

MODULE 4

Unit 1	Classes of Farm Animals
Unit 2	Distribution of Farm Animals in Nigeria
Unit 3	Livestock Management Systems
Unit 4	Principles of Livestock Management
Unit 5	Economic Importance of Fish to Man

UNIT 1 CLASSES OF FARM ANIMALS

CONTENTS

1.0	Introduction
2.0	Objectives
3.0	Main Content
3.1	Basis of Stomach Structure (Feeding Habit)
3.1.1	Ruminants
3.1.2	Non-Ruminants
3.1.3	Monogastric Farm Animals
3.2	Basis of type of food eaten
3.2.1	Herbivores
3.2.2	Carnivores
3.2.3	Omnivores
3.3	Basis of purpose of keeping farm animal
3.3.1	Beef animals
3.3.2	Dairy animals
3.3.3	Work animals
3.3.4	Egg-laying animals
4.0	Conclusion
5.0	Summary
6.0	Tutor-Marked Assignment
7.0	References/Further Reading

1.0 INTRODUCTION

Farm animals vary widely not only in their types, but also in their feeding habits (which relate mainly to the structure of their gastro-intestinal system), type of food they eat as well as the purpose of keeping the animals.

2.0 OBJECTIVES

By the end of this unit, you should be able to explain:

- the principles guiding the grouping of farm animals, and

- the types of farm animals found in each grouping.

3.0 MAIN CONTENT

3.1 Basis of stomach structure (feeding habit)

Farm animals can be classified into three groups, namely

3.1.1 Ruminants

A ruminant is any of the various hoofed, even-toed, usually horned mammals of the suborder Ruminantia, characteristically having a stomach divided into four compartments and chewing a cud (rumination) consisting of regurgitated, partially digested food. The stomach is compartmentalized into a rumen, reticulum, omasum and abomasum, thereby conforming the capacity to handle leaves, grasses, shrubs and other herbage rich in cellulose and hemicellulose. Fibre is broken down into the three short-chain (volatile) fatty acids (VFAs), namely acetic, propionic, and butyric acids by bacteria and protozoans (including ciliates such as *Paramecium*) by fermentation. The stomach can also handle other foodstuffs. They eat quickly, storing masses of grass (grazers) and foliage (browsers) in the rumen. Most of them have small or no upper incisors. Examples are cattle, sheep, goats, deer and giraffes. Some have three-chambered stomachs e.g. okapis, pronghorn, camels and chevrotains. Other examples of ruminants are llamas, bison, buffalo, wildebeest, and antelope. The major advantages of the ruminant pregastric fermentation are

- c) microbial products are of value to the host (e.g. VFAs, B vitamins) and are presented to efficient absorptive sites in both the rumen and the lower bowel;
- d) ammonia and substances that are metabolized to ammonia (e.g. urea) are used by the microbes for synthesis of high-quality microbial protein, which is subsequently subjected to gastric and small bowel digestion;
- e) selective retention of particles at the reticulo-omasum orifice, and the added opportunity for mechanical breakdown of fibres during rumination, enhance digestion of coarse foods;
- f) the large quantities of gas that are produced may be readily released from the system by eructation (belching);
- g) the large input of saliva provides a highly buffered medium with a consistency that permits effective mixing by ruminal contractions; and
- h) toxic substances in the diet may be detoxified during fermentation by exposure to small intestinal absorption.

3.1.2 Non-Ruminants

These are those that have simple stomachs. They feed also on grasses and other materials but do not chew the cud. Some of them exhibit a behavioural specialization called “coprophagy” i.e. the re-ingestion of a special kind of faeces (soft faeces; the softer, larger lighter type which are not dropped by the animal but eaten directly from the anus) within the caecum, which allows the food to pass through the entire digestive tract a second time thus facilitating a more complete digestion and utilization. The adaptation helps the animals to circumvent the disadvantage of locating the cellulose fermentation in the posterior part of the intestinal tract. Coprophagy is common in rodents e.g. rabbits, hares. Prevention of coprophagy results in rapid development of deficiencies of vitamin K, biotin and other vitamins; it also reduced growth rate (15% in rats) and abnormal growth and decrease food digestibility, protein utilization and nitrogen retention in affected animals. Cellulose digestion in a large number of non-ruminant mammals e.g. horses, also depends on fermentation by symbiotic microorganisms in the distal part of the GIT, the caecum which is a large diverticulum from the intestine. Many birds have two large caeca suitable for cellulose fermentation. In some non-ruminant herbivores e.g. langur monkey and quokka, multiple-compartment stomachs give a similar digestion as that of the ruminants, except for the absence of the regurgitation and re-chewing of food which distinguishes them from ruminants.

3.1.3 Monogastric Farm Animals

In this group, the stomach is relatively simple in structure, and similar to that of man without compartments. Generally, non-ruminants such as pigs, poultry (chickens, ducks, turkeys, guinea-fowl and geese) and especially fish, require feed that contains more expensive and high-quality ingredients than ruminants. Pigs and poultry require protein-enriched feed to supply the required amino acid balance. Also, laying hens are often fed yellow maize to influence yolk colour. Pigs, like man, are omnivorous and eat both plant and animal tissues. Non-cereal feed resources for pigs include sugar-cane juice, sugar-cane molasses, juice from sugar palm tree, oil, whole fruit and by-products of the African oil palm, cassava roots and by-products, and organic waste from urban households, restaurants and canteens. Other products and by-products from tree, root and tuber crops are included in tropical pig diets on an *ad hoc* basis.

3.2 Basis of type of food eaten

Farm animals are classified into three groups, namely

3.2.1 Herbivores

Ruminant and non-ruminant farm animals that feed on plant materials. They need to maintain continuous fermentation and absorption in those parts of the GIT where cellulose-containing materials can be broken down. Functional differences between species can be related to the rates at which digesta pass through the different parts of GIT.

3.2.2 Carnivores

These are farm animals that obtain their food by eating other animals, and whose digestion relies largely on enzymes rather than microorganisms. Microbial digestion of cellulose occurs in the colon of the dog, but to such a small extent that the colon can be removed without affecting the perfect survival of the animal.

3.2.3 Omnivores

These are farm animals that feed on both plants and animals, but whose digestion is mainly enzymatic as in carnivores. Pig, an omnivore, is herbivorous under domestication because in addition to enzymatic digestion, a good deal of microbial breakdown of plant material occurs in the large intestine, and also, to a large extent in the stomach of the animal.

3.3 Basis of Purpose of Keeping Farm Animal

There are four groups of farm animals, namely

3.3.1 Beef Animals

These are farm animals that are kept primarily for the production of meat e.g. beef cattle, goats, sheep, broilers, turkeys, geese.

3.3.2 Dairy Animals

These are farm animals kept primarily for milk production e.g. cow.

3.3.3 Work Animals

These are farm animals kept primarily for use as source of farm power e.g. bull, mules, bullocks, buffaloes.

3.3.4 Egg-Laying Animals

These are farm animals primarily kept for egg production e.g. poultry such as hens.

4.0 CONCLUSION

In this unit, you should have learned that farm animals can be grouped on the bases of their feeding habits, food eaten and purpose of keeping them.

5.0 SUMMARY

Farm animals vary widely in their feeding habits, type of food they eat and the purposes for which they are managed.

6.0 TUTOR-MARKED ASSIGNMENT

- 1) What is a “ruminant” animal?
- 2) State any four advantages of the ruminant pre-gastric fermentation.
- 3) Write short notes on “coprophagy”.
- 4) Enumerate the limitations of the multi-compartment stomachs of some ruminant herbivores.

7.0 REFERENCES/FURTHER READING

School of Agriculture & Agricultural Technology, The Federal University of Technology, Akure, Nigeria. *Introduction to General Agriculture* (CSP 201).

Ruminant, Wikipedia, the free encyclopaedia.
<http://en.wikipedia.org/wiki/Ruminant>

Non-ruminants. <http://www.bccresearch.com/fod/sampleFOD017B.pdf>

Feed resources for non-ruminants.
<http://www.fao.org/ag/aga/AGAP/FRG/AHPP126/Ch4.pdf>