AGRICULTURE

Created by TEMANO

FORM 1

MOISTURE AND RELATIVE HUMIDITY

Moisture affects quality of vegetables with wilt and shrink under high moisture they may decay -

The moisture level in the storage therefore should be in medium level - AERATION

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- **In order to keep the storage room under constant temperature air should always me circulated - LIGHT**
-
- **Vegetables should be stored in the dark or in a place of reduced lighting**
- **CLASSES OF LIVESTOCK**

Ruminants

Non-ruminants -

- **RUMINANTS**

- **This are animals that are able to digest fibrous foods (eg.maize cobs)**
- **Examples of ruminants**
- **Cattle**
- **Goat**
- **Hare**
- **Fibrous foods have a large amount of cellulose for example straw ,maize stalks**
- **Ruminants animals eat and swallowed their foods and therefore regurgitate it back into the mouth for chewing**

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NON-RUMINANTS

This are animals which are not able to digest the fibrous foods
Examples are Pigs, poultry

DIGESTION IN RUMINANTS

Ruminants are animals which regurgitate and chew cub
Chewing, the cub is refer, to as rumination hence they are called ruminants

Digestive in ruminants

RUMEN

Occupies 80% of stomach

Store food temporally

Passes food into reticulum

Converts cellulose material by enzyme celluloses into fatty acids for example acetic acid, butyric acid Carbon dioxide is released by fermentation process

RETICULAM

Occupies 5% of stomach and it is the smallest

It traps many solid objects (such as nail, paper sticks or piece of metal)

It separate large particles to be regurgitated and white finer particles are pass into OMASUS

OMASUS

Occupies 7% of stomach

Has thick walls

It absorb, water from the food that comes in

It also strains food further before passing it on the abomasum

ABOMASUM

Occupies 8% of stomach and it is similar to mono-gastric stomach

The digestion passes by enzymes that take place here are similar to those in non-ruminants

DIGESTION IN NON RUMINANTS

Non-ruminants or mono-gastric animals are such as pigs and poultry and they have single stomach and their digestive system consist of oesophagus , stomach , large intestines and small intestines

DIGESTION IN PIGS

A pig has the following digestive system

- **Colon**
- **Pancreas**
- **Rectum**
- **Caecum**
- **Small intestine**
- **Gall bladder**
- **Liver**
- **Esophagus**

STOMACH

- **Food is mixed with gastric juice the juice contain enzyme pepsin and renin**
- **Renin is very important in digestion of piglets**

DUODENUM

- **The pancreas produce pancreatic juice**
- **The bile is produce from gall bladder it provide nature and emulsification of fats**
- **Tryspin amalyse speed up the hydrolysis of starch**

SMALL INTESTINE

- **Digest various food stuff**
- **The absorbed food stuff are metabolized to release energy**

DIGESTION IN POULTRY

Birds have no teeth for chewing into small particles

Digestion system of poultry we have (oesophagus , proventriculus ,crop , grazzards , pancreas , caeca , small and large intestines and cloaca

CROP

The oesophagus ends in crop which is a thick walled chamber and food is directly swallowed into the crop and store and being softened by secretrons produced by crop glands , small organ below the crop receive the food and pushes it into the gizzard

GIZZARDS

The gizzard has muscular wall and contains grit that is small stones

Through the movement of muscular walls of gizzard help to grid the softened food

SMALL INTESTINES

Digestion of food in birds completed in the small intestines

The end products are absorbed into the blood stream

Bird have pair of caeca which contains micro-organisms that digest vegetables

The rest of undigested food are passed onto the large intestines to be excreted by anus

DIFFERENCES BETWEEN RUMINANTS AND NON-RUMINANTS

Ruminants are able to digest cellulose whereas non-ruminants cannot digest cellulose Ruminants regurgitate and chew whereas non-ruminants cannot regurgitate

IMPROVING AGRICULTURAL PRODUCTION

Raw material related to agricultural

Fresh milk – butter

-cheese

- **cake**

Sorghum = chibuku

-thobwa

Maize = flour

Potato= cheese

DISADVANTAGE OF GROWING AND REARING ANIMALS USING TRADITIONAL METHODS

-It has low yields

ADVANTAGES OF IMPROVING AGRICULTURAL PRODUCTION

- **The country has enough food It saves foreign exchange**
  Development of local industries
  It generate income for famers
  It also earn foreign exchange

-WAYS OF IMPROVING AGRICULTURAL PRODUCTION

- **crop hsubundry practice**
  Animal husbandry practice
  Land husbandry practice
  Farming technology

CROP HUSBANDRY PRACTICE

- **Early land preparation**
- **The best time is soon after harvesting when the soil is still moist**
- **It is easy to produce humas**
- **Humas improve soil fertility**

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- **EARLY PLANTING**

- **Plant with first rain**

ADVANTAGES

- **Plant s grow fast because they make full use of rain water and humas(nitrogen)**

PLANTING IMPROVES FEEDS OF PLANTING MATERIALS

- **There is a good crop growth and development**
- **-This result high yields**

- **TIMELY WEEDING**
- **Crops grow healthy because plants make full use of plants nutrients and sunlight - This improve nutrient status of soil**

CROP ROTATION

-Reduce pest ad diseases
-It in riches the soil because some crops fix nitrogen in the soil

CONTROLLING PEST AND DISEASES

This should be controlled because it affects
-quantity of the yields
-quality the of yields

LAND HUSBANDRY PRACTICE

Avoid cultivating on steep slope for example river banks , streams
Making ridges across slope

ANIMAL HUSBANDRY PRACTICE

Selecting good animal breeds

Doing proper housing for animals

Proper and adequate feeding

FARMING TECHNOLOGY

USE OF FARM MACHINERIES

Plough

Ridger

Tractors

PRACTICING IRRIGATION

This help to harvest more than once in a year

It provide food during drought season

USE OF SEED TECHNOLOGY

It involves use of improved seed varieties than local seeds

It also improve seed and animals breeds

USE CROP STORAGE

Improve and modern helps to keep food away from pest ..e.g Rats Weavils ,termites

FARMING SYSTEM THAT SUPPORT THE GROWING POPULATION

FARMING SYSTEM

This is when the farmer organize plant and use of his or her resources

TYPES OF FARMING SYSTEM

1. **Extensive farming system**

    - **Involves use of low level of labours capital technology**
    - **This result in low yields**

EXAMPLES OF EXTENSIVE FARMING

Shifting cultivation – plot is abandoned when the soil is exhaused

Bush fallowing – land is left to gain soil fertility

Ranching - this involve raising few animals

Free range – raising animals by letting them find their own food

2. **Intensive farming system**

- **They use more capital**
- **They use less land**
- **It uses scientific knowledge**

NATURAL RESOURCES

- **Are materials that occur naturally within the environment and useful to humanity**

EXAMPLES OF NATURAL RESOURCES

Mountains
Rivers
Lakes
Air
GROUPS OF NATURAL RESOURCES

Renewable – resource that can replace naturally
Non-renewable –resources that cannot replace once it is used
NATURAL RESOURCES THAT INFLUENCE AGRICULTURAL PRODUCTION

WATER

1. **Rainfall**
2. **Surface water – in rivers and lakes**

IMPORTANCE OF WATER

1. Livestock production

- **Used for drinking**
- **Used for dipping animals**

2. For crop production

- **Used for seed germination**
- **For plant growth - Used for photosynthesis**

3. **Mixing with chemicals for farm use**

- **Some chemicals need to be dissolved in water for effective functioning**

4. **Cleaning building tools and equipment**

   Example
   - **Calf pens**
   - **Piggeries**

5. **Operating machines**

   - **Farmers who have installed water driven for grinding graphs and other function needs**

6. **Engine cooling system**

7. **Used in building construction**

8. **Home for aquatic animals**

SOIL

It is a thin layer that cover the upper parts of the earths crust and provide a medium for plant growth

IMPORTANCE OF SOIL

1.Plant growth -provides nutrients and root development

2.Production of food, timber and fibres which essential for human existence and economic property 3.It prevents pollution

4.Control flow of water and chemical substances

5.It contains micro-organisms

VEGETATION

Refers to all plants

Examples

Grass

Trees

Shrubs

Flowers

IMPORTANCE OF VEGETATION

1. It regulates the blow of water , carbon dioxide and nitrogen in the atmosphere

2. It responsible for the growth for the majority of water store in the binsphere

3. **contribute to the carbon dioxide because it reduces the amount of carbon dioxide in the atmosphere through absorbing it to manufacture food through photosynthesis**
4. **It affect the climate vapour level in the atmosphere –if there are many trees the amount of vapour increases and if they are few trees in decreases**
5. **Vegetation decomposes to form soil**

AIR AND WIND

Moving air is found between soil particles for organism that are found in the soil for respiration Livestocks require air for breathing IMPORTANCE OF AIR

1. **It increase evapotransiration and absorption of carbon dioxide in the soils**
2. **It affects plant both physiologically and mechanically**
3. **Strong wind cause plant so bend**
4. **Wind act as an agent of soil erosion**
5. **Wind also help I seed disposal**
6. **It also help in plant pollination**

SUNLIGHT

It sustain life and the basic of all energy consumed on earth

IMPORTANCE OF SUNLIGHT

1. **It provide light needed for plant**
2. **It helps in absorption of minerals by plants**
3. **Sunlight energy can be converted into solar energy**
4. **Sunlight is used to dry crops**

DEPLETION OF NATURAL RESOURCES

DEPLETE –Means decrease seriously or exhaust the abundance

RESOURCE DEPLETE –This means exhaustion of natural resources within a region

WAYS OF DEPLETING NATURAL RESOURCES

1. **Deforestration**
2. **Floods**
3. **Overgrazing DEFORESTRATION**
   -cutting down trees carelessly CAUSES

1. **Rapid population growth**
2. **Poor agricultural practices**
3. **Logging for wood fuels**
4. **Overgrazing EFFECTS**
    1. **Soil erosion**
    2. **Loss of habitat**
    3. **Climate change**
    4. **Failure to absorb green house gases**

IMPROPER USE OF CHEMICALS

EFFECTS

1. **Direct poisoning of livestocks , human beings and micro organisms**
2. **Contamination of farm produce chemical residues could affects food safety**

POOR FARMING PRACTICES

1. **Overstocking**
2. **Mono cropping**
3. **Failure to construct terraces**
4. **Cultivating the soil when it is too wet**

SOIL EROSION

This is the removal of top soil by the action of water and wind EFFECTS

1. **Farm operations –it is difficult to work with machinery**
2. **Exposure to sub soils –the sub soil is not reach in soil nutrients**
3. **Reduce farm productivity**
4. **Deposition of agricultural land – eroded material usually deposited low layin by running water**
5. **Water supplies**
6. **Floods**

CONSERVATION OF NATURAL RESOURCES

CONSERVATION

This means prevention of loss or damage of natural resources CONSERVATION MEASURES OF NATURAL RESOURCES

3. **Contour faming –means carrying various farm operations along the contour**

4. **Planting trees and grass**

   Ways of planting trees

   . afforestration

   . re-afforestration

5. **Use of fire breaks**

   Effects

   . fire can destroy plants

   . fire can kill soil organisms

6. **Applying manure**

7. **Constructing contour bunds**

8. **Mulching -this is convering of ground surface with materials**

   . it protect soil from direct impacts of erosive force of water and wind

   . improve infiltration of rain water

   . It also reduce the amount of run-off

9. **Terracing a**

= a terrace –is an ridges of the earth constructed across the slope

Ways of terracing

1 . Bench terracing

Under bench terracing we have:

. Excated bench terraces

.Developed bench terraces

2 .Ridge terracing

(a) Primary purpose is to conserve moisture

(b) Secondary purpose is to prevent soil erosion

10. **Making ponds**

Pond –is the water reservoir which may be natural or dammed

Uses of pond water

(a) Fish farming

(b) Drinking for animals such as cattle

(c) Used for domestic chores if water is properly treated

Types of ponds

1. **Embankment pond (natural pond)**
2. **Excavated pond**

10. Application of organic manure Importance (a) It improves soil nutrients

(b) It improve water holding capacity

(c) It improves calving and prevent water run off

11. Practicing zero or no till farming Importance

(a) Increases the amount of organic matter in the soil

(b) Reduces the cost of the nutrients (c) Prevents loss of top soil

BENEFITS OF NATURAL RESOURCES

(a) Respect and care for human life

(b) Improve the quality of life

(c) It reduces the depression of natural resources

(d) Farming activities are done or carried out within the land carrying the capacity

EFFECTS OF RAPID POPULATION GROWTH OR INCREASE ON NATURAL RESOURCES

1. **Exhaustion of natural resources**
2. **Food security**
3. **Shortage of land for cultivation**
4. **Environmental degredation**
5. **Deforestration**
6. **Overstretching of the resources**

POULTRY

CHICKEN PRODUCTION

BREED OF CHICKENS

They are group into two

1. **Local or indigenous breeds**
2. **Exotic breeds**

LOCAL OR INDIGENOUS BREEDS

ADVANTAGES

(a) They are hardly and low producers of eggs and meat

(b) They can survive under comparatively low levels of managements

(c) They are hard

(d) Easy to feed

DISADVANTAGES

(a) Their meat is hard

(b) They are small in size

(c) They don't lay many eggs

EXOTIC BREEDS

(a) They are high producers of egg and meat

. Types of exotic breeds -

Layers

- **Dual purpose birds**

NAME OF BREED	COUNTRY OF ORIGIN	DETAIL
Black Australorp	**Australia**	**Hard breeds** **Reared for both eggs and meat** **Lays between 180 to 200 eggs**
Rhode island	**America**	**Lay brown eggs** **It has a red or brown colour** **It has a big body**
Light sussex	**England**	**It is white in colour with a black neck** **It is a heavy bird**
New Hampshire red	**America**	**It has a tallow skin** **Lays brown eggs**
Oipington	**England**	**Lays brown eggs** **Very heavy** **Long body**

Australorp	**Australia**	**Lays brown eggs** **Have a white skin** **Have dark shanks**
Plymouth rock	**America**	**Large long body** **They are hard**
Leghorns	**Italy**	**They are very white** **Have yellow skin**

HYBRIDS –This are chicken that are produced by crossing two pure birds of chicken BREED ARE DONE FOR THE FOLLOWING PURPOSES

(a) Layers e.g for production of eggs

(b) Broilers e.g for production of meat

(c) Dual-purposes e.g for both production of meat and eggs INCUBATORS

-The chicks hatched are sold for farmers for commercial production of eggs

-The hatchers rear chick to maturity and produce eggs which they hatch - hybrids perform better than parents in both meat and egg production ADVANTAGES OF HYBRIDS

- **They lay more eggs**
- **They produce more meat**

POULTRY HOUSING

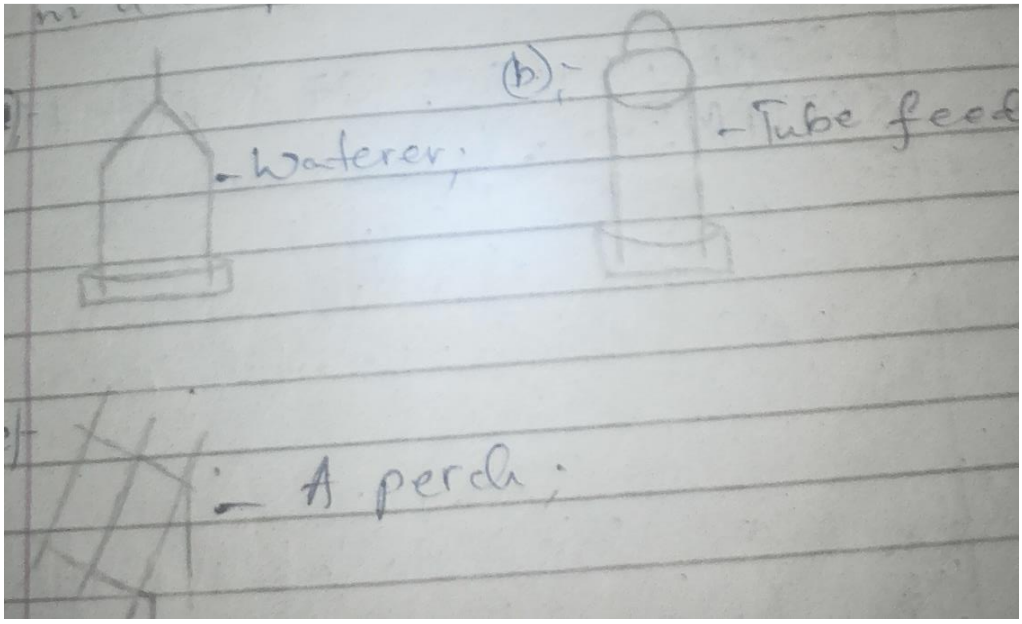
- **They should be well drained**
- **They should well-ventilated**
- **They should be protected from predators**
- **They should be a located away from wind to avoid bad odoer**

TYPES OF POULTRY HOUSES

2. DEEP LITTER POULTRY HOUSE

Below are equipment that are found in dip litter house

The house should have the laying boxes and perches for hens



ADVANTAGES

(a) Birds have easy access to feeds and water

(b) Birds have enough space

(c) Cleaning is minimal because litters accumulate down

DISADVANTAGES

(a) It is expensive

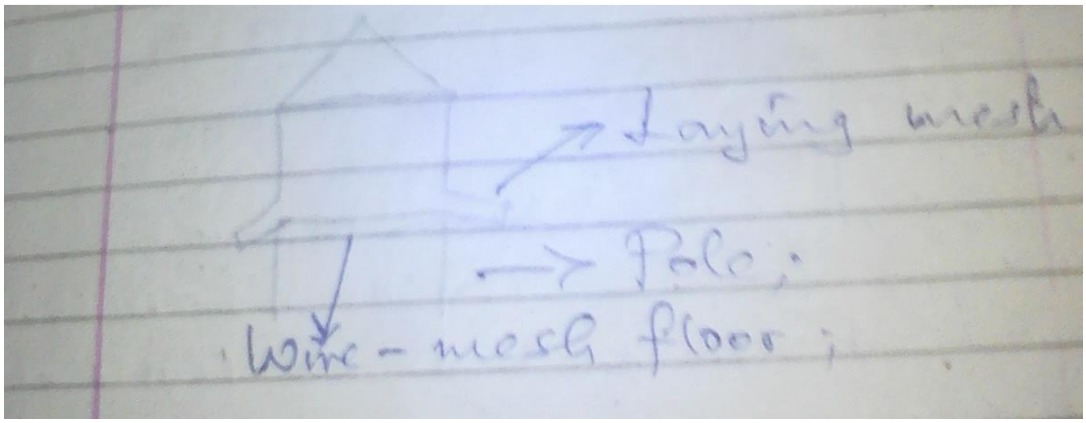
(b) Disease and parasite spread faster

(c) Difficulties to identify sick birds

(d) Cannibalism and egg eating may be a problem

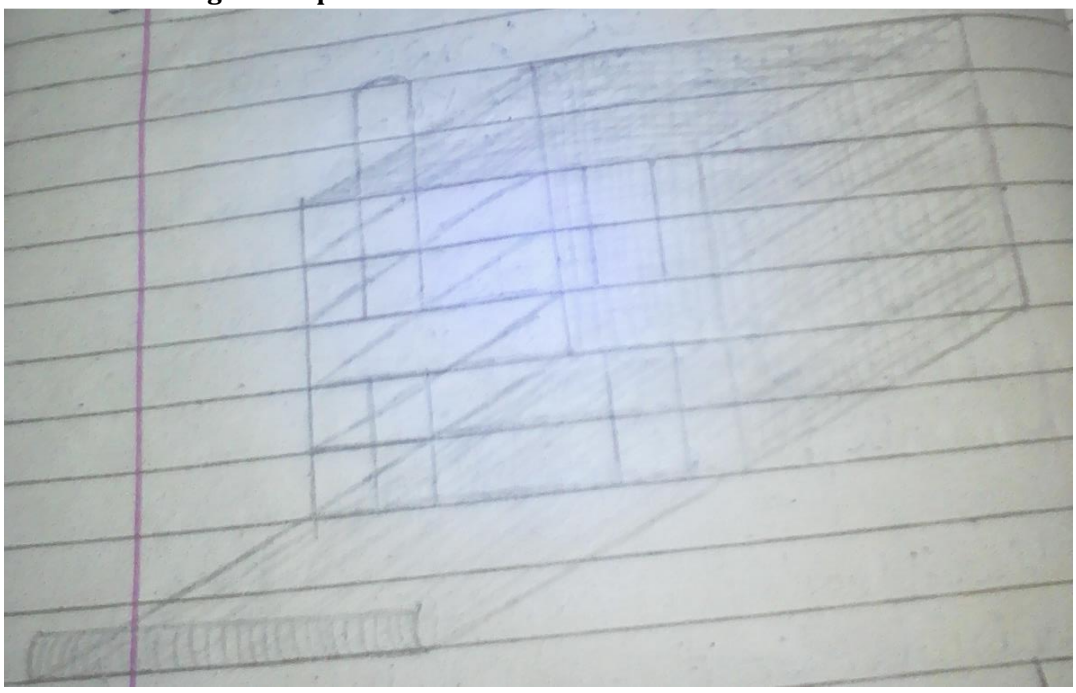
2. WIRE FLOOR HOUSING SYSTEM

- **The floor is made of a wire mesh raised about 1 metre above the ground**
- **The system does not require the use of litters**
- **Egg collection is done from the outside**



3. BATTERY OR CAGE SYSTEM

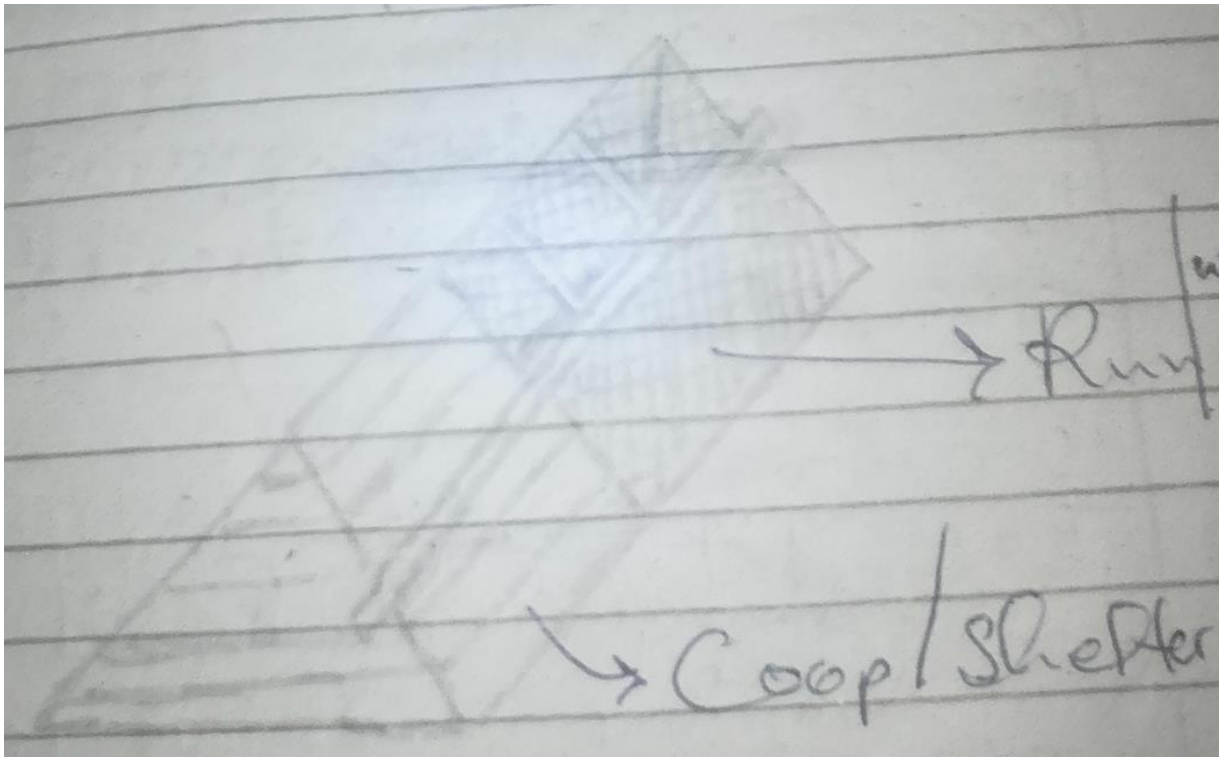
- **Is the system where birds are in cages arranged side to side**
- **Egg collection is done by hands**
- **A seed is a located per cage**
- **The size of the cage is 0.5 per hen**



4. FOLD OR ARIC SYSTEM

- **It has both run and the shelter sections**

- **The run provide the birds with space for birds to get natural vegetation and insects**
- **The shelter protect the bird from predators and bad weather conditions - A fold can carry 25 birds**



5. **POULTRY RUNS**

- **This is semi-intensive system which hens are allowed to feed on natural vegetation - Runs should be separately fenced to allow bird to be freely rotated**

6. **FREE-RANGE SYSTEM**

- **Chickens are kept indoors at night for security**
- **Chickens feed during the day - Very cheap method**

BROODING

- **Is the rearing of chicks from the time they are hatched up to when they are 6 to 8 weeks**

TYPES OF BROODING

- **NATURAL BROODING**
- **This when a hen rear her chicks after hatching**
- **ARTIFICIAL BROODING**
- **This is when chicks are hatched else where or by artificial means and they are reared by farmers**

BROODER MANAGEMENT

ARRIVAL OF CHICKS

1. **As soon as chicks are arrive on the farm , place them in the brooder**
2. **Give the chicks warm water in which there is glucose**
3. **Place the brooder mash (food) on the paper , make sure the papers are evenly spaced out the brooder**
4. **Besides the mash place on the papers you should put some mash in feeders in order to train the chicks to start feeding from the feeders**
5. **Ensure there is a guard /protection around the source of heat**
6. **Ensure all chicks hae adequate space**
7. **Ensure there is correct temperature in the brooder i.e it should not be too high or low**

BROODER MANAGEMENT

(a) **Temperature –temperature should be lowered slowly**

(b) **Space –adequate floor space is needed**

(c) **Litter –litter should be kept dry**

(d) **Lighting –lighting should be reduced from the third day**

(e) **Waters –water should be provided in open dishes prevent chicks from drowning (f) Ventilation – there should be adequate ventilation**

LAYERS

- **They are birds reared for egg production CHICKS**
- **They are raised in brooders**
- **They stay in the brooder for two weeks**
- **Chicks are feed with starter mash**

PULLETS

- **This are eggs that have nit started laying eggs**
- **In nine weeks the pullets are now given grower mash**

MANAGEMENT OF LAYERS

1. DE-BEALE M IN

- **It is the removal of mouth of chicken**
- **It is done to prevent egg eating and cannibalism**

2. FLYING CHICKENS

- **Some chickens in the flacle like to fly this is not good because they disturb other birds - Chickens can stopped from flying by clipping the feathers**
-

3. CULLING

- **The removal of un productive chickens**
- **Some layers do not lay eggs**
- **Unproductive hens should be removed because feeding is expensive**

4. EGG COLLECTION

- **Eggs should be collected many times a day**

5. FEEDING OF LAYERS

- **Plenty of water and nutrients should be given to the layers**

BROILERS

- **These are chickens kept for meat production**

BROILER CHICKS

- **Broilers are fed starter mash**
- **During five to six months they are feed on mash followed by finisher mash**

PARASITE AND DISEASES OF CHICKEN PRODUCTION

PARASITE (INTERNAL PARASITE)	DAMAGE	CONTROL
Round worms	Sucks digested food from intestines	- Keep house and equipment clean - Raising chicks away from older birds
Tape worms	Suck digested food from intestines	- Give chicks drug e.g phenothrazine
EXTERNAL PARASITE		
Mite , Ticks and Tampan	Suck blood from the skin (cause itching) Chicks become weak	- Dust feathers with pesticides e.g Gamatox - Wash legs with paraffin to control mites - Clean the house and equipments - Disinfect the house and equipments

Below are ... IN CHICKENS

i. - Tampan;

ii. -

- Tape - Worm;

iii. -

- Tick;

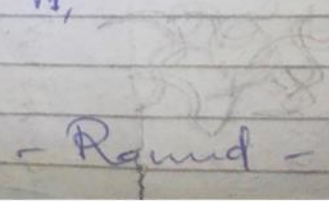
iv. -

- Louse.

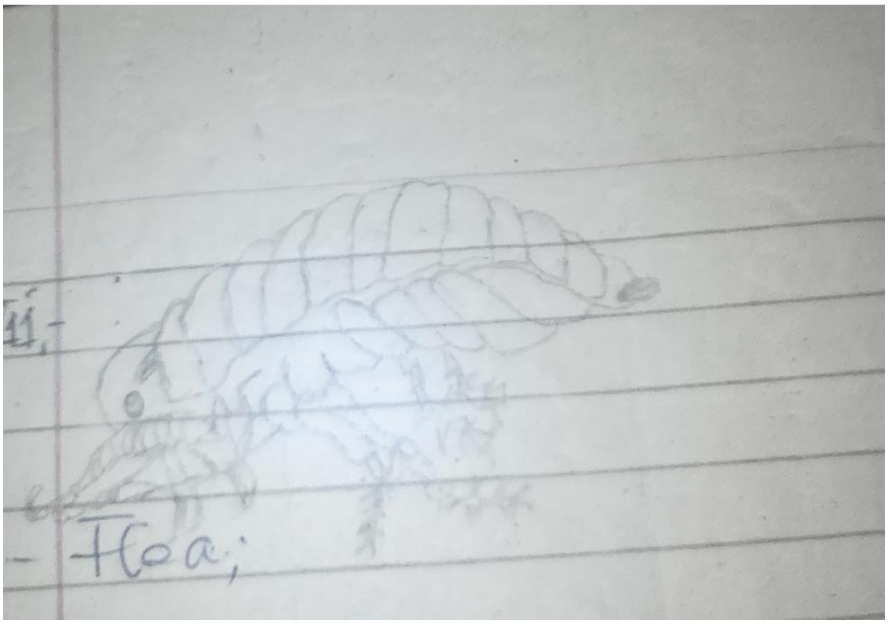
v. -

- Mite;

vi. -



- Round - Worm



DISEASES	CAUSE	SYMPTOMS	TREATMENTS
New castle	Virus –highly contagious Spread by air , dust and droppings	- Gasping, - coughing - head twisting - diarrhea - staggering and drooping	- No treatment - Kill all infected birds - vaccination
Gumboro or Infection bursal disease(IBD)	Virus –highly contagious Spread by air, dust and droppings	- death within a few days - yellowish diarrhea - stop eating	- No treatment - Kill all birds and disinfect the house - vaccination

Foal pox	**Virus –trasmitted by mosquito and liver worms**	- **blisters and wounds around the eyes** - **combs and wattle pus the mouth and throat** - **death in young birds**	- **No treatment** - **Kill and disinfect the house and wait several weeks before restocking** - **Vaccination at 3 weeks**
Coccidosis	**Protozoa**	- **Weaknes and weight** - **Loss blood in droppings** - **Affect young birds**	- **Treat with drugs contain Sulphur** - **Prevention ensure litter is kept clean and dry** - **Avoid overcrowding**
		-	-

The common predator of chicken are as follows

- **Dogs**
- **Foxes**
- **Hawks**
- **Eagles**
- **Ravens**

- **Alligators**

HOW TO CONTROL PREDATORS

- **Keeping some dogs to scare essentialthe predators**
- **Cleaning bushes around the house**
- **Choose a good housing system for chickens**

ESSENTIAL PLANT NUTRIENTS

- **Essential nutrients are which plants require for their proper growth and maintenance**
- **Essential plant nutrients are divided into two major groups** -

(a) Mineral nutrients
(b) Non-mineral nutrients

MINERAL NUTRIENTS

- **These are nutrients which plants obtain from the soil through their root e.g Nitrogen and Calcium**

NON-MINERAL ELEMENTS

- **These are nutrients that plants obtain from from the atmosphere especially air and water**
- **E.g oxygen , carbon , carbon dioxide , hydrogen**

Mineral nutrients are also group into two major groups

- **Macro-nutrients**
- **Micro-nutrients**

MACRO-NUTRIENTS

- **These are nutrients which are required by plants in large quantities e.g Nitrogen , Calcium , phosphorous ,Potassium , Magnesium and Sulphur**

MICRO-NUTRIENTS

- **These are nutrients which are required by plants in smaller quantities e.g Boron , Copper , Iron , Chlorine , Manganese , Molybedenum and Zinc**

USES OR ROLES OF MACRO NUTRIENTS AND THEIR DEFICIENCY

1. NITROGEN

USES

- **It is the componets of chlorophyll abd major contributor of the green to the colour in plants**
- **It promote vegetable growth which is important for vegetable crops**
- **It promote succulent texture which is important in some plants e.g melons and cucumbers**
- **It help in growth , production and in formation of proteins**
- **It regulates the availability of phosphorous and potassium SIGNS OF NITROGEN DEFICIENCY**
  (a) Stunted growth
  (b) Leaves turn yellow
  (c) In extreme cases leaves turn brown and die

2. PHOSPHORUS

- **USES OF PHOSPHORUS**

- **It is used in flowering , fruit and seed germination**
- **It helps in plant metabolic process e.g Respiration**
- **It accelerate maturation and ripening**
- **It is useful in imparting diseases resistance**

SIGNS OF PHOSPHOROUS DEFICIENCY

- **Premature leaves fall**
- **Poor and establishment and growth**
- **Tubers of root crop fall to let established and remain small and short**
- **Lateral buds become dormant reading to less brunching**

3. POTASSIUM

USES OF POTASSIUM

- **Its an activator of enzyme responsible for plant process e.g Translocation and Metabolism**
- **It regulates the opening ad closing of stomata**
- **It is used in growth of chlorophyll**
- **It improves uptake of nutrients from the soil**

SIGNS OF POTASSIUM DEFICIENCY

- **Leaves may curl**
- **Leaves are sarched at the edges**
- **Colourless of leaves**
- **Premature shedding of leaves**

4. SULPHUR

USES OF SULPHUR

- **It is used for plant growth**
- **It is used in synthesis of plant hormones e.g thiamine (vitamin B)**
- **It helps in development of chlorophyll**

SIGNS OF SULPHUR DEFICIENCY

- **Yellowing or white streakes running parallel to the veins e.g in Sugarcane - Chlorosis in leaves**
- **Monowing of steams**

5. MAGNESIUM

USES OF MAGNESIUM

- **It attract enzymes concerned with carbohydrates metabolism**
- **It is used in synthetic or oil componets in some crops e.g Soya beans, and Groundnuts**

SINGS OF MAGNESIUM DEFICIENCY

- **Inter-vein chlorosis of leaves**
- **Leaves eventually turn pure yellow leaves**
- **Leaves finally die**

6. CALCIUM

USES OF CALCIUM

- **It is used as a soil conductor i.e the additional of calcium**
- **It improves the aeration and water retention capacity of soil**
- **Plats need calcium for protein and synthesis and elongation of apical meristems and roots**

SIGNS OF CALCIUM DEFICIENCY

- **Proper growth and development of roots and terminal buds**
- **Leaves develop marginal chlorine**
- **Leaves curl up thereby reducing the photosynthetic area**

VEGETABLE PRODUCTION

TYPES OF VEGETABLES

- **Local vegetables**
- **Exotic vegetables**

Economic importance of local vegetables

- **They can survive under harsh conditions**
- **They are resistant to diseases and parasite**
- **They are locally processed**

Economic importance of exotic vegetables

- **They are source of nutrients**
- **They can be processed and canned**
- **Their seeds are found in shops**

Site selection for vegetables

- **Should be near water source**
- **Should be near market**
- **Should be easily accessible**
- **The garden should be in secure place**
- **Condition of the soil**
- **Avoid shady places e.g under tree**
- **Avoid site with obstacles such as roots from trees**

Construction of fence of a vegetable garden

- **A fence –is a farm structure that is used to control and separate different farm enterprises**
- **Fence protect the crops from damages**

Common type of fences are

(a) Chain link wired fence

- **Control chickens and other animals**

(a) Shade bet fence

- **Control flying pest and birds**

(a) Thatched fences

- **The grass thatched fence is the most suitable garden fence in Malawi because**
  . It is cheap
  . It is easy to construct
  . It uses locally available materials

HUSBANDRY PRACTICE IN VEGETABLE GROWING

(a) Nursery bed

- **It is the piece of land on which seed ling are raised until the time of transpranting**

(a) Seed bed

- **It is the land on which crops are finally grown**

STEPS TO BE FOLLOWED IN SEED BED PREPARATION

1. **Clearing the land**
2. **Tilling the land**
3. **Leveling the land**
4. **Mark out the bed**
5. **Applying manure and inorganic fertilizer**

PLANTING

Steps to be followed when seed are in nursery beds

1. **The vegetable seeds should be sown in shallow drill**
2. **Drill seeds in rows of 15 cm to 20 cm**
3. **Keep the soil moist but not water logging**
4. **After germinating thin to 7 cm apart to ensure strong seedlings**
5. **After sowing the seed should be covered with light layer of dry grass to conserve moisture**

TRANSPLANTING

- **Is the transfer of seedlings from the nursery beds to the seed beds**

USES OF THE FOLLOWING PROCEDURES WHEN TRANSPLANTING

- **Dig holes in the seed bed**
- **Apply manure at rate of two hand fall per hole and mix thoroughly**
- **Water the holes adequately**
- **Transplanting should start roughly after 3-4 weeks when seedlings 4-6 true leaves**

TOP DRESSING

- **Is the additional of the materials to the surface of the soil**
  E.g

Fertilizer
Manure

MULCHING

- **Is the application of materials to the surface of the seedlings**

E.g
Grass
Leaves

Importance of mulching

- **Conserve moisture**
- **Prevents soil erosion**
- **Suppress weeds**
- **Prevents temperature**

WEEDING

- **Is the removal of unwanted plants around the plants**

Involves
Cultural, mechanical ,biological and chemical methods

IRRIGATION

- **Is the application of water on the soil surface in areas which experiences less rainfall**

STAKING

- **Is the process of training a plant to stake in order to stability it**

Importance of staking

- **It improves access to sunlight**
- **It improves aeration**
- **It helps to keep fruits clean**
- **It prevents leaves from getting disease**

PRUNING

- **Is the removal of the unwanted parts of plant**

Importance of pruning

- **It provide high quality of fruits and vegetables**

PEST AND DISEASES OF VEGETABLES

PEST	DAMAGE	CONTROL
American bollworm	They feed on inner pats Allow fungi to enter to damage fruit They are brown , green and pink	Spraying insecticides
Tobacco whitefly	They suck plant sup Transmit visal disease	Applying insecticides

Red spider mite	**Feed on underside of leaves Yellow and spotting of tomato leaves**	**Spraying insecticides**
Diamond back moth	**Feed on lower surface of leaves Make holes**	**Spraying pesticides**
Cabbage sawfly	**It feed on entire leaf**	**Spraying pesticides**
Cabbage aphids	**Has waxy covering similar to cabbage leaves**	**Spraying chemicals**
Cut worms	**Feed on levels and cause leaves to fall They feed at night**	**Spraying pesticides**
Slugs	**Hid under leaves**	**Applying slug pellets**

DISEASES	CAUSE	SYMPTOMS
Early bright	**Fungi**	• **Spots on leaves** • **Portal defoliation** • **Premature fruits fall**
Damping –off diseases	**Fungi**	➢ **Drying of plant stems** ➢ **Plants falling down** ➢ **Plants dying**

HARVESTING OF VEGETABLES

- **Hand picking - tomato,**
- **Plucking – rape**
- **Uprooted – carrot**

STORAGE

- **Good storage is very important because vegetables are perishable**

  - **Temperature**

    - **Importance of use of refrigeration**

      - **Prevents vegetables from bacterial and fungal attack**
      - **Prevents respiration and metabolic process**
      - **Delay ripening and soften the fruit**
      - **Help in prolong of lifespan**

- **Pre-cooling**
  - **Is the process of rapidly removing field heat before storage**

    - **Importance of pre-cooling**

  - **Vegetables retain field heat when harvested**
  - **Heat reduce perishability of vegetables**
- **Moisture**
  - **Moisture affects quality of vegetables therefore in storage moisture should be medium**
- **Aeration**
  - **Air should always be circulated in order to keep storage temperature constant**
- **Light**
  - **Vegetables should be stored in dark or reduce light place**

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