crude Protein. CP includes proteins, NPN, and amino acids.

3. In TDN calculation, which component is multiplied by 2.25?

- (a) Crude Fibre
- (b) Ether Extract (EE)
- (c) Crude Protein
- (d) NFE

Answer: (b) Ether Extract (EE)

Explanation: EE (fat) provides 2.25 times more energy per unit weight than carbohydrates or proteins.

4. Which is a characteristic of GOOD feed?

- (a) Bulky
- (b) Rich in protein only
- (c) All of these
- (d) Palatable

Answer: (c) All of these

Explanation: Good feed must be bulky, palatable, economical, balanced, toxin-free, and digestible — not rich in just one nutrient.

B. Fill in the Blanks

1. Feed costs constitute about _____ per cent of the total cost of animal production.

Answer: 70

2. Wheat straw contains TDN of about _____.

Answer: 40%

3. In calculation of TDN, digestible EE is multiplied with a figure of _____.

Answer: 2.25

4. EE has _____ times greater energy density per unit weight compared to carbohydrates or proteins.

Answer: 2.25

5. The crude protein content of the feed is determined with the basic assumption that proteins contain approximately _____ per cent nitrogen.

Answer: 16

C. True or False

1. The TDN requirements change according to the stages of animal's life.

Answer: TRUE

Explanation: Dry cows need less TDN; lactating cows need more. Requirements change at every life stage.

2. Silage is considered as concentrate feed.

Answer: FALSE

Explanation: Silage is fermented green fodder and is classified as roughage (CF > 18%), not concentrate.

3. A good animal feed has high carbohydrate content.

Answer: FALSE

Explanation: Good feed must be balanced — containing proteins, carbohydrates, fats, minerals, and vitamins in correct proportion.

4. Concentrate feed is more expensive than roughage.

Answer: TRUE

Explanation: Concentrate feeds are processed and nutrient-dense, hence more costly than roughage like straw or green fodder.

5. Inorganic matter present in the feed is categorised as minerals.

Answer: TRUE

Explanation: The ash/inorganic residue after burning feed represents its mineral content — calcium, phosphorus, etc.

D. Match the Following

Column A	Column B	Correct Match
1. Ether Extract (EE)	(a) Amino acids	1 → (c) Crude fat / energy source
2. Crude Fibre	(b) Hemicellulose (energy)	2 → (d) Cellulose / Hemicellulose / Lignin
3. Crude Protein	(c) Back in protein	3 → (a) Amino acids
4. Total Digestible Nutrients	(d) Cellulose	4 → Energy quality measure
5. Ash	(e) Minerals	5 → (e) Minerals

SESSION 2 — Feeding of Dairy Animals

A. Multiple Choice Questions

1. Daily DM requirements of indigenous breeds of cattle are about:

- (a) 1–1.5%
- (b) 2.0–2.5%
- (c) 3.0–4.5%
- (d) 4.0–4.5%

Answer: (b) 2.0–2.5% of body weight

Explanation: Indigenous breeds have lower productivity and hence lower DM needs compared to crossbred animals.

2. Which of the following is NOT considered a cereal?

- (a) Maize
- (b) Barley
- (c) Mustard cake
- (d) Wheat

Answer: (c) Mustard cake

Explanation: Mustard cake is an oil cake (protein source), not a cereal. Maize, Barley, and Wheat are cereals.

3. Which is an agriculture by-product?

- (a) Rice polish
- (b) Soybean cake
- (c) Rapeseed cake
- (d) Groundnut cake

Answer: (a) Rice polish

Explanation: Rice polish is a by-product of rice milling. Soybean, rapeseed, and groundnut cakes are oil cakes.

4. Which is the Indian feeding standard?

- (a) ARC
- (b) NRC
- (c) ICAR
- (d) All of these

Answer: (c) ICAR

Explanation: ICAR (Indian Council of Agricultural Research) sets feeding standards for Indian dairy animals. ARC = UK, NRC = USA.

B. Fill in the Blanks

1. Dairy animals consume mainly two types of feed — _____ and _____.

Answer: Concentrate and Fodder (Roughage)

2. Minimum nutrients required to maintain the normal body conditions = _____.

Answer: Maintenance requirement

3. When water is taken out from the feed, the remaining portion is termed as _____.

Answer: Dry Matter (DM)

4. Feed supplements are added in small quantities to a ration to stimulate _____ and improve efficiency of feed utilisation.

Answer: Growth

5. As per rule of thumb, in buffaloes, 1 kg concentrate is required for every _____ litres of milk production.

Answer: 2.5 litres

C. True or False

1. Fodder is always available in green form.

Answer: FALSE

Explanation: Fodder can be green (fresh) or dry (hay, straw). Both forms are used in dairy farming.

2. Nutritive value of good quality green fodder is equivalent to concentrate mixture.

Answer: TRUE

Explanation: High-quality green fodder like berseem or maize fodder can match the nutritive value of a concentrate mixture.

3. All feeds contain some amount of water.

Answer: TRUE

Explanation: Every feedstuff — even dry ones like wheat straw — contains some moisture. Only DM (after removing water) is 100% solids.

4. A single feed ingredient can meet the total nutritional requirements.

Answer: FALSE

Explanation: No single ingredient provides a complete balanced diet. A combination of roughage, concentrate, and minerals is always needed.

5. Feed supplements are non-nutritive in nature.

Answer: TRUE

Explanation: Supplements are not primary nutrient sources. They enhance feed utilisation, improve health, and preserve feed quality.

SESSION 3 — Preparation of Animal Feed

A. Multiple Choice Questions

1. Which is a traditional storage structure?

- (a) Silo
- (b) Brick built godown
- (c) Improved bins
- (d) Mud bin

Answer: (d) Mud bin

Explanation: Mud bin is the traditional feed storage structure. Silos, brick godowns, and improved bins are modern structures.

2. In which form can concentrate mixture be offered to animals?

- (a) Mash
- (b) Pellets
- (c) Crumbles
- (d) All of these

Answer: (d) All of these

Explanation: Concentrate can be offered as mash (loose powder), pellets (compressed), or crumbles (broken pellets).

3. What type of ingredients are used for preparation of concentrate mixture?

- (a) Grains
- (b) Oil cakes
- (c) Mineral mixture
- (d) All of these

Answer: (d) All of these

Explanation: Concentrate mixture uses cereals (grains), oil cakes (protein), mineral mixture, salt, and agro-by-products.

4. Feed supplements are used in animal feed to:

- (a) Preserve nutritional properties of stored feeds
- (b) Stimulate growth and improve feed utilisation
- (c) Both (a) and (b)
- (d) All the above

Answer: (d) All the above

Explanation: Feed supplements serve multiple functions — preserving nutritional quality, stimulating growth, improving palatability, and preventing deficiencies.

B. Fill in the Blanks

1. _____ is used to grind the feed items.

Answer: Feed Grinder / Hammer Mill

2. The balanced mixture of different feed ingredients mixed in suitable proportions is known as _____ mixture.

Answer: Concentrate

3. For storage of feed, moisture content must be less than _____ per cent.

Answer: 12%

4. Proper aeration is provided during dry and clear weather, but care is taken to avoid aeration during _____ season.

Answer: Rainy

5. Large quantities of stored feed are usually damaged by _____.

Answer: Rodents and insects (pests)

C. True or False

1. Rice polish and wheat bran are used in concentrate mixture as a source of protein.

Answer: FALSE

Explanation: Rice polish and wheat bran are energy/carbohydrate sources. Protein sources are oil cakes (groundnut, soybean, mustard cake).

2. All feed ingredients used in concentrate mixture need to be grinded before mixing.

Answer: FALSE

Explanation: Not all ingredients need grinding. Only grains (maize, wheat) are ground. Oil cakes may be used as flakes; minerals are already powdered.

3. Chaffed fodder is less palatable to the animals.

Answer: FALSE

Explanation: Chaffed fodder is MORE palatable — smaller pieces make it easier and more comfortable for animals to eat, reducing wastage.

4. The feed storage platform is sufficiently high to avoid flood.

Answer: TRUE

Explanation: Raised storage platforms prevent moisture absorption from the ground, flooding, and rodent access from below.

SESSION 4 — Maintaining Feed and Water Supply

A. Multiple Choice Questions

1. Which of the following animal feed is chopped before feeding?

- (a) Wheat straw
- (b) Green fodder
- (c) Concentrate
- (d) None of these

Answer: (b) Green fodder

Explanation: Green fodder must be chaffed (chopped) before feeding. Dry straw can be fed without chopping; concentrate is already processed.

2. Continuous manger is suitable for:

- (a) Group feeding
- (b) Individual feeding
- (c) Both (a) and (b)
- (d) None of these

Answer: (a) Group feeding

Explanation: A continuous manger (long trough) allows multiple animals to eat simultaneously. Individual mangers are for tied/stall-fed animals.

3. Water requirement of the animals depends upon:

- (a) Body weight
- (b) Diet
- (c) Environmental temperature
- (d) All of these

Answer: (d) All of these

Explanation: Water needs are influenced by body weight, type of diet (dry vs green fodder), milk production level, and temperature.

4. Long-term storage of ingredients for concentrate mixture could lead to:

- (a) Insect infestation
- (b) Damage by rodents
- (c) Loss of moisture
- (d) All of these

Answer: (d) All of these

Explanation: Long-term storage risks include pest infestation, rodent damage, moisture changes, and loss of nutritive value.

5. Which of the following is important in planning regular feed and water supply to the animals?

- (a) Labour
- (b) Machinery
- (c) Feedstuff
- (d) All of these

Answer: (d) All of these

Explanation: Regular feed and water supply requires all three M's — Material (feedstuff), Man (labour), and Machinery.

B. Fill in the Blanks

1. About _____ litres of drinking water is required daily for adult cattle.

Answer: 55 litres

2. Water troughs are cleaned every _____ days to check the growth of algae.

Answer: 15 days

3. Water depth of minimum _____ is provided to the livestock to submerge their mouth.

Answer: 2 feet (24 inches)

4. As a rule of thumb, water intake by the cattle is about _____ per cent of body weight during normal environmental conditions.

Answer: 8–10%

C. True or False

1. Hay contains more moisture than silage.

Answer: FALSE

Explanation: Silage has 70–75% moisture (fermented green fodder). Hay is sun-dried and has less than 20% moisture.

2. Feed and fodder are supplied at least twice daily.

Answer: TRUE

Explanation: Feeding at least twice daily ensures animals receive consistent nutrition and do not go hungry for long periods.

3. Leftover feed is acceptable in sunlight.

Answer: FALSE

Explanation: Leftover feed must be discarded. Sunlight causes oxidation, loss of vitamins, and growth of harmful microorganisms.

4. During storage of feed, some amount of feed is wasted due to the infestation of insects, rodents, etc.

Answer: TRUE

Explanation: Pest infestation is a major cause of feed loss during storage. Proper storage, fumigation, and rodent control are essential.

Summary of Contents

Section	Content	Marks
A	Multiple Choice Questions (MCQs)	20
B	Fill in the Blanks	10
C	Frequently Asked Questions (FAQs)	20
D	All Book Exercises Solved (Sessions 1–4)	Complete
	TOTAL	50+ marks coverage