**THE FEDERAL UNIVERSITY, KASHERE**

**FACULTY OF AGRICULTURE**

**DEPARTMENT OF ANIMAL SCIENCE**

ANS: 2202

Course Code: ANS 2202

Course Title: Principle of Animal production

No of unit: Two

Course Duration: Two hours

Status Compulsory

Prerequisite: Nil

Course instructor: M.S. Sadiq A.I maigado

Department of Animal science

Phone: 08036954296

Email:msskumo@gmail.com

**Course description**

This course is very important for profitable animal production. This stems from the fact that a

Good understanding and judicious use of knowledge acquired from this course would lead to

understanding of livestock production.

**GRADING SYSTEM FOR THE COURSE**

This course will be graded as follows:

Class Attendance In form of random quizzes 10%

Assignments 10%

Test(s) 20%

Final Examination 60%

**TOTAL 100%**

***Attendance:*** It is expected that every student will be in class for lectures and also participate in all practical exercises. Attendance records will be in the form of random quizzes to determine each person’s qualification to sit for the final examination. In case of illness or other unavoidable cause of absence, the student must communicate as soon as possible with the instructors, indicating the reason for the absence.

***Academic Integrity:*** Violations of academic integrity, including dishonesty in assignments, Examinations or other academic performances are prohibited. You are not allowed to make Copies of another person’s work and submit it as your own; that is plagiarism. All cases of Academic dishonesty will be reported to the University Management for appropriate sanctions in Accordance with the guidelines for handling students’ misconduct as spelt out in the Students’ Handbook.

***Assignments and Group Work:*** Students are expected to submit assignments as scheduled. Failure to submit an assignment by certain student as at when due will earn such student zero for that assignment. Only under extenuating circumstances, for which a student has notified the instructor in advance, will late submission of assignments be permitted.

***Code of Conduct in Lecture Rooms:*** Students should turn off their cell phones during lectures. Students are prohibited from engaging in other activities (such as texting, watching videos, *etc*.) during lectures.

**Introduction**

**Historical Development of Livestock and Poultry**

Livestock and poultry became important readily available to human through the process of domestication; domestication brings about an entirely different animal species which became naturally accustomed to living among humans in a quite beneficial relationship. **Domestication of animal** is defined as the process of heredity reorganization of wild animal into domestic form according to the interest of human being.

**Problem Facing Animal Production:**

1. **Inadequate Finance:** Most livestock owners are poor and cannot purchase modern machine and implements; hence they do not operate large animal farms. High interests’ rate on loans charged by banks and the administration bottle neck make access to credit facilities difficult; poor and non payment of loans by farmers prevent further granting of loans.
2. **Poor Land Tenure System:** Traditionally land is shared among family members leading to land fragmentation it therefore difficult to acquire large hectare of land for animal production.
3. **Unfavourable Climatic Condition:** Excessive rainfall leads to high humidity thereby leading to rapid multiplication of livestock pathogens. High temperature causes stress which may result into abortion, drop in egg and milk production; wind aid in spread of animal disease.
4. **Disease Infestation:** Spontaneous incidence of disease outbreaks causes sickness and deaths of farm animals’ e.g. Avian influenza (birth flu) causes death of birds in large numbers.
5. **High Pest Infestation:** Pest transmit diseases from one to another, pest reduce the quality and quantity of animals and their products it lead to economic loss.
6. **Low Level of Technical Know**-**how**: There is low acceptance of new methods of production because of low technical-know-how of livestock farmers which lower production.
7. **Social Cultural Constraints:** Religion beliefs, norms and taboos of some people may limit production of certain farm animal e.g. Muslims and Jews will not eat pork for religious reasons.

**Solution to the Problems of Animal Production:**

1. Loans should be provided for animal Production with enough moratoriums (time when repayment is not made) to allow for the mature period of the project; interest on loans should be low.
2. Good quality stock, proper housing and health care as well as processing and storage facilities should be provided.
3. Feed should be provided in term of quality and quantity at the appropriate time.
4. Livestock production knowledge and experience is necessary to keep animals that are adapted to a particular locality.
5. Literacy of animal farmers should be improved, extension work should be trained and encourage to disseminate information, farmer should be able to reads labels on drugs, feed and they should record activities on the farm.

**Breed of Farms Animals**

A breed can be defined as a group of animals that has Common ancestors and are similar in characteristics like colour, height, weight at maturity, feed conversion etc. Breed is different from types; the type of animal is the production expected from a breed; for example there are beef type cattle, dairy types, in poultry there are layers and broilers.

**Breed of Chickens**

1. White leghorn (good layers)
2. Light Brahma
3. Rhode Island red
4. Crosses
5. Shika brown
6. Anak

**Breed of Turkey**

1. Turkey Bronze
2. White Holland (local or indigene)
3. British united turkey
4. Crosses etc.

**Ducks Breed**

1. Pekin
2. Indian Runner
3. Crosses
4. Aylesbury etc

**Breed of Pigs**

1. Duroc
2. Yorkshire
3. Berkshire
4. Hampshire
5. Poland China
6. Indigenous breeds are characterized by small size, long snout various colour, slow maturity.

**Breed of Rabbits Breed of Horses**

1. Flemish Giant i. West African barley
2. California white ii. Western Sudan Pony
3. New Zealand white iii. Arabian
4. New Zealand red iv. Belgian
5. Chinchilla v. Russian Trotter
6. Angora vi. Frisians
7. Rex vii. Crosses etc.
8. Lop
9. Dutch etc

**Bread of Camels**

1. Dromedary single hump
2. Bacteria double hump

**Breed of Goats Breed of Sheep**

1. Maradi (Red Sokoto) i. West African Dwarf
2. West African dwarf ii. Yankasa
3. Boer iii. Balami
4. Nubian iv. Uda
5. Boran v. Togolese
6. Borno White vi. Crosses

vii Bauchi types vii. Barbary

Viii Kano brown viii. Awassi .etc.

ix Crosses etc

**Breed of Cattle** Classified into two groups

1. Bos indicus (humped)
2. Bos tarus (humpless)

**Classification of Cattle based on Function**

1. Beef cattle (meat producer)
2. Dairy cattle (milk producer)
3. Dual-purpose (meat and milk producer)
4. Work or draft type

**Beef Breed**

1. N’dama
2. Maturu
3. Zebu
4. Sokoto Gudali
5. Keteku
6. Red bororo
7. Hereford
8. Crosses
9. Brownswiss
10. Holstein Friesian

**Characteristic of Major Breed**

1. **White Fulani:** It is large white animal with black erect ears and medium size horn curved outward and inward, the coat colour of white fulani is commonly white on a black skin with black ears, eyes, muzzles, hooves, horn tip and tip of tails.
2. **Sokoto Gudali :** It is a big animal with uniformly grey or cream colour with darker spots around the shoulders. It is short legged cattle with short horn that is sometimes effectively absent, dewlap skin fold are well developed they are docile hence can be adapted for work or draft.
3. **Red Bororo:** It is very large bodied breed of cattle with deep burgundy coloured coat; it is characterized with pendulous ears and by thick horns.
4. N’Dama: It is brown humpless cattle with little or no dewlap from Sierra Leone, Guinea, and Senegal. The bulls may weigh up to 600kgg. They are not docile but resistant to trypanosomiasis.
5. **Muturu:** it is a small bodied animal with blocky conformation and compact body. It’s a humpless animal with a straight back as a broad head. Muturu is generally black or black as white.i.e. mean height is about 1 metre, it weight up to 200kg at maturity.
6. **Brahman: -** This is exotic humped cattle that can weigh up to 1,200kg.
7. **Brownswiss:** (exotic bread weight 600-900kg, they are solid brown.
8. **Hereford:** Native of England, white face, medium to rich red body coat.
9. **Holstein Friesian**: exotic good milker and good for crossing local breeds to enhance milk production of local breed.

Differences between beef and dairy cattle production

|  |  |  |  |
| --- | --- | --- | --- |
| **S/N** | **Dairy Cattle** | **S/N** | **Beef Cattle** |
| 1. | Milk is the main product | 1. | Flesh is main product |
| 2. | Requiring high capital | 2. | Less capital is require |
| 3. | Required high amount of concentrate feed | 3. | Can be feed on roughage may |
| 4. | They are good converter of feed to milk | 4. | They are good converter of feed to meat |
| 5. | They are more feminine | 5. | They are more muscular |
| 6. | Require very efficient skilled management | 6. | They require less skill in management |
| 7. | A good dairy cow has a triangular conformation when viewed from above | 7. | Has a blocky conformation when viewed from above. |

**System of Livestock Production**

There are basically three system of production they are:

1. Extensive system
2. Intensive system
3. Semi intensive
4. **extensive System:** This system of production entails keeping of animals on the open range, the system is mostly practice by Fulani, the animals are left to search for feed on their own, while they came back home at night to sleep under any available shed as no special housing unit is usually provided. Under this system the Fulani moved with their livestock from North to South in search of feed and water. The system is cheap as there is little or no cost of establishment, feeding, medication and housing, but loss due to accidents, predators and theft is high under this system.
5. **Intensive System:** This is types of system of animal production in which the environment is controlled and animals are properly monitored when confined. Housing is well constructed animal health, performance, productivity, quality of animal product and economic benefit are main point of this system of animal production. The population of livestock under this system is about 3%. Animals go out to graze on pasture in the morning and evening however they return to their housing, there are provided with concentrate, feed, water and salt leak. Animals are protected from environmental hazards and inclement weather, but it involves very high financial outlay for housing, feeding, medication and provision of equipment.
6. **Semi-intensive System:** This system is partly extensive and intensive, the animal are allowed to roam, a suitable housing is provided at night while the farmer provides, some feed in form of kitchen wastes and grains milling by product, some animals are kept under this system by what is known as mixed farming, some livestock owners might take their cattle out during the day and bring back to their pens in the evening.

**Feeding Habit of Farm Animals**

Feeding is the act of consuming food or the act of supplying food and nourishment. Herbivores such as rabbits, sheep, goat, cattle, camels, horses, buffaloes, grass cutter etc generally thrive on forage diet, but feeding a supplement (grains or concentrate) ensures that the animals receive the entire nutrient that they need.

**Feeding Ruminant**

Cattle, sheep and goats are classified as ruminant animal which possesses complex stomach which is divided into four parts namely; the rumen, the reticulum, the omasum and the abomasums. The rumen and the reticulum form the larger parts of the stomach and have a temperature of 39-400C and pH 4.5-7.0. It is the home of large number of micro-organism which gives the rumen the ability to digest cellulose and the ability to use non-protein nitrogen like urea and raw material for protein synthesis. Also, the micro-organism gives the ruminant the characteristic to exist without dietary sources of B-complex and vitamin K. Therefore, ruminant can survive on low protein and high roughage; they chew the cud by a process known as **rumination** it involves sending back for bolus of feed for regurgitation, rumastication and reswollowing. poultry, rabbit and pigs are known as **monogastric** animals they possess a single stomach hence they can handle very limited roughage, the rabbit has an organ known as **caecum** this caecum contain microbes which aid in handling fibrous materials the rabbit practice what is known as **caecatrophy,** this involve recycle of faeces from anal area to the mouth. Sheep and goat are inquisitive feeder because they consumed normally everything it come their way.

**Principle of Breeding and Livestock Judging**

1. Mating system
2. Types of breeding
3. Selection

Breeding it involve transfer of heritable character that are of good quality from parent to offspring, there are basically three types of breeding.

1. **Inbreeding:** This involve the breeding of closely related individual e.g. brother and sister it is aim of maintaining the particular gene a family, under this system recessive gene with hitherto are dominant in number.
2. **Out breeding:** This involves breeding two individual of the same breed that are distinctly related e.g. second cousin by second cousin this aim to introduce new gene to the family.
3. **Cross breeding:** This involves breeding two individual of different breed, it is aim at improving the genetic potential of the animal, it also improves hybrid vigour, and it subdivided into four.
4. **Two breed crossing:** e.g. cross between light strain and heavy strain of poultry.
5. **Criss Crossing:** This otherwise known as two breed rotation, it is involve use of two difference breed of animal in alternate generation.

A B C

Hen Cork Cork

AB

Offspring

ABC offspring

1. **Triple Crossing:** It followed the same format but it differs in the sense that you have three breed if animal it otherwise called triple way rotation.
2. **Multiple Crossing:** This involve the use of many breed of male animal otherwise known as **multiple breed selection**

**Selection:** this is involve selection of animal best on some certain characteristic of your choice e.g. calving rate, calving interval, feed conversation efficiency, disease resistant.

**There are three types of Selection**

1. **Natural Selection:** As the named implies selection is done naturally with no human influence.
2. **Artificial Selection:** This is under the control of man, selection is best on certain characteristic e.g. free from diseases, meat or milk production.
3. **Mass or Individual Selection:** This involves keeping the animals in large number in farm or house, then select the best of certain phenotypic character (physical expression).
4. **Individual:** This is best on history of the animals a good knowledge of the animal predecessor or ancestor is very important under this system.

**Principle of management of difference types of Farm Animal**

Management is the art and science of combination of ideas, facilities, processes and materials and labour to produce and market a worthwhile product or service successfully. in animal production it refer as feeding, housing, health care and other activities geared toward promoting the comfort of the animal for the purpose of production and marketing to realise target objective.

Management systems in animal production refer to different ways of raising or rearing farm animals which are function of:

1. Wealth
2. Climate
3. Feed
4. Social factor
5. Types of animals

**Management of Poultry**

**Some terms:**

* **Day old chicks:** chick just hatched on the day or two.
* **Broiler:** raised purpose for meat.
* **Point of lay:** hens that are about to commence lying egg.
* **Pullets:** A young hen that has not commenced laying eggs.
* **Cockerel:** A young male chicken that has not been castrated (4-12 month old).
* **Rooster:** It is a matures male chicken (above 12 month old).

The management of poultry is in stages, for broilers we have the brooding stage and the finishing stage, the brooding stage last for 3 - 4 weeks where as the finishing stage last for 4-8 weeks. However in layers the growth is subdivided into three, the brooding stage, growing stage and the laying stage, brooding last for 4 - 6weeks, growing last 6 - 12weeks and laying stage 18 weeks and above.The brooding stage is the most critical stage in poultry production, because at this stage the chick are yet to develop their thermo-regulating organ and as such the need to provide with adequate heat this stage does not require plenting space depending on the number of chicks. The chick needs special care that includes the provision of feed and water in addition to heat, a brooding room requires equipment which provides condition similar to those provided by the mother hen under natural brooding condition, the room suppose to be made from block with enough ventilation, the sources of heat could be from electric bulb, kerosene stove, behavioural of the chick determine the adequacy of the heat, when the chicks crown themselves ground the sources of the heat it means the heat is not adequate, when the chick are evenly distributed this show that the heat is adequate, but when the go away and huddle far from the source this show the heat is too much.

**The growing Stage:** The care, attention and monitoring given during chick stage should be continued at the growing phase however environmental temperature required for growers is less than that of chicks because at this stage they would have developed feather for insulation or heat regulation. They need ventilation more than the chicks growers must provided with adequate quantities of feed that is balanced for energy, protein, mineral and vitamin, crude protein of 15-16% and energy of 2400-2600-kcal/kg of feed should be feed at this stage.

**Laying Stage:** Layer should keep under a restricted feed condition with a view to avoid the deposition of fat along their reproductive part so as to avoid the breaking of egg when they come to lay as must as possible. Laying flocks may be kept on the floor (deep litre system) or in cage (battery cage system) the battery cage system is more popular in the humid area of Southern Nigeria, while the deep Littre system is preferred in the Northern Nigeria, to lay a good number of eggs per day the chicken must be provided with adequate quality and quantity of feed. Assignment Read on Broodiness, moulting, culling.

**Management of Sheep and Goat**

Sheep and goat play an important role in the socio-economic life of the people in Nigeria, and also make a significant contribution to the national economy, they constitute about 35% of national meat supply. The survival of sheep and goats depend largely on its management even before birth. Management encompasses total care given to an animal or a group of them in order to enhance (their) productivity and survival.

There are basically three systems of small ruminant production in Nigeria there are **extensive, intensive and semi-intensive**. The most predominant mode of practiced in rural areas is the **extensive production system** where animals are left to fend for themselves through scavenging as browning available feedstuff in the village. Usually animals are not followed during their grazing period in the day time. However, animal return to owners homesteads at the end of the day where occasionally they are supplement with household waste such as grain brains and other non-conventional feedstuff. Housing is not often provided especially where animal numbers are under (10). **The semi-intensive system** involves the provision of housing and improved feeding for animals after animal have grazed on the range during the day. While intensive involves the total confinement of animals (zero-grazed) where feed, water, housing are provided.

**Care and Management of breeding stock**

Management System of Cattle is the same as in sheep and goats, all the three system of production exist.

**Bull:** The management of bull on a farm is very vital, if most of the cattle settled on a good rangeland one bull can be use to breed at least 20 cows, on a fairly rough land of pasture a bull can be used to serve about 15 cow, however, in a extremely good pasture condition with continues availability of feed and water and also high technology just as in develop world, one bull can serve up to 50 cow, it is very important to keep the bull in a restricted level feeding, but most gain some weight at the beginning of the breeding season. This is because excessive fat bulls are very lazy and sexually in active, so you don’t feed them well. A bull should be used for breeding at an age that is not less than 2 years, bull that are less than two year should be used for restrict service on heifers, a breeding bull can be used for breeding continuously for above period of ten years. However it should be removed and replaced by his offspring to avoid inbreeding, a breeding bull must be fertile, the bull are suppose to be kept away from the cow unless during the onset on breeding season.

**Management of Cow:** A cow is suppose to be kept on a good condition are not expose to high level of nutrition a breeding cow is suppose to be flushed few weeks to the breeding season i.e. flushing help in production of two reproductive hormone.

1. Follicle stimulating hormone (FSH)
2. Leutenizing hormone (LH)

These hormones help in ovulations. A breeding cow can be use for breeding at the age of two years so that it age first calving could be about three years, the breeding cow should be regularly deworm, dip and sprays in order to avoid worms’ infestation. The nutrition of the breeding cow should be increase at least two month to the pregnancy. This phenomenon is known as **steaming up**. It is normally done to enable the animal to withstand the stress of giving birth and lactation.

**Sign of giving birth (Pasturition)**

1. Nervous less
2. Restless
3. Enlargement of udder
4. Relaxation of the pelvic ligament

**Management of Calve:** A soon as the calve is born the cow will begging to leak it with a view to removed all membrane and mucous around the body of the calve and the nostril in order to facilitate breathing, in a situation where the cow suffer from dystoxia, it might not leak the calve in such situation the calve as brought close to cow, close to it head to enable her to leave the calve. Experience has shown that some first calver may neglect their calve after birth in such case you sprinkle concentrated on the body of the calve to enable the cow to leak the calve or you can use towel to brush membrane and mucous on the calve.

The calve start suckling few minute after parturition, it is very important to allow the calve to suckle the milk that came out for the first four day. This is because milk contain yellowish substance called colostrums that contain antibiotic (antibody) with assist the calve fighting disease.