AGRICULTURAL SCIENCE

**SECOND TERM NOTES 2024/25**

**CLASS: JS 1**

**FORMS OF FARM ANIMALS.**

Meaning of farm animals

Farm animals are animals that are reared by man for different purposes. Farm animals include cattle, pigs, fish, snails, etc.

1) Poultry birds: This group belongs to a family called Aves. They have feathers, which cover their bodies. They include fowls, turkeys, pigeons, ostriches, doves etc.

2) Aquatic Animals: These are animals which live inside the water. The most popular from this group are fishes. They belong to the group known as Pisces. Many of them are covered with scales and they are cold blooded.

Cold blooded animals are the animals that cannot control their body temperature and therefore become sluggish in cold weather.

Examples of aquatic animals

- Fishes

- Reptiles

- Amphibian

They are often seen sunning themselves to warm up.

3). Work animals: These are animals that are used for working in the farm They are used for carrying loads, Ploughing, harrowing and ridging -Examples of these animals are cattle, bullocks (Sokoto gudali, white Fulani), horses, camels and donkeys. They are referred to as beasts of burdens.

Characteristics

a) They are well built with good body conformation.

b) They can survive or travel long distance without water.

c) They are rugged and have very great strength.

4) Dairy animals: These are animals reared for the purpose of producing milk. Examples are cattle, sheep, goat, etc. milk provides protein, vitamins and minerals.

Characteristics

a) They are lean and have angular form of body

b) They have well developed mammary gland system

c) They have high feed conversion efficiency

5) Guard animals: These are animals domesticated or tamed and used for protecting life and properties from danger. Examples are dogs, parrots, cat, etc.

Characteristics

1) They are easily controlled

2) Most of them are of an average size

6) Security Animals

These are the animals being used to safeguard lives and property, either on the farm or in the home. e.g. Dog, ostriches, geese, cats etc.

7) Pet animals

These animals are kept for companionship, tourism or amusement, these groups of animals usually stay in the home of their owners e.g. Pigeon, parrot, dove, dogs and cats.

8) Livestock

This is a group of farm animals which are kept for human consumption, or for sale. They include all domesticated birds (poultry), rabbits, cattle, goats, sheep.

**Basic characteristics of Farm animals**

a) Characteristics of poultry birds

i) They are covered with feathers

ii) They maintain constant temperature

iii) They use their beak to feed

iv) They usually reproduce by laying eggs and incubate the eggs.

v) They are non-ruminant animals.

vi) They have two compound eyes that are very sensitive.

Characteristics of Fishes

i) They are cold-blooded animals.

ii) They possess fins.

iii) They possess scales on their bodies.

iv) Some are living in freshwater while some are living in saltwater.

v) They possess gill or operculum for breathing.

vi) They are invertebrates’ animals.

**Characteristics of Mammalian Farm Animals**

i) They are covered with hair.

ii) They are vertebrate animals.

iii)They are warm-blooded animals.

iv) Mammals have different types of teeth.

v) They bear their young alive (i.e. viviparous).

vi) They secrete milk through their breasts to feed their young ones.

Classification of Farm Animals

There are many kinds of animal. Some are living in the land (terrestrial), some on the tree (arboreal) while some live in the water (Aquatic).

Also, several of them are wild, e.g. lion, tiger, leopard etc. therefore they live in the forest, but some are human friendly therefore they live close to human beings, and they are called domestic animals.

**Classification of Farm Animals based on Stomach types**

The varieties of food needed by farm animals depend on the ability to digest the foods. The nature and shape of the stomach of an animal affect its manner of feeding.

Ruminant animals

All ruminant animals are herbivore i.e. they feed on forage crops. The stomach is divided into four Chambers, which include rumen, reticulum, omasum and abomasum. All ruminants are herbivores but not all herbivores are ruminants. Digestion in ruminant is more complex because of different chambers they possess. Ruminant animals are known for rumination, a situation whereby already chewed and swallowed food is brought back to the mouth rekeyed and finally swallowed for proper digestion. Examples of ruminant animals include cattle, sheep, goat, hippopotamus and antelope.

Non-ruminant animals

Non-ruminants are also known as monogastric animals. They have simple or linear stomach and digestion is simple. Unlike ruminant animals, non-ruminant animals do not have a complex digestive system, and they don't bring back already swallowed food. They feed on concentrates and little number of vegetables. Examples of non-ruminants are pig, rabbit, fowl, duck.

**Classification of farm animals based on feeding pattern**

I) Herbivores: These are the groups of animals that feed only on plants. Herbivores obtain their energy by digesting plant materials from green plants and roughages, their teeth are adapted for cutting and grinding plant materials. The grinding teeth have broad surfaces which rub against each other. Examples include cattle, goat, etc.

ii) Carnivores: These animals feed on flesh and derive energy from eating herbivores. They range from insects, spider to birds, lizards and lions. They are used for capturing and killing other animals. Since they feed on flesh, they take large quantity of protein. Examples include dog, cat, lion, tiger, eagle, etc.

iii) Omnivores: These are animals that feed on both plants and animals. They derive their energy from eating both plants and animals. They have two sets of teeth through their lifespan. The first set, called the milk teeth, grow out after a few months beginning with the front teeth. The second set, the permanent teeth later grow to replace the milk teeth.

**Classification of farm animals based on habitat**

Habitat is a place where a particular animal live or can be found when it is being looked for. There are two types of habitats namely:

1) Macro habitat: This is a large habitat e.g. tropical forest

2) Micro habitat: This is a small habitat e.g. Small pools of water and hollow trunks. Based on where they live, animals can be classified as terrestrial, arboreal and aquatic.

I) Terrestrial animals: Terrestrial animals are the animals that live on land. They live, eat, sleep and reproduce on the land. Examples of terrestrial animals are dog, poultry, pig, goat and cow, etc.

ii) Arboreal animals: These are the animals that live, sleep and reproduce on the trees. Though some of arboreal animals may be found on the ground at times, but they could not perform well as when they are operating in their natural habitat. Examples of arboreal animals are squirrel, woodpecker bird, eagle, etc.

iii) Aquatic animals: These are the animals which live in water me. They are found in lakes, streams, rivers, oceans, seas and man-made ponds. Many of them are cold-blooded animals. Examples include fish, shrimp, crab, crayfish, prawn, lobster and oyster.

iv) Amphibian animals: Amphibian animals are the animals which live on both land and in water. They are also typically cold-blooded animals. Examples are toad, frog, alligator, crocodile, etc.

**Types of Fish**

Fishes belong to the group called Pisces. They are cold-blooded animals, and they possess a good sense of smell Also, all fishes are backbones (vertebrate) animals which breadth with the aid of gills, covered with operculum.

Fishes are raw materials for the industries and contribute to nutritive value both to human and other animals because they contain a large percentage of protein, fats and oils.

Fishes can be categorized into three broad classes, namely:

i. Primitive fishes

ii. Cartilaginous (boneless) fishes

iii. Bony fishes

Cartilaginous (boneless) fishes

These are the fishes that do not have bones, but their selected structures are made up of cartilage.

Examples of cartilaginous fishes

- Shark

- Ray

- Skate

- Salmon

- Dolphin

-Whale

They usually live in salt water

- Oceans

-. Seas

Bony fishes

Bony fishes have skeletons which are made up of bones. They usually live in fresh water such as rivers, streams and man-made ponds.

Examples of bony fishes

- Tilapia

- Catfishes

- Mackerels

- Storks

- Cods

- Tunas

- Soles

- Carps

- Eels

- Herrings

- Salmons

Diadromous fishes

These are the fishes that live in both salt water and fresh water.

Examples of diadromous fishes

- Mackerel

- Trout

- Catfish

- Carp

- Salmon.

Uses of Farm Animals

i) They serve as sources of food

Appreciable amount of food being taken by a human being comes from farm animals. These foods include fish, milk, cheese, meat and yoghurt.

ii) They are means of transportation

Some animals are good for transportation, such animals include horses, donkeys and camels.

iii) Sources of farm power

Power is ability to do work. Some of these animals are very useful to Farmers.

Before the invention of farm machines, farm animals play major roles in tilling the soil, pumping of water and transporting agricultural products. Such animals include cattle, ox or oxen, horses.

iv)Production of leather

Animal leathers are very useful in many ways. For instance, animal leather is processed to clothes, bags and gloves.

The animal hair is processed to fur or wool, which are good at making blankets and other cold resistant clothes.

v) Sources of manure

Cow dungs, poultry droppings and decayed animals are very good sources of humus, which contain high level of nitrogen, and other nutrients that are essential for plant growth.

Also, animal by-products are used in the generation of biogas, which is a good source of energy and power.

vi) Sports and guard

Animals such as horses, can be used for sport while dog are used for security.

**BREED OF ANIMALS**

BREEDS OF GOATS

They are the earliest domesticated and the most widely distributed animals with high concentration in Africa and India. Goats have ability to withstand harsh weather conditions. The common breeds of goats are:

1) Sokoto red (maradi)

2)Kano brown

3) Sahel goat, etc.

TERMS USED FOR GOATS

Billy: A matured male goat

Nanny: A matured female goat

Buck: A male goat of breeding age

Doe: A female goat of breeding age

Kid: A male goat of either sex

Kidding: Parturition in doe

BREEDS OF PIGS

Pigs are the most prolific (productive) of all farm animals. They are omnivorous and heavy feeders. Pig production is not as popular as goat production because of religious reasons.

Their breeds include:

WAD pigs

Large white (Yorkshire)

Land race pigs

American pigs

Duroc

Hampshire, large black, Chester white, polar China, Tam worth, etc.

TERMS USED IN DESCRIBING PIGS

Boar: A matured adult male pig

Sow: A matured adult female pig

Hog (Barrow): A castrated boar

Piglet: A young pig of either sex

Barrowing: Parturition in sow

Pork: meat of pig

Lard: Fat from pig

Gestation period: 114 days

BREEDS OF RABBIT: A productive rabbit can produce up to four or five times a year. It is not a native to tropical Africa but can do well under local tropical conditions. Examples of breeds of rabbit are:

Flemish giant

California rabbit

New Zealand rabbit

Chin chilla

Checkered giant

Dutch spotted rabbit

TERMS USED IN DESCRIBING RABBIT

Buck: A mature adult male rabbit

Doe: A matured adult female rabbit

Kitten: A young rabbit of either sex

Colony: A group of rabbit

Kindling: Parturition in doe

Gestation period: 29–30 days

**USES OF FARM ANIMALS**

Farm animals are reared for the following purposes: They are reared for food, work, clothing, security/protection, sport and recreation, fertilizer, medicine, raw materials, and livestock feed. Let us explain each of the usage briefly:

1) FOOD: Many food products are derived from farm animals. We get products like meat, milk, eggs, wool/hair from farm animals. Also, animals’ by-products like feathers, bones, blood droppings/dung, fat and oil are derived from farm animals. Food products and by products from farm animals are very useful to man and industries.

2) WORK: Bigger farm animals can be used to work in the farm. Bullocks can be used to work in the farm. Bullocks can be used to draw working machinery like plough, harrows, ridger while cultivating the soil. Donkey, Camels are used to carry farm loads, while horse is used for transportation.

CLOTHING: Animal products such as wool, skin and furs are used for clothing. Skins and fibres from cattle, sheep and used for clothing and leather materials. This can be used for footwear, bags and drum. Feathers of poultry are used in the production of pillows and mattresses.

SECURITY AND PROTECTION: Some farm animals e.g. Dogs and parrots are used for protection. The dogs assist the guards while protecting the house. Their barking alert the occupants of a house about strangers entering the house. The parrots also make some sounds to give information to the keeper of the house

SPORT AND RECREATION: Farm animals like horse and chicken (fowl) are used for sporting activities. Horses are used for games like horse racing and polo. In Mexico and Philippines, chicken is used for games like chicken fights.

FERTILIZER: Animal droppings from poultry, goats, sheep, rabbit and cow dung are good sources of organic manure (fertilizers) which are used to add nutrients to the soil. That is what is referred to as farm manure.

MEDICINE: Medicines are manufactured from substances taken from the body of some animals. Thyroid gland, hormones (insulin) taken from the body of sheep and cattle can be used to cure diabetes. For example, insulin is used to cure diabetes. Vaccine is obtained from egg white (albumen) which is used by the doctor to treat people.

RAW MATERIALS: Some animals products and by- products are used by agro-allied industries. Animal bones, hooves are good for adhesives. Fats are used for candles, soap, etc.

**DISTRIBUTION OF FARM ANIMALS AND FACTORS AFFECTING THE DISTRIBUTION OF FARM ANIMALS IN NIGERIA.**

Many farm animals commonly reared by farmers are found in different parts of the nation, due to some factors that favoured their growth and development.

Below shows the major farm animals and the state where they are majorly found:

Cattle - Kano, Sokoto, Kaduna

Goats/Sheep - Northern states and some part of the south e.g. Oyo, Ondo, Ekiti

Poultry - Most of the major cities in the nation

Fish - States with large water

Pigs - Most southern states e.g. Edo, Delta, Rivers and other places where the weather is conducive

Rabbits - Cities where poultry are successfully reared

FACTORS AFFECTING THE DISTRIBUTION OF FARM ANIMALS IN NIGERIA

The most important factors affecting the distribution of farm animals in Nigeria include:

1) Culture of the people

2) Climate

3) Availability of natural pasture

4) Religion of the people

5) Incidence of pests and diseases

1) CULTURE OF THE PEOPLE: Animal rearing is a common occupation of families in the northern part of Nigeria. Most of the cattle sheep and goayare from the north. That means the northern Nigeria has a culture of animal rearing.

2) CLIMATE: Climate is the average weather condition of a place over a long period of time. Climatic factors include rain fall, temperature, light, wind and relative humidity determines the type and number of farm animals in a particular place. For instance, in the north rainfall and relative humidity is low cattle, goats and sheep are better reared there than any other part. Much rainfall in the south increases the spread of pests and diseases and consequently affect animal production.

3) RELIGION OF THE PEOPLE: Religion is also an important factor in the distribution of farm animals. For example, goats and rams are more abundant in the western and northern parts of Nigeria where most Muslim live, they used these animals for festivals. Muslim religion prohibits the eating of pigs, so, pigs are not common in the north, where Muslims are in large population.

4) AVAILABILITY OF NATURAL PASTURES: Natural pastures are grasses used to feed cattle, goats and sheep. These grasses are more in the north and favour the rearing of animals.

5) INCIDENCE OF PESTS AND DISEASES: Tsetse fly, which is a carrier of the parasite, Trypanosoma which causes the disease known as trypanosomiasis is prevalent in the south and presence of rainfall and bid trees in the south contribute to the increase of tsetse fly.

**WEEDS**

A weed is a plant that grows where it is not wanted e.g. a vegetable plant growing on a cassava plantation is a weed

CHARACTERISTICS OF WEEDS

1) HIGH PRODUCTIVE CAPACITY: Weed possess high reproductive capacity and are always the first to emerge and show when the necessary conditions are provided. They have many seeds. For example, a single grass head may produce thousands of seeds.

2) HIGH RESISTANCE CAPACITY: They are capable of withstanding adverse conditions because of their tough protective seed coats e.g. seeds of some legume.

3) ABILITY TO REGENERATE: Some weeds are capable of regenerating and therefore very difficult to eradicate compiling species, elephant grass and spear grass are example of weeds that possess this characteristic.

4) EARLY DISPERSAL: Weed seeds possess various devices for early dispersal. These include spines, hooks, parachutes of hair, with which they are easily dispersed e.g. tridax, goat weed and desmodium

5) HIGH COMPETITIVE AND AGGRESSIVE GROWTH: Weed possess highly competitive growth habit and can easily smother crops. For examples: spear grass, elephant grass can easily over run a farm if not regularly checked.

**USES OF WEEDS**

1) FOOD: Some weeds are used as food for man e.g. African spinach (Amaranthus Coudatus), Cochurs Olitoris, etc.

2) ANIMAL FEEDS: Some weeds are used as food for feeding farm animals e.g. guinea grass, sedge and elephant grass.

3) MEDICINE: Most weeds are medicine. Drug can be extracted from such weeds e.g. lemon grass.

4) EROSION CONTROL: Weeds are used for control tiny erosion e.g. Bahama grass.

5) SOURCE OF ORNAMENTAL: Weeds are the major source of ornamental crops e.g. pride of Barbados, Carno lily, Rose, Cronton and Hibiscus

**CLASSIFICATION OF WEEDS BASED ON LIFE CYCLE**

Weeds are grouped in three classes. Those include:

i) Annual weeds

ii) Biennial weeds

iii) Perennial weeds

ANNUAL WEED

These are weeds which complete their life cycle in one year. They grow, reach maturity and die within a year. Annual weeds include Tridax plant, Goat weed, Sigelia and so on.

BIENNIAL WEED

These are weeds that complete their cycle in two years. The first year is used by the weeds to grow and store food. Reproduction and maturity take place in the second. Examples of biennial weeds are wild carrot, yellow racket

PERENNIAL WEEDS

These are weeds that take more than two years to complete their lifecycle or ripe for harvesting perennial weed include giant star grass, guinea grass, carpet grass, centxo, tropical kudzu.

**COMMON WEEDS AND THEIR BOTANICAL NAMES**

Spear grass - Imperata Cylindrica

Guinea grass- Panicum Maximum

Elephant grass- Pennisetum pupereum

Wild hemp- Sida Spp

Water leaf- Talinum triangulare

Goat weed - Ageratum Conzydiodes

Stubborn grass- Elusine Indica

P.W.D weed- Tridax Procumbens

Pig weed- Boerhavia Diffusa

Carpet grass- Axonopus Compressus

Pigeon pea- Cajanus Cajan

Witch weed- Striga Senegalenis

**PESTS**

Pest is defined as a living organism, plant and animals which can cause damage to our cultivated crops plants, farm animals and humans. Examples of common pests include insects like grasshoppers and bettles, mammals such as rats and birds such as weaver birds.

CLASSIFICATION OF INSECT PESTS ACCORDING TO THEIR FEEDING HABITS

According to their mode of feeding insect pests are classified into three groups, these are:

i) Biting and chewing insect pests

ii) Piercing and sucking insect pests

iii) Boring insect pests

BITING AND CHEWING INSECT PESTS

Insect pests in this groups have mouth parts which are specially made for biting and chewing parts. The mouth parts of insects in this group consists of a pair of very hard biting jaws called mandibles, a second pair of jaw called maxillae, flat upper lips called the labrum and lower lips known as librum. The mandibles are used to bite off and chee parts of the crops while maxillae are used to bite off and chew parts of the crops into the mouth. Examples of biting and chewing insects include crickets, grasshoppers, bettles, termites, armyworm, praying mantis.

PIERCING AND SUCKING INSECTS

The insects this group have mouth part that are shaped like injection needles, called proboscis, their mouth parts are adapted to pierce into plant parts and sucking the sap and juice of the plant. Examples of piercing and sucking insects include aphids, cotton stainer, mealy bugs, ehite flies and capsids.

BORING INSECTS

These are insects that bore hole into plants tissues and seeds. Boring insects are also called burrowing insects. Examples of boring insects are beans bettles, weevils such as rice and maize weevils.

**CLASSIFICATION OF INSECTS BASED ON THIER LOCATION**

Based on location, insect pests are classified into two namely:

1) Field insect pests

2) Storage insect pests

FIELD INSECT PEST: Thses are insects that attack crops on the field that is before harvesting and field pests include:

1) Stem borers

2) Fruits and seeders: Examples are beetle fruit, flies, etc.

3) Root feeders: Examples are yam beetles.

STORAGE INSECT PESTS: This group of insects attack harvested products in the store. Examples include bean beetles, weevils such as rice and maize weevils.

**ECONOMIC IMPORTANCE, PREVENTION AND CONTROL OF INSECT PESTS**

Pests may cause damages to crops in the following ways:

1) Insect pests destroy field crops through their activities such as biting, chewing, boring and sucking

2) They cause reduction in the viability (germinating capacity) of stored produce.

3) Heavy attack by insect pest may lead to total failure

4) They reduce the market of crops especially fruits and vegey

5) Control of insect pest include the cost of production

6) Some insect pests act as vectors of plants diseases

7) Insect pests reduce the yield (quantity) and quality of crops either in field or store

**NAME OF PEST, MAJOR CROPS DAMAGED, NATURE OF DAMAGE.**

1) Termite (Macrotermes spp)

Major crops damaged: Tuber and cereal crops

Nature of damage: Adults eat both roots and stems of growing plant.

2) Cowpea leaf beetle (Podagrica uniforma)

Major crops damaged: Cowpea, yams

Nature of damage: Adults make holes in the cowpea leaves.

3) Army worm

Major crops damaged: Rice, millet

Nature of damage: Worms eat all the leaves of the plants.

4) Locust (zonocerous variegatus)

Major crops damaged: Cassava, Maize

Nature of damage: Adults eat both stem and leaves

5) Crickets

Major crops damaged: All vegetables

Nature of damage: The Roots and the stem are eaten up by the nymphs.

PIERCING AND SUCKING INSECTS

1) Mealy bug

Major crops damaged: Cassava

Nature of damage: Viral diseases are transmitted by the adults.

2) Aphids

Major crops damaged: Maize, Groundnuts

Nature of damage: Diseases are transmitted and plant later die.

3) Cotton stainers (Dysedercus superstitious)

Major crops damaged: Cotton, Okro

Nature of damage: Diseases are transmitted, and fruits are dried.

4) Thirps

Major crops damaged: Cowpea, Cocoa

Nature of damage: Flowers and leaves are destroyed.

PREVENTION AND CONTROL OF INSECT PESTS

Generally, insect pests can be effectively controlled through the following measures

1) Cultural control

2) Physical control

3) Chemical control

4) Prohibition

5) Quarantine

6) Biological control

CULTURAL CONTROL

This involves the use of good cultural practices in order to reduce or destroy insect population and to help crops escape insect’s attack. These cultural practices include:

a) Crop rotation

b) Tillage

c) Early planting

d) Planting resistant varieties

e) Timely harvesting

f) Burning

PHYSICAL CONTROL

This involves the physical removal of insect pests from the farm through:

i) Hand picking

ii) Air tight storage

BIOLOGICAL CONTROL

This involves the introduction of the natural enemies of the insect pest. The pests’ enemies are introduced to feed on the insect pests thereby reducing the population of the pest. For instance, lady birds are introduced in aphid infested farm to control aphids

CHEMICAL CONTROL

This is the use of chemicals to protect crops from insect attack and if the attack is established, they are used to kill the insect pests at various stages of their life cycles. Chemical control is the most effective method of controlling insect pests and chemical used for insects’ pests include

a) Insecticide: These are chemicals specifically used for controlling insect pests on the farm.

b) Fumigants: These are insecticides in form of vapour. They are usually enclosed in air tight containers e.g. hydrogen cyanide, ethylene, etc.

Other forms of pests include birds, man, monkeys, ruminants, etc.