MARAKWET WEST DISTRICT

443/1
AGRICULTURE
Paper 1
July/August - 2015
MARKING SCHEME

1. i)   aeration
    ii)   Drainage
    iii)   Water holding capacity/capillarity
    iv)   Stickiness/ consistency
    v)   Cation exchange capacity / soil PH / availability of soil nutrients.
            (Any 4 x ½ = 2mks)
2. i)   Variety of beans
    ii)   Rainfall pattern/ availability of irrigation facilities/ rainfall reliability
    iii)   Incidence of pests and diseases
    iv)   Expected harvesting time in relation to suitable weather or marketability
            (any 2 x ½ = 1mk)
3. i)   Use of sprinklers
    ii)   Use of hosepipes
    iii)   Use of watering cans   (any 2 x ½ = 1mk)
4. i)   Use of organic manure
    ii)   Growing of cover crops
    iii)   Crop rotation /fallowing
    iv)   Use of organic mulch
    v)   Use of Agricultural line /CAN
    vi)   Minimum tillage
    vii)   Cultivating when the soil moisture content is optimum   (5 x ½ = 2 ½ mks)
5. i)   Enables efficient coverage of plant with chemicals
    ii)   Creates unfavourable micro-climate for disease causing organisms
    iii)   Diseased branches (parts) are removed hence reduce chances of disease spread.
    iv)   Prevents lower branches (leaves) from touching soil hence avoiding infection
            (Any 2 x ½ = 1mk)
6. i)   Reduces run-off thus increasing amount of water into the soil
    ii)   Reduces evaporation thus increases amount of water retained by the soil
            (2 x ½ = 1mk)
7. i)   Saves time
    ii)   Reduces cost of production
    iii)   Maintains soil structure
    iv)   Minimizes soil erosion
    v)   Less laborions
    vi)   conserves moisture
    vii)   Minimises root disturbance   (Any 4 x ½ = 2mks)
8. i)   Training/ education of labour force
    ii)   Mechanizing farm operations / proper working tools
    iii)   Giving incentives eg proper housing, transport, bonus
    iv)   Supervision of labour
    v)   Assign specific tasks to workers
    vi)   Proper remuneration (proper payment)
    vii)   Assigning tasks according to skills   (any 4 x ½ = 2mks)
9. i)   Soil type
    ii)   Soil cover

iii)   Topography/ slope of the land

iv)   Wind speed / wind velocity/ wind strength

v)   Human activities eg overcultivation

vi)   Soil moisture content   (2 x ½ = 1mk)

10.   i)   Control weeds / pests/ diseases before application

ii)   Control soil erosion

iii)   Apply fertilizers in splits

iv)   Apply fertilizer at appropriate stage of crop growth to minimize volatilization and leaching

v)   Top dress when it is just about to rain/ apply on moist soil

vi)   Apply the optimum rate of fertilizer   (3 x ½ = 1 ½ mks)

11.   i)   Hydration

ii)   Hydrolysis/ solution

iii)   Oxidation

iv)   Carbonation   (Any 2 x ½ = 1mk)

12.   i)   Soil PH/acidity or alkalinity

ii)   Level of nutrient present in the soil   (½ x 2 = 1mk)

13.   i)   Farmer has freedom to make any development plan

ii)   Title deed can be used to secure credit

iii)   Farmer has incentives to conserve soil

iv)   Farmer can sell part of the whole land to settle monetary issues

v)   Reduces incidence of land disputes   (½ x 4 = 2mks)

14.   i)   Size/ weight of fruits

ii)   Cleanliness

iii)   Shape

iv)   Freshness

v)   Extent of pests/ disease damage

vi)   Colour of fruits

vii)   Wholeness

viii)   Moisture content   (½ x 4 = 2mks)

15.   i)   Allows production of many seedlings in a small area

ii)   management of the seedlings is easy

iii)   Facilitates planting of weak seedlings to become strong for transplanting

iv)   It is easy to provide optimum conditions for growth of the tiny seeds in the nursery

v)   One is able to select strong and healthy seedlings for transplanting

vi)   Excess seedlings can be sold to earn income

vii)   Reduces the time taken by the crop in the seedbed

viii)   There is less wastage of seeds as the likelihood of germination is very high
    (Any 4 x ½ = 2mks)

16.   i)   Have high germination percentage

ii)   Free from pests/ diseases

iii)   Are high yielding

iv)   Adapted to certain ecological conditions

v)   Breed true to type

vi)   Free from foreign materials

vii)   Free from physical damage

viii)   Right shape

ix)   Uniform in size   (4 x ½ = 2mks)

17.   i)   Slightly soluble in water / less liable to leaching / long residueal effect in the soil

ii)   Have a slight scorching effect

iii)   Easily fixed in the soil   (2 x ½ = 1mk)

18.   i)   Topography of the land

ii)   Condition of the land / physical condition of the soil

      iii)   Type of soil
      iv)   Depth of tillage desired/ type of crop to grow
      v)   Scale of operation/ size of land
      vi)   Capital available/ cost of the implement
      vii)   Skills of the operator/ technical know how
      viii)   Source of power available
      ix)   Time available before rain/ planting
      x)   Availability and accessibility of the implement   (4 x ½ = 2mks)

19.   i)   leaf chlorosis
      ii)   Leaf curling
      iii)   Mosaic eg cassava/ tobacco mosaic/ mottling
      iv)   Distortion / stunted growth/ malformations
      v)   Rosetting / excessive production of auxillary buds
      vi)   Excessive branching/ short internodes   (Any 4 x ½ = 2mks)

20.   The inventory for millennium farm as of 1st June 2010 was as follows;

Cash at hand	Kshs.5,000
Layers	Kshs.30,000
Dairy cattle	Kshs.120,000
Beans in store	Kshs.7,000
Calves	Kshs.15,000
Building	Kshs.75,000
Machinery	Kshs.95,000
Land	Kshs.200,000

On the same day the following information was obtained from the farmers records.

|	
Bank Loan	Kshs.213,000
Egg sales on credit	Kshs.10,000
Milk sales on credit	Kshs.13,000
Vegetable sales on credit	Kshs.5,000
Farm inputs purchase on credit	Kshs.19,800
Wages payable	Kshs.5,600
Taxes payable	Kshs.750
Cash in Bank	Kshs.20,000
Interest payable	Kshs.2,000

Prepare a balance sheet for the farm   (5mks)

Millennium Farm balance sheet as at 1st June, 2010

Credit / Assets ✓		Debit / Liabilities ✓	
Fixed Assets:	Kshs. Cts.	Long term Liabilities	Kshs. Cts.
Land	200,000	Bank	213,000
Building	75,000		
Layers	30,000	Current Liabilities:	
Machinery	95,000	Farm inputs	19,800
Dairy cattle	120,000	Wages	5,600
Calves	15,000	Taxes ✓	750

21.   Study the following diagrams of soil sampling and answer the following questions.
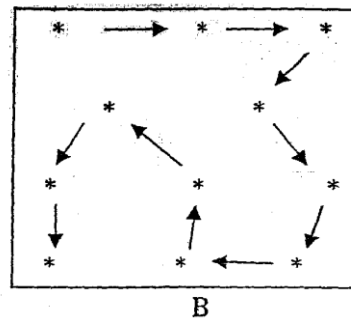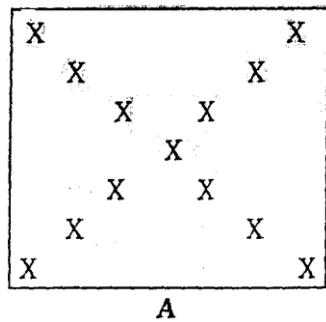
(a) **Give the procedures followed in;** **(1 mark)**

A - Traverse method/ diagnol

B - Zigzag method/radomn

(b) **Describe the procedure followed during soil sampling.** **(3 marks)**

- Clear the vegetation from sampling spots and make a vertical cut 15-25cm for arable land and 5cm for pasture land.

- The vertical slice is made using a soil auger, spade, or a panga.

- The soil is put in a clean polythene bag, bucket or any suitable container.

- The above steps are repeated in different parts of the field 15-20 spots depending on the sampling method used.

- Soil from all the spots is thoroughly mixed, dried and crushed.

- A sub-sample from the mixture is taken and sent to the laboratory for testing.

22. a) i) goose necked variety (½ mark)

    ii) Birds find it difficult to feed on bent panicle (½ mark)

    iii) Scaring the birds e.g. noise/scarecrow

    Poisoning

    Trapping

    Shooting/bombing

    Planting resistant varieties/brown red varieties not liked by birds

    Destroying breeding places (1 x 2 = 2 marks)

23. **a)** **Identify the weeds shown**

A – Double thorn (<u>oxygonum</u> <u>sinuatum</u>)

B – Thorn apple (<u>Datura</u> <u>Stramonium</u>)

C – Tick berry (<u>Lantana</u> <u>Camara</u>)

D – Wanderly Jew (<u>Cammelina</u> <u>benghalensis</u>) (½ mk each)

b) **One economic importance of each of weeds A and B**

A – cause irritation to farm workers and livestock during grazing (1mk)

B – It is poisonous to animals & human beings (1mk)

c) State the advantage of weed C on the farm

Can be used as a live fence (1mk)

d) Why is weed D difficult to control

- It is propagated vegetatively

- Its stems, leaves propagate vegetatively

- It has Rhizomes which enable it to propagate easily (2 x ½ = 1mk)

24. **i)** **Identify structure X and Y shown**

X – Plat structure/ platy soil structure

Y – Blocky structure / Blocky soil structure (½ mk each)

ii) X / Platy structure (½ mk)

iii) - Add organic matter / organic manure to the soil/ farm yard manure/ compost manure

- Add liming materials CaO, $CaCO_3$, CAN etc (1 x ½ mks)

25. **a)** **Describe the establishment of grass pasture from the time the land is ploughed using a mouldboard or Disc plough to the time the pasture is ready for grazing.(11mks)**

- Harrow the land to fine tilth;

- Done during the dry season / before rains.
- A Clean seedbed / weed free seedbed is desirable.
- Firm the seedbed using rollers before or after planting.
- Select the desirable variety of seed grass for the ecological zone of the area.
- Plant the seeds at the onset of the rains or just before the rains / early planting.
- Apply phosphatic fertilizers /SSP, DSP, TSP at planting time at the rate of 200-300kgms SSP/Hect
- Drill/broadcast the seeds evenly.
- Use the recommended seed rate for the variety or 1.5-2 kgms/ Hect. PGS or 10-15 kgms/Hect
Non-germinating seeds.
- Drug a twig or gunny bag to cover the seeds lightly/plant 3-5 times the diameter of the seeds.
- Control weeds by uprooting / applying a suitable herbicide.
- Apply nitrogenous fertilizers about 6 weeks after germination in split application.
- Cut back/practice light grazing in the initial stage of establishment to encourage lateral growth.
- Avoid grazing when the pasture is too young.
- Use certified seeds / healthy seeds.

(b) **What are the advantages of mixed grass-legume pasture over a pure grass pasture?**
(9 marks)

- It is more palatable than a pure grass pasture.
- Farmer has security against total loss due to attack by pests, diseases or bad weather.
- Mixed pastures make maximum use of soil nutrients because of different nutrient requirement
- Mixed pastures have better weed control effect
- Mixed pastures reduce soil erosion because of good coverage.
- Mixed pastures in crease soil fertility because of nitrogen fixation.
- There is economy in use of fertilizers in mixed pastures
- There is better distribution of growth in a mixture of early and late maturing species can be included in the mixture.

26. **a)** **Cultural Disease control measures in crops**

i) Use of healthy planting materials/ certified seeds during planting to prevent introduction or spread of crop diseases.

ii) Practising field hygiene / burning crop residue / rogueing/ clean weeding/ destroys (kills) disease causing micro-organisms/ destroys pests that transmit diseases.

iii) Proper seedbed preparation/ clean seedbed for the control of armillaria root rot in tea and coffee.

iv) Proper spacing to control damping off in cabbage seedlings in the nursery or rosette disease in groundnuts or blight

v) Heat treatment for the control of ratoon stunting disease in sugarcane.

vi) Proper drying of cereals and pulses before storage to control Aflatoxin

vii) Planting disease resistant varieties eg Ruiru 11, for the crop to be able to resist attack by coffee Berry disease.

viii) PCrop rotation – starves the disease causing organisms to death

ix) Proper crop nutrition – makes the crop strong and able to resist attack by disease

x) Close season – This is the period when a susceptible crop is not grown in order to control a certain disease.

xi) Timely planting/ early planting – enables the crop to escape attack by the disease eg blight in tomatoes and irish potatoes.

xii) Prunning/ open pruning / staking/ altering of environmental conditions / irrigation; irrigation during dry season controls blossom end in tomatoes, staking and pruning reduce

blight in tomatoes   (Stating ½ mk explaining ½ mk x 8 = 8mks)

b)   **Problems of marketing agricultural produce**
- i)   Interferance by the state; such as hoarding causing artificial shortage leading to price fluctuation (higher prices.)
- ii)   Poor training of people involved in marketing; leading to heavy losses to the farmer
- iii)   Bulkiness of most Agricultural produce; making transportation/ storage difficult and expensive
- iv)   High perishability of produce; leading to low quality within a short time
- v)   Seasonality of produce; leading to price fluctuation
- vi)   Inadequate storage facilities; leading to heavy losses of produce
- vii)   Poor infrastructure; leading to high transport costs and spoilage of agricultural produce
- viii)   Change in market demand; due to time lag between production and marketing
- ix)   Change of supply of Agricultural produce; leading to fluctuation of market prices.
- x)   Inadequate market information to farmers; leading to selling of farm produce hen the prices are low
- xi)   Lack of capital to finance various marketing functions eg advertising and transportation
- xii)   Competition with synthetic/cheap products leading to loss of market.
  (stating ½ mk explaining ½ mk x 8 = 8mks)

c)   **Ways in which grass cover conserve soil & water**
- i)   Grass filters / traps soil from the run off
- ii)   Grass roots holds/ binds the soil together
- iii)   Grass cover reduces evaporation of soil moisture (reduce loss of soil moisture)
- iv)   Grass reduce speed of runoff hence reducing erosive power of runoff
- v)   Grass slows down runoff hence encourage water infiltration and deposition of soil upstream
- vi)   Grass leaves/ foliage on decomposition improves soil fertility and soil structure
  (1 x any 4 = 4mks)

27.   **a)**   **Ways of dealing with risks and uncertainties**
- i)   Diversification/ growing a variety of crops/ having various enterprises; so that if one fails the farmer has something to rely on (avoid total loss)
- ii)   Insurance against losses/ taking insurance policy for farming activities; so that in case of failure the enterprises are covered (compensated)
- iii)   Inventory marketing/ strategic farming; keeping farm products and selling them at a time when prices are favourable (high)
- iv)   Flexible enterprises; engaging in enterprises that can be stopped or started early as conditions change or stopped and changed.
- v)   Rationing of inputs; using just sufficient inputs such that in case of losses the costs are not too high.
- vi)   Contract marketing/ Hedging; making arrangement with marketing agencies in advance so that changes in prices after arrangement do not change the price of the farmers produce.
- vii)   Using more certain husbandry practices/ using practices that the farmer is sure of and has used in the past ; This increase chances of success.
- viii)   Selecting more certain enterprises/ selection of enterprises that have done well in the area / tried through research; increase the chance of success.
- ix)   Maintain liquidity; for use incase of any eventuality
- x)   Adopting modern production techniques

b)   **Factors influencing spacing of crops**
- i)   Growth habit of the crop/nature of plant growth; crops that tiller, spread, creep, tall may require a wider spacing than those that do not.
- ii)   Intended use/ purpose of the crop; maize for silage is planted at a closer spacing than that for grain production.
- iii)   Type of machinery to use for field maintenance operation

- Spacing adopted should allow passage for various operations such as weed control, spraying and harvesting
iv)   Soil fertility; A fertile soil allows closer spacing compared to poor soils
v)   Moisture content of the soil/amount of rainfall in the area;
      High moisture content/rainfall may allow closer spacing but low rainfall may necessitate wider spacing.
vi)   Interplanted crops; crops planted with others in rows will require wider spacing
vii) Pest control; properly spaced crops will make it difficult for pests to move from one plant to another e.g aphids.
viii) Disease control; Rosette virus in groundnuts is controlled by close spacing / wider spacing controls fungal disease eg blight
ix)   Number of plants/seeds per hole; where more than one seed (plant) per hole wider spacing is required.
      1 for stating   6 x 1 = 6mks
      1 for explanation   6 x 1 = 6mks
                      Total   = 12mks

MARAKWET WEST DISTRICT
443/2
AGRICULTURE
Paper 2
July/August - 2015
MARKING SCHEME

1. **Four precautions observed when working with livestock tools**
   - Tools kept in safe place after use
   - Tools used for the correct job
   - Maintained and serviced always
   - Handle correctly when in use
   - Use safety devices / first Aid   (½ x 4 = 2mks)

2. **Other good qualities of Jersey breed over fresian**
   - Hardy/ withstand high temperatures
   - Needs less food
   - Excellent grazer on fairly poor pasture   (½ x 2 = 1)

3. **Factors that influence rate of respiration**
   - Body size
   - Amount of exercise
   - Degree of excitement
   - Ambient temperatures   (½ x 4 = 2mks)

4. - Browse on a wide variety of bitter leaves
   - Do not graze from the ground where they can pick eggs of parasites   (½ x 2 = 1mk)

5. - To resist diseases
   - To enhance production of quality produce
   - To facilitate faster growth   (½ x 4 = 2mks)

6. Crutching is the cutting of wool around the vulva of the sheep while ringing is the trimming around the penis sheath of rams   (mark as a whole 2mks)

7. - Mother dies
   - Mother rejects the kid
   - Mother is a dairy goat
   - Mother does not have enough milk/does not produce milk (@ ½ x 3 = 1 ½ mk)

8. - Prevent moisture rising up the wall
   - Prevent coldness from ascending
   - Prevent termites from rising up the wall   (@ ½ x 2 = 1mk)

9. - Absence of vigor mortis / No stiffness of joints
   - Dark watery blood oozing from natural openings
   - Excessively blown stomach
   - Blood does not clot   (@ ½ x 2 = 1mk)

10. - The reputation of the supplier
    - Time factor from the hatchery to the farm
    - Type of chick available or required   (@ ½ x 2 = 1mk)

11. - Restrain cow in a crush
    - Assemble milking equipment
    - Provide dairy meal feed
    - Wash udder with warm water/ dry towel
    - Test presence of mastitis using a strip cup   (½ x 4 = 2mks)

12. - Power take off shaft
    - Draw bar
    - Hydraulic system   (@ ½ x 3 = 1 ½ mks)

13.   - Progesterone
       - Prolactin
       - oxytocin   (½ x 3 = 1 ½ mks)

14.   - Levelling the seedbed
       - Breaking large soil clods
       - Mix soil with organic matter
       - Cover broadcasted seeds
       - Uproot weeds
       - Aerate the soil   (@ ½ x 2 = 1mk)
15.   - Increase efficiency of machines/ reduce wear and tear caused by friction
       - Reduce heat created by rubbing surfaces
       - Acts as a cleaning agent of dust
       - Prevent rusting of stationary machines   (@ ½ x 4 = 2mks)
16.   - Fertilize the queen during nuptial flight
       - Keep the hive cool by flapping their wide wings at high speed
                       (@ ½ x 2 = 1mk)
17.   - Malpresentation of the the foetus
       - Retained afterbirth
       - Prolonged labour pains   ((@ ½ x 2 = 1mk)
18.   - Overgrown hooves
       - Presence of sharp objects eg stones
       - Muddy living/ grazing areas
       - Tick infestation between hooves
                       (@ ½ x 4 = 2mks)
19.   Strategic treatment – It involves giving animals drugs regularly each year with purpose of
       reducing risk of infection or contamination of internal parasites eg worms
       Tactical treatment- involves giving animals drugs during the year to avoid outbreak of internal
       parasites when climatic and nutritional conditions become abnormal   (2mks)
20.   a)   M – Piston
               N – Crankshaft
               P – Differential axle   (@ ½ x 3 = 1 ½ mks)
       b)   - Transmits/ breaks power from the engine to the selected gear
               - Stops the tractor while the engine is running for gradual acceleration from rest position
               - For gradual engagement of power to the rear wheels.   (@ 1 x 3 = 3mks)
21.   a)   A – Oviduct
               X – Uterus / shell gland
               Y – Magnum   (@ ½ x 3 = 1 ½ mks)
       b)   - Water
               - Vitamins
               - Mineral salts   (@ ½ x 2 = 1mk)
       c)   18 – 22hours (½ mk)
       d)   Part Q   (½ mk)
22.   a)   X – wood chisel   (½ mk)
               Y – cold chisel   (½ mk)
       b)   D – Cutting edge
               E – Bevel edge blade
               F – Shoulder
               G – Header   (@ ½ x 4 = 2mks)
       c)   Oilstone   (½ mk)
23.   a)   B – Landside

                D – U-bolt

                F – Draft rod   (@ ½ x 3 = 1 ½ mks)

b)   A – invert furrow slice

              C – Cut furrow slice horizontally

              E – Adjust the depth of ploughing   (@ ½ x 3 = 1 ½ mks)

c)   - Cheap to buy

              - Few skilled labour is required to use

              - Plough on any land topography

              - Economical to small scale farmers   (@ ½ x 4 = 2mks)

24.   a)   Ear notching   (½ mk)

     b)   - Facilitate culling

              - Ease in record keeping

              - Ease feeding

              - Facilitate disease control

              - Facilitate selection and breeding   (@ 1 x 2 = 2mks)

SECTION C (40 MARKS)

25.   a)   - Forage conservation as silage or hay used during time of scarcity

              - Paddocking to achieve rotational grazing to conserve and maximize use of pasture without wastage.

              - Irrigation of pasture

              - Increase yield during drought

              - Selective destocking – to reduce number of animals during drought

              - Construction of dams and boreholes to supply constant water

              -Provision of supplements to supply deficient nutrients or elements

              - Growing of drought resistant pasture species to maintain continous supply of pasture

              - Reseeding pastures is done at beginning of rains to ensure maximum yields.

                    (stating ½ x 5 = 2 ½ mks)

                    Explanation ½ x 5 = 2 ½ mks)

                        Total = 5mks

     b)   - High stocking rate

              - Easy to keep egg production records

              - High laying percentage

              - No vices eg egg eating and cannibalism

              - Clean egg production

              - Broodiness is minimized

              - Control disease spread

              - Less labour under automated feeders and waterers

              - Manure accumulates easily   (@ 1 x 5 = 5mks)

     c)   - Proper disposal of placenta/ afterbirth

              - Cut umbilical cord with sterilized scapel

              - Removal of needle teeth/ tooth clipping

              - Keep piglets in warm/ creep area

              - Weigh piglets regularly/ 24 hours after birth

              - Feed piglets on colustrum

              - Provide iron supplementation – intramuscular injection

              - Vaccination against diseases

              - Creep feeding

              - Identification

              - Deworming/drenching to control internal parasites / worms

              - Tail cutting

        - Castration of male piglets   (1 x 10 = 10mks)

26.   a)   - Causal organism – virus; Enterovirus; A, C & D   (1mk)
- Infected saliva
- Contaminated litter, machinery
- Feeds
- Vaccines   (any point 1mk)
- Profuse salivation
- Wounds/ Blisters in mouth, muzzle and between hooves
- Emaciation
- High fever/ rise in temperature
- Reduction in milk production   (4 x 1 = 4mks)

   b)   Longer lifespan i.e economic life
- Maximum production in terms of quantity or more draught power
- Quality products which fetch high market price
- High fertility – reproduce faster
- Economical to keep and many offsprings
- Do not spread diseases
        Factor – 1 x 5 = 5mks
        Explanation 1 x 5 = 5mks
          Total = 10mks

   c)   - Vaccination every 6 months
- Imposition of quarantine
- Slaughter affected animals
- Isolation of farm animals from wild life
- Strict hygiene   (1 x 4 = 4mks)

27.   a)   Site selection
- Suitable topography/ gentle sloping
- Availability of water
- Correct soil type

   ii)   - Clear the land
- Clear all the vegetation around the place

   iii)   Mark the site
- Put pegs
- Mark exit and inlet channels

   iv)   Digging the pond
- Dig and separate topsoil and subsoil
- Upper side 0.5M deep and lower side 1.7m deep
- Use concrete on floor to prevent seepage

   v)   Construction of dykes
- Compact wall around pond for reinforcement
        Step – 1 x 5 = 5mks
        Description 1 x 5 = 5mks
        Total 10mks

   b)   - Eggs on underground hatch into larva.
- Larva climb 1st host suck blood, engorge drop to the ground
- On the ground larva moult into nymph and climb 2 host suck blood engorge and drop
- On the ground nymph mount into adult climb 3rd host suck engorge male and drop on the ground adult lay egg and cycle continues. (1 x 7 = 7 mks)

(c)   **Factors that affect digestability of food**
- Chemical composition of food
- Ratio of energy to protein

- Species of animal
- Food already in the digestive system
- Form in which food given to animal
- Fibre composition of the seed   (1 x 3 = 3mks)