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SUBJECT: AGRICULTURAL SCIENCES

GRADE 12

AUTUMN CLASSSES

TEACHER AND LEARNER CONTENT MANUAL

Topics

ANIMAL PROTECTION & CONTROL

1. Animal Health
2. Animal Diseases
3. Parasites-Endo & Exoparasites
4. Plant & Salt, Urea poisoning

AGRICULTURAL SCIENCES PROGRAMME FOR 2024 AUTUMN CLASSES

	TOPICS	DURATION
DAY 1	PRE-TEST (Peer-marking & Feedback)	60 min
	Topic Terminology - Discussions	55 min
	Homework	5 min
DAY 2	Homework (Peer-marking & Feedback)	20 min
	Animal Heath	30 min
	Activity 1	20 min
	Animal diseases	30 min
	Activity 2	20 min
DAY 3	Homework (Peer-marking & Feedback)	20 min
	Internal parasites	30 min
	Activity 3	20 min
	External parasites	30 min
	Activity 4	20 min
DAY 4	Homework (Peer-marking & Feedback)	20 min
	Plant poisoning & Salt poisoning	30 min
	Activity 5	20 min
	Principles & Role of State	30 min
	Activity 6	20 min
Day 5	POST TEST (Peer-marking & Feedback)	60 min
	More Activities/ Mind-map	60 min

AGRICULTURAL SCIENCES PROGRAMME FOR 2024 AUTUMN CLASSES

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TOPIC 4: External parasites o Examination guideline and Outcomes o Economic implications , Prevention and Control o Brief notes and Worked examples. o Activities	**21 – 30**
TOPIC 5: Plant and Salt poisoning o Examination guideline and Outcomes o Treatment, Prevention/Control o Brief notes o Activities	**31 –35**
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ICON DESCRIPTION

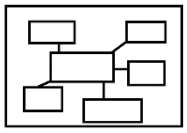
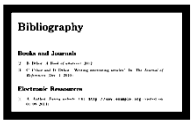
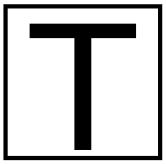
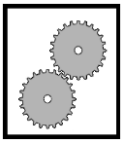
 MIND MAP	 EXAMINATION GUIDELINE	 CONTENTS	 ACTIVITIES
 BIBLIOGRAPHY	 TERMINOLOGY	 WORKED EXAMPLES	 STEPS

TABLE 1: AGRICULTURAL SCIENCES TERMINOLOGY.

IMPORTANT TERMS AND DEFINITIONS	
1. A device that measures body temperature	**Thermometer**
2. An abnormally high body temperature	**Fever**
3. Having a loose, watery stool during bowel movement	**Diarrhea**
4. Number of heartbeats in one minute	**Pulse rate**
5. Number of breaths in one minute	**Respiratory rate**
6. When one cuts open the carcass of dead animal to determine the cause of death	**Post-moterm**
7. When you examine animals for signs of disease	**Clinical examination**
8. The identification of a disease from the examination of symptoms.	**Diagnosis**
9. Disease that must by law be reported to authorities	**Notifiable/proclaimed**
10.Rapid spread of a disease more than it can be controlled	**Outbreak**
11.A disease outbreak that is consistently present and predictable in a particular area.	**Endemic diseases**
12.When a disease is prevalent or constantly present in a population and affects animals.	**Enzootic diseases**
13.Diseases that can be transmitted from animals to humans and from humans to animals	**Zoonotic diseases**
14.When a disease affects a large number of animals in a region or country.	**Epidemic**
15.When a disease has spread to other countries	**Pandemic**
16.Disease causing organisms such as virus, bacteria etc	**Pathogens**
17.Disease carrying organisms from infected to healthy animals	**Vectors / Carriers**
18.Very small single-celled microscopic organisms	**Bacteria and Protozoa**
19.Plant like organism that cause diseases to animals	**Fungi**
20.Device used to put a pill in an animal's mouth or throat	**Dosing gun**
21.Diseases that can be transmitted from one animal to another	**Infectious diseases**
22.Diseases that cannot be transmitted to other animals	**Non-infectious diseas**
23.Diseases caused by nutrient/mineral deficiencies in the body	**Metabolic diseases**
24.An organism that lives in 0R on an organism of another species for its food.	**Parasites**
25.Are parasites that attack the body surface of animal	**External parasites**
26.Protein substances produced by white blood cells in response to specific foreign antigens	**Antibodies**
27.Chemical compounds used to kill bacterial and fungal infections	**Antibiotics**
28.Keeping animals in isolation for a fixed period of time	**Quarantine**
29.An ability to infect other animals	**Contagious**

TOPIC 1: ANIMAL HEALTH

ANIMAL HEALTH: EXAMINATION GUIDELINES

Animal health

- Describe the signs of poor health/sick animals (cattle, pigs, and chickens)
- Name and describe the methods of testing animal health.
- Various methods of administering medicine to animals (cattle, sheep, pigs, and chickens)
- Describe the sustainable use of medication.
- Distinguish between infectious, non-infectious, and metabolic animal diseases.
- Identify and distinguish between the levels of seriousness of animal diseases (chronic, per-acute, and acute)

Signs of poor health in animals

1. Fever
2. Dull eyes
3. Dull coat.
4. Poor appetite
5. Rapid pulse rate
6. Lameness
7. Listlessness
8. Laboured breathing
9. Diarrhoea

Methods of testing animal health

1. Check Temperature
2. Check Pulse rate
3. Check Respiratory rate

Methods of administering medicine to animals

1. Oral administration/Dosing (through the mouth)

✓ Dosing gun (pills, powders)

✓ Drenching gun (liquids)

2.Topical administration (placed in the skin)

✓ Ointments, creams, lotion, powders

3. Injection

✓ intravenously (into veins)

✓ Intramuscular (into a muscles)

✓ Subcutaneously (under skin)

✓ Intradermal (between layers of the skin)

4. Dipping

5. Spraying

Sustainable use of medicine

1. Don't medicate too often
2. Finish full treatment
3. Correct dosage
4. Safe use and check expiry

Levels of seriousness

1. **In per-acute** – animals may drop dead(sudden death) within a few hours without showing signs e.g. Anthrax
2. **Acute** – symptoms develop rapidly but last for a short time (few days) e.g. FMD, RVF, Avian flu
3. **Chronic** - symptoms develops slowly over longer time(weeks to months), but fatal if it remains untreated.
   Chronic diseases tend to be more severe as they progress.
   Chronic conditions are often associated with non-communicable diseases/ not notifiable. E.g. Mastitis

Infectious and non-infectious diseases

Infectious diseases – is transmittable from one animal to another.

(They are spread through the air, by direct contact, by contaminated dead carcasses or objects , by oral ingestion and transmitted by insects.

Zoonotic animal diseases include anthrax, rabies, ringworm and tuberculosis.)

Non-infectious diseases – cannot be transmitted to another animal.(Non-contagious).

Metabolic diseases are caused by disorders that disturb metabolic processes in the animal's body.e.g mineral deficiencies.

TOPIC 2: ANIMAL DISEASES

Animal diseases

- Indicate the main micro-organisms causing diseases in animals
- Identify the most important diseases in South Africa based on the mode of transmission, animal host, symptoms and control measures

Viral and bacterial diseases

- Evaluate viral diseases, like foot and mouth disease (FMD), rabies, Rift Valley fever (RVF), avian/bird flu, swine fever/flu and Newcastle disease (NCD)
- Explain bacterial diseases prescribed, such as anthrax, mastitis and tuberculosis (TB): transmission, host,symptoms and control measures

Protozoal and fungal diseases

- Indicate protozoal diseases, like anaplasmosis, redwater, heartwater and coccidiosis
- Describe fungal diseases, like lumpy wool and ringworm
- Identify and explain the economic implications of these animal diseases
- Describe the preventative/control measures for animal diseases

The main micro-organisms causing animal diseases (PATHOGENS)

1. **Virus** - R, R, F, A ,N, S- (**R**abies, **R**ift Valley Fever, **F**oot and mouth disease, **A**vian/bird flu, **N**ewcastle disease, **S**wine flu)
2. **Bacteria** - A, T, M - (**A**nthrax, **T**uberculosis, **M**astitis)
3. **Protozoa** – 2 waters, 2 sis - (Red**water**, Heart**water**, Anaplasmo**sis**, Coccidio**sis**)
4. **Fungi** - L,R - (**L**umpy wool, **R**ingworm)

R

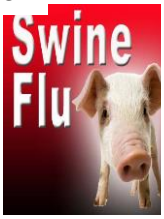
R

F

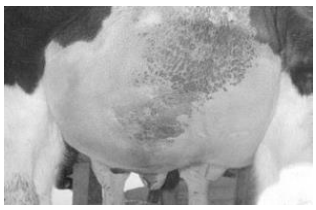
A

N

S



DISEASES **(VIRAL)**	TRANSMISSION MODE	ANIMALS AFFECTED	MAIN SYMPTOMS	CONTROL MEASURES
RABIES	Saliva through bite	Cattle, goat Sheep etc.	• Aggression • Excessive salivation	Vaccination, kill and dispose
RIFT VALLEY FEVER	Mosquito bites	Cattle, goat Sheep etc.	• Blood-stained nasal discharge, Abortion	Vaccination, kill and dispose
FOOT AND MOUTH DISEASE	Contaminated feed Secretions	Cattle, goat Sheep etc.	• Blisters in mouth • Sticky foamy salivation	Vaccination, Cull infected animals, Quarantine
AVIAN/BIRD FLU	Direct contact, inhalation,secretions	Chickens, birds	• Swelling of comb • Ruffled feathers	Vaccination, kill and dispose
NEWCASTLE DISEASE	Direct contact, inhalation,secretions	Chickens, birds	• Respiratory distress • Twisted necks	Vaccination, kill and dispose
SWINE FLU	Direct contact, inhalation,	Pigs	• Vomiting • bleeding from the	Vaccination, kill and dispose



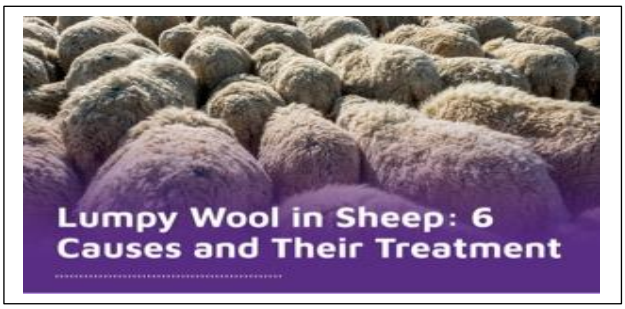
BACTERIAL DISEASES

DISEASES **(BACTERIAL)**	TRANSMISSION MODE	ANIMALS AFFECTED	MAIN SYMPTOMS	CONTROL MEASURES
ANTHRAX	Spores, biting flies, Contaminated feed	Cattle, goat Sheep etc.	✚ Bloody discharge from nose, mouth, rectum ✚ Swelling of neck and throat	Vaccination, kill and dispose (bury or burn carcass)
TUBERTUTOSIS (TB)	Inhalation, secretions	Cattle, goat Sheep etc.	✚ Soft, chronic coughs ✚ Increased breathing rate	Vaccination, kill and dispose
MASTITIS	transferred by the hands of the milker, by milking machines and by flies,	Dairy Cattle, goat Sheep etc.	✚ Udder is hot, swollen and painful ✚ Milk is thick flaky & may contain clots	Treat teats with germicide Apply antibiotics. Clean and sanitise

PROTOZOAL DISEASES

DISEASES **(PROTOZOAL)**	TRANSMISSION MODE	ANIMALS AFFECTED	MAIN SYMPTOMS	CONTROL MEASURES
REDWATER	One-host blue tick -BLUE TICK	Cattle only	▪ Urine is dark red or brown	Inject with Berenil Control ticks. Dip and vaccinate
HEARTWATER	three- host ticks - BONT TICK	Cattle, goat Sheep etc.	▪ Respiratory distress ▪ Unco-ordinated . Movements (high" stepping)	Inject with tetracycline Control ticks. Dip and vaccinate
ANAPLASMOSIS	Ticks and biting flies	Cattle, goat Sheep etc.	▪ Anaemia -Yellow and pale mucous membrane	Broadspectrum antibiotics. Control ticks, Dip and vaccinate
COCCIDIOSIS	Ticks and biting flies	Cattle, goat Sheep, poultry etc.	▪ diarrhoea containing blood	**Administer** anticoccidial drugs Sanitation

FUNGAL DISEASES



DISEASES **(FUNGAL)**	TRANSMISSION MODE	ANIMALS AFFECTED	MAIN SYMPTOMS	CONTROL MEASURES
LUMPY WOOL	Direct contact shearing equipment	Sheep ,goats	Lumps and scabs on the fleece	Jet and **dip with zinc sulphate**. Treat with **antibiotics Biological defieecing**
RINGWORM	Direct contact	Cattle, goat Sheep, pigs etc.	Hair loss **circular bare patch** Area of **small crusts and scales on the skin**	apply a **mixture of iodine and glycer**ine PLUNGE DIP

ECONOMIC IMPLICATIONS OF ANIMAL DISEASES

FOR COUNTRY	FOR FARMER	FOR WORKERS	FOR BUYERS
Loss of production	Loss of production		Shortage of products
Loss of income/GDP	Loss of income/Profit	Price increases	Price increases
Loss of international trade (Export and import bans)			
Cost of producing / buying a vaccine	Vaccination costs		
Cost of quarantine			
Veterinary services costs	Veterinary services costs		
Cost of Research			
Unemployment increases		Loss of jobs	
Publication costs/ making public aware			

PREVENTION MEASURES OF ANIMAL DISEASES	CONTROL MEASURES OF ANIMAL DISEASES
Vaccination /Immunisation	Treat bacterial and protozoal with **antibiotics**
Sanitation and good hygiene	Cull infected animals and burn or bury bodies
Quarantine and test imports	Quarantine infected animals

ACTIVITY 1 **(20 Marks; 20 Minutes)**

1.1 Define the term:

1.1.1 Notifiable diseases (2)

1.1.2 Respiratory rate (2)

1.1.3 Zoonotic (2)

1.1.4 Enzootic (2)

1.1.5 Endemic (2)

1.2 Various options are provided as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question numbers (1.1 to 1.5) in the ANSWER BOOK, e.g. 1.6 E.

1.2.1 Before giving any treatment, the following precautions must be taken.

A Check the date of manufacturing the medicine

B The number of animals

C Correct treatment, dosage and period

D Medicine doesn't taste well (2)

1.2.2 Preventing diseases by vaccination involves...

A medicating against parasites

B monitorling the disease

C giving animals more water to drink

D providing a weakened pathogen to stimulate the body to build antibodies. (2)

1.2.3 Which ONE of the following viral disease is mainly transmitted by inhalation or is airborne.

A. Rabies

B. Anthrax

C. Rift valley fever

D. Swine flu. (2)

1.2.4 An example of an enzootic diseases include the following:

A Rabies

B Anthrax

C Newcastle disease

D Tubertulosis (TB) (2)

1.2.5 Consider the zoonotic diseases below that are notifiable.

(i) Anthrax
(ii) Avian flu
(iii) Foot and mouth disease
(iv) Newcastle disease

CHOOSE THE CORRECT COMBINATION

A (i), (ii) and (iii)

B (ii), (iii) and (iv)

C (i), (ii) and (iv)

D (ii), (iii) and (iv) (2)

1.2.6 Which of the statements below is most correct about Rift valley fever.

A Outbreaks of RVF in humans precede animal cases

B To control the spread of RVF involve protection against fly bites

C Outbreaks of RVF in animals precede human cases

D The is no risk of animal-to-human transmission. (2)

(22 marks)

ACTIVITY 2 **(20 Marks; 25 Minutes)**

2.1 The normal heartbeat and respiratory rates for pigs vary depending on the age of the pig. Below is a list of the rates for various ages:

PIG AGE	NORMAL RESPIRATORY RATE (bpm) - BREATHS PER MINUTE)	NORMAL PULSE RATE (HEART BEATS PER MINUTE) (bpm)
Newborn	60	250
Weaned pig	40	100
Growing pig	40	90
Finishing pig	35	80
Adult pigs	18	80

2.1.1 Draw a line graph to indicate the normal pulse rate and respiratory rate for pigs at various ages. (6)

2.1.2 Suggest the respiratory and the pulse rate of a sick adult pig respectively. (2)

2.2 The table below represents the vaccination plan that a farmer uses to prevent acute animal diseases on a farm.

DISEASE	PATHOGEN INVOLVED	MAJOR SYMPTOM OF THE DISEASE	FARM ANIMALS IMMUNISED	CONTROL MEASURE
A	Bacteria	Swelling of neck, causing respiratory distress and bloody discharge from the nose, mouth and rectum	**B**	Vaccinate, kill infected animals and dispose of their carcass
C	**D**	Dark red urine	**E**	**F**
Foot-and-mouth disease	Virus	**G**	Cattle, sheep and goats	**H**
Rift Valley fever	**I**	High fever, blood- stained nasal discharge and abortions	Cattle, sheep and goats	**J**

2.2.1 Complete the table above. Write only the answer next to the letter (A–J) in the ANSWER BOOK. (10)

*2.*2.2 Name the vectors for (a) redwater *and(b) rift* valley fever. (2)

2.2.3 Indicate the mode of transmission of Disease A to humans (2)
(20 marks)

ACTIVITY 3. **(20 Marks; 25 Minutes)**

3.1 The Department of Agriculture reported several foot-and-mouth disease (FMD) outbreaks in different areas of South Africa. This led to a ban on the export of animals and their products. Veterinarians were then deployed to the affected areas and infected animals were separated from non-infected animals.

3.1.1 Indicate the pathogen that causes the disease in the scenario above. (1)

3.1.2 Give TWO main symptoms of foot-and-mouth disease in farm animals. (2)

3.1.3 Deduce how foot and mouth disease could cause mastitis in dairy cows. (1)

3.1.4 Identify, in the scenario above, TWO roles of the state regarding animal disease control. (2)

3.1.5 Suggest ONE word (term) for the last statement in the scenario above. (1)

3.1.6 Indicate the mode of transmission of foot and mouth disease (FMD) to animals and humans. (2)

3.1.7 State TWO economic impacts of foot-and-mouth disease on South. Africa. (2)

3.2 Swine flu, anthrax, foot-and-mouth disease, tuberculosis and rabies are all highly contagious and pandemic diseases. Some are zoonotic while others are enzootic. Most of these diseases are notifiable diseases. The diseases are caused by different pathogens which could be transmitted by either direct contact or inhaling infected air. Some can remain infectious for weeks or even many months. People can also be infected by eating animal products from affected animals.

3.2.1 Classify the **first two** diseases in the scenario above according to the pathogens that cause them. (2)

3.2.2 Explain the meaning of *zoonotic diseases*. (2)

3.2.3 Differentiate between endemic and enzootic diseases (4)

3.2.3 Identify TWO diseases in the scenario that could be transmitted by BOTH the direct contact and inhaling infected air. (2)

3.2.3 Explain why swine flu is regarded as enzootic? (1)

3.2.4 Give TWO roles of the state in controlling the spread of notifiable diseases such as anthrax, swine flu to other countries. (2)

3.2.3 State TWO economic impacts of animal diseases regarding giving treatment and medication to sick animals. (2)

(26 marks)

ACTIVITY 4. **(20 Marks; 25 Minutes)**

4.1 The table below shows symptoms of different diseases in farm animals.

	ANIMAL 1	ANIMAL 2	ANIMAL 3	ANIMAL 4
MAIN SYMPTOMS	Blood-stained nasal discharge and abortion or death of young	Bloody discharge from the mouth, nose, and rectum	Skin surface and fleece contains scabs or a crust	Urine is dark red or brown

4.1.1 Identify the diseases affecting animals **1**, **2, 3 and 4 r**espectively. (4)

4.1.2 Identify the animal suffering from a deadly bacterial disease. (1)

4.1.3 Name a pathogen that causes the disease in animal **3**. (1)

4.1.4 Classify the vector for the disease in animal **4.** (1)

4.1.5 State THREE precautionary measure a farmer can take to prevent the spread of the disease in animal **3**. (3)

4.1.6 Compare the diseases that affect animals **1 and 2** in terms of: (PLEASE TABULATE)

a. Pathogen that causes the disease (2)

b. Level of seriousness (2)

c. Mode of transmission (2)

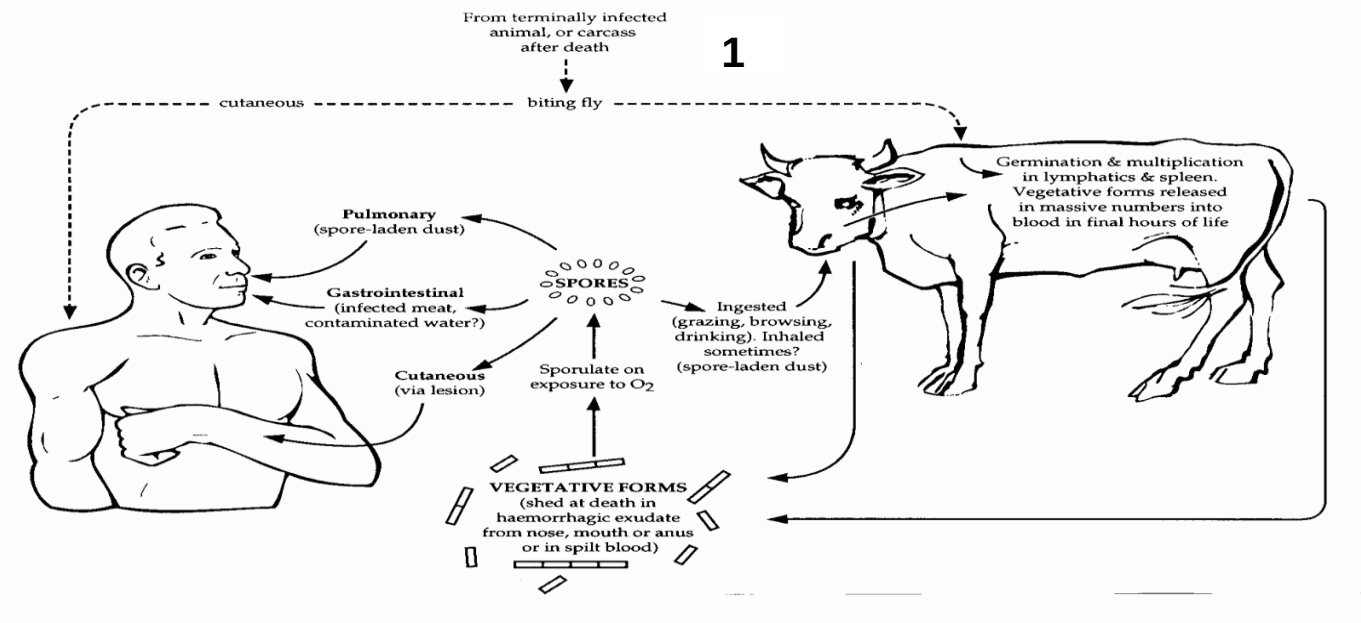
d. Animal hosts. (2)

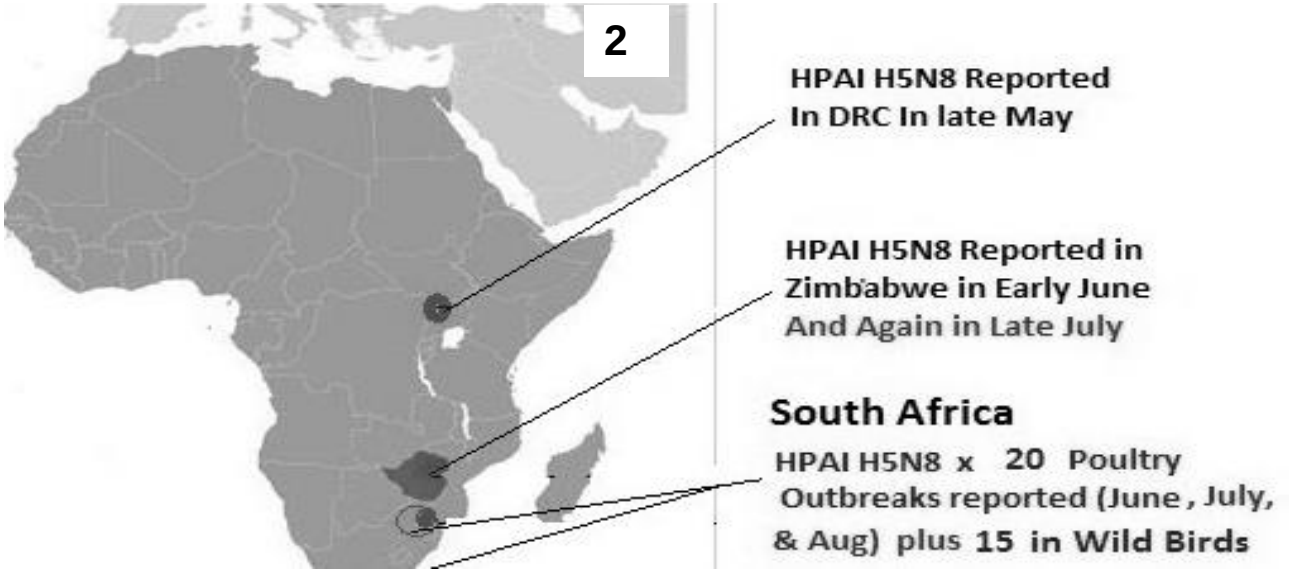
e. Control measure. (2)

TOTAL MARKS :**(20)**

ACTIVITY 5 **(20 Marks; 25 Minutes)**

5.1. STUDY THE PICTURES BELOW AND ANSWER THE FOLLOWING QUESTIONS:





5.1.1. Deduce the disease in pictures 1 and 2 respectively. (2)

5.1.2 Identify the animal host for disease in picture 2. (1)

5.1.3. Identify a term in picture 2 that means that the disease spread very fast. (1)

5.1.4. The disease in picture 1 spreads by means of spores, indicate any TWO ways in which these spores could be transmitted to humans. (2)

5.1.5. The disease in picture 2 is **pandemic** in Africa. Substantiate (2)

5.1.6. Suggest the economic implications of the disease in picture 2 for the South African consumers. (2)
(10)

ACTIVITY 6. **(33 Marks; 35 Minutes)**

6.1 The pig in the picture below appears to be very sick. Study the picture to answer the questions that follow.

6.1.1. List any THRE signs of poor health visible in the pig picture above. (3)

6.1.2. Taking temperature, pulse **rate**, and respiration readings can help you to gauge an animal's overall health. Name the device used to check temperature. (1)

6.1.3. Comment on the temperature and the respiratory rate of the pig in the above picture. (2)

6.1.4. Give a short description of how you would go about checking the temperature and the pulse rate of the pig. (4)

6.1.5 The pig above may be suffering from a pathogenic disease or from a metabolic disease. Differentiate between these two types of diseases. (4)

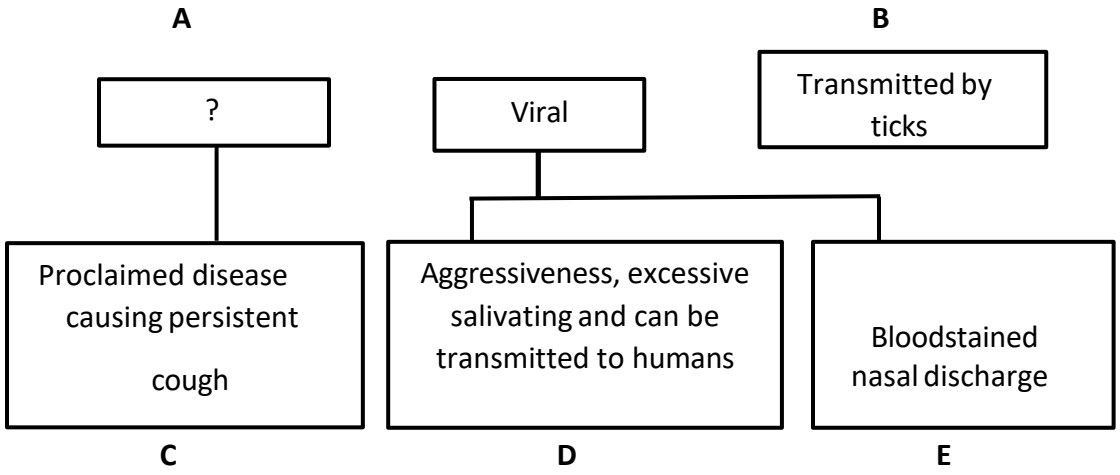
6.1.6. Give TWO examples of each disease type in Question 6.1.5. (4).

6.1.7. Indicate TWO ways to ensure that pig medication is sustainable. (2)

(20 marks)

ACTIVITY 7 **(33 Marks; 35 Minutes)**

The flow chart below shows the different farm animal diseases.



7.1.1 Identify the pathogen responsible for diseases **A** and **B**. (2)

7.1.2 Indicate the transmission mode of the virus for disease **D**. (1)

7.1.3 Name the vector that carries viral disease **E** during hot, wet seasons. (1)

7.1.4 Advise the farmer on a preventative measure for the occurrence of disease **E**. (1)

7.1.5 Suggest TWO measures the state can take to control the spread of disease **C**, once detected. (2)

TOPIC 3: PARASITES

PARASITES: EXAMINATION GUIDELINES

Internal parasites/Endoparasites

- **Define the term internal parasite**
- **Identify and describe the main groups of internal parasites, like tapeworms, liver fluke and roundworms**
- **Describe the life cycles, animal hosts, symptoms and treatment of tapeworms, liver fluke and roundworms.**
- **Explain the financial implications and detrimental effects of internal parasites**
- **Describe the basic preventative/control measures of internal parasites**

External parasites/Ectoparasites

- **Define the term external parasite**
- **Distinguish between ticks, nasal worm, blowflies, lice and mites as examples of external parasites**
- **Identify and describe the life cycles of ticks (single/two/three host ticks), nasal worm (sheep) and blowflies, lice and mites (sheep). ????**
- **Explain the financial implications and detrimental effects of external parasites**
- **Describe the basic preventative/control measures of external parasites**

IMPORTANT TERMS AND DEFINITIONS

Animal Pests	Organisms that live on or outside the host organism and share the same environment with the host
External parasites	are parasites that attack the body tissues such as blood, skin and hair of animal.
Internal Parasites	are parasites that live inside the host and rob it of its food and blood .
Biological control	is defined as 'any activity of one species that reduces the adverse effect of another

CLASSIFICATION OF PARASITES OF LIVESTOCK

There are two main types of parasites affecting livestock. These are:

1 External /Ecto-Parasites
2 Internal /Endo-Parasite

Internal Parasite.

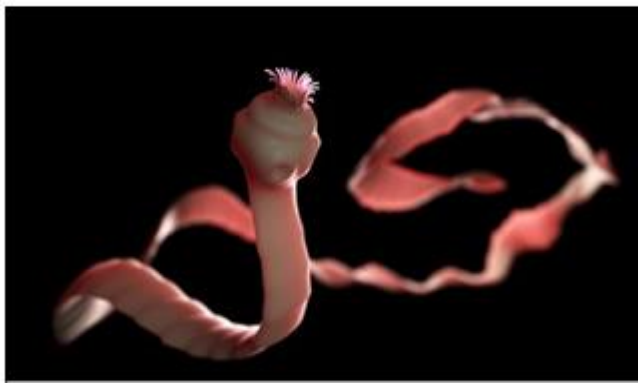
It is an organism that lives inside a host organism and derives it nutrient form the host

Main groups of internal parasites.

1 Tapeworms/cestodes
2 Liver fluke/Fasciola
3 Roundworms/

Tape Worm

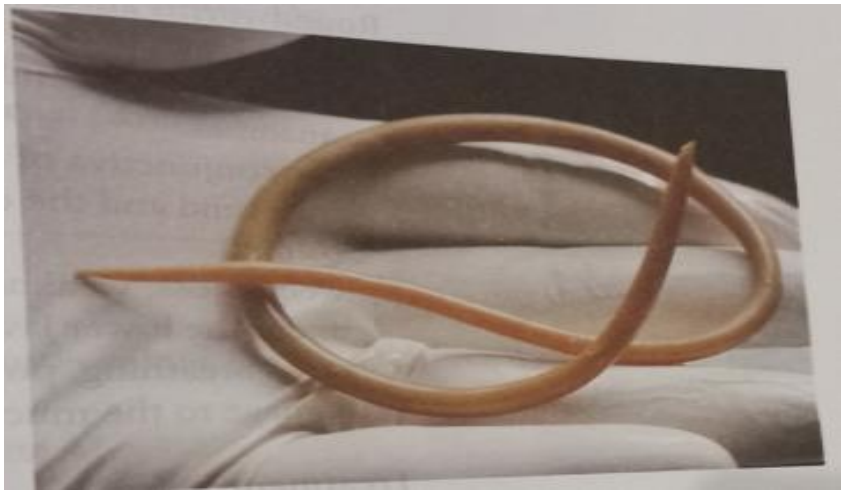
Description :This is a long, narrow, and flat organism that lives in intestines of hosts organisms.



Liver fluke/Fasciola hepatica

Description: These are flat leaf-like flukes that live in the bile ducts in the host organism.

Roundworms/threadworm/Ascaris



These are small, white thread-like and live in the gut/alimentary canal and lungs of hosts.

Name of parasite	Life cycle	Animal hosts	symptoms	treatment
Tape worm	Eggs ↓ Larvae ↓ Nymphs ↓ Adults	Cattle, sheep and goats	Potbelly Stunted growth and reduced weight diarrhea	Dose animals with anthelhelmintics (dewormers
Liverfluke	Cattle, sheep and goats (eggs in faeces) ↓ Eggs hatch in water ↓ Larvae in snail ↓ Young flukes attach to grass. ↓ Cattle eat grass with fluke ↓ Adult fluke in liver of cattle	Cattle sheep and goats	Immature liverflukes causes liver damage. Adult liverflkues cause anaemia and bottle jaw.	Destroy snail and slugs with chemicals. Deworm animals through injections, drenches and pour-ons
Roundworms	Eggs in faeces ↓ Embryo in faeces ↓ Larvae on grass ↓ Adult roundworm in sheep	Cattle, sheep and goats	Anaemia. Death through toxin secretion which weakens animals	Dose with broad-spectrum anthelhelmintics

Financial implications	Detrimental effects of internal parasites
• Reduced farmer income/profits which impacts negatively on farm labourers	• liver fluke **causes liver damage**
• Stock losses due to death	• feed on blood and **cause anaemia**
• Loss of production	• Toxins **lead to black disease**
• High treatment/medicine	• Infested animals can get *wasting disease, oedema (bottle jaw)*
• *Labour costs will increase* at times of livestock treatment	•
• veterinary costs.	•

Preventative measures	**Chemical Control measures**	**Biological control measures**
Provide balanced nutrition to animals.	*Dose animals with the appropriate treatments/medicine*	Dung beetles are helpful in removing manure
Give animals clean drinking water.	Chemical medicines and remedies, such as anthelmintics,	Introduce natural enemies such as birds
Provide good hygiene	Deworming drugs	The use of micro fungi
Practice rotational grazing to break the life cycle of parasites	destroying the intermediate hosts (snails and slugs) by using flukicides	nematophagous mites and predacious nematodes
Breeding of animals that are resistant to parasite infestations		earthworms feed on animal faeces and contribute to the breakdown of faecal pats
Wet pastures must be avoided to prevent the snail hosts		
Resting of infested pastures		

EXTERNAL PARASITES

These are parasites that live on the skin of host organisms and feed on their blood.

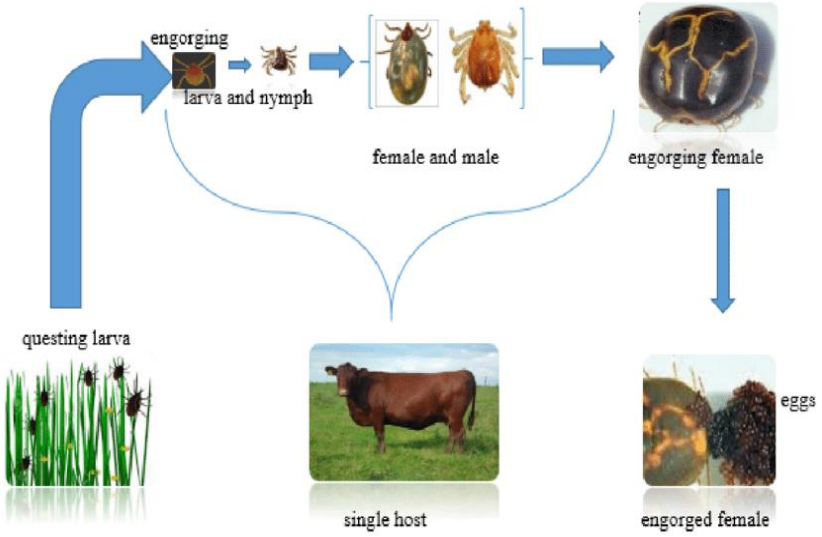
These include Ticks, Mites, Lice, Nasal Worm and Blowflies.

(Mi Ti Li Nas Blo). (Meat Li nice bro)

1.Ticks

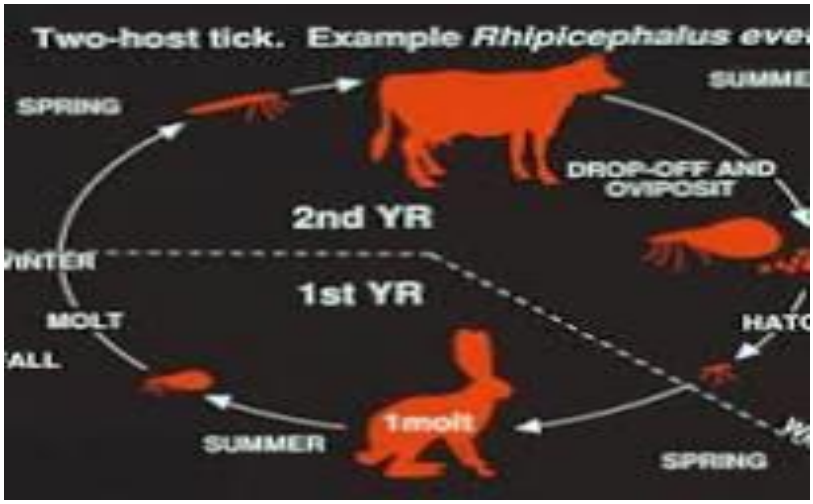
Suck blood and transmit diseases.

Ticks have eight legs and live on the skin of host organisms. They suck blood from the host and transmit diseases from an infested animal to previously uninfected animal.



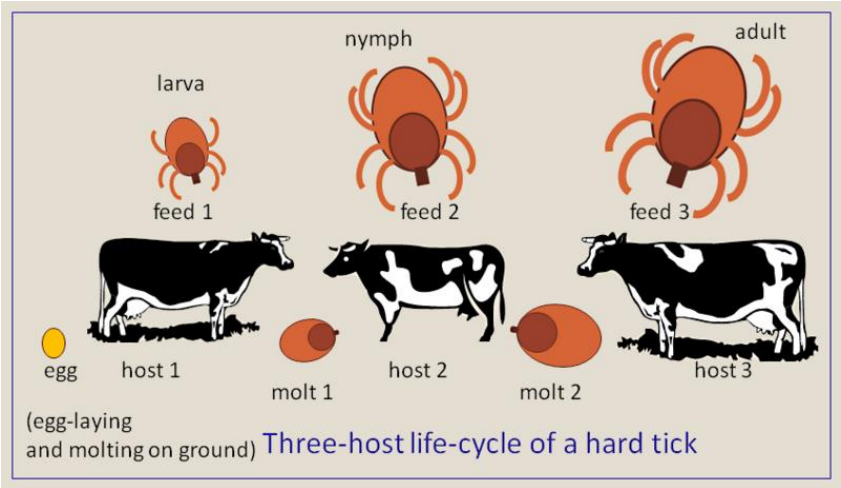
Life cycle of a single host tick

Blue tick



Life cycle of a two-host tick

Red legged tick



Life cycle of a three-host tick

Bont tick

Life cycles of ticks (simplified) **ELNA(Eggs, Larvae, Nymph, Adult)**

One-host ticks (Blue tick)	two-host ticks (Red-legged tick)	three-host ticks (Bont tick)
Eggs ↓ Larvae ↓ Nymphs ↓ Adults	Eggs ↓ Eggs hatch to six-legged larvae ↓ Larvae moults to nymph on first host ↓ Nymph moults into adult and attach to second host for feeding and mating	Eggs in winter ↓ Larvae in first host ↓ Larvae moults to nymph on second host ↓ Nymph moults in adult and leave second host ↓ Adult attach to third host for feeding and mating

Mites

Mites are very small and cause various diseases and problems.

Damage caused.

These are groups of insect-like organism which bite or cause skin irritations to their host organisms. They live on their hots for their entire life and infect the heads, body or tail area of their victims.

- Animals become restless.
- Loss of appetite

Lice

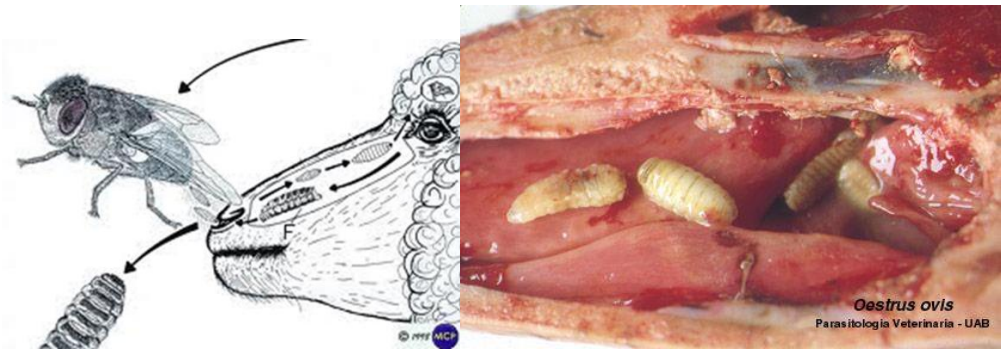
Lice live and multiply on the same host..

Lice are flat in structure and cause irritation and rubbing to cattle. There are **two** types which are : biting and chewing mouth parts

Damage caused.

- Skin irritations
- Inflammation
- Loss of appetite(anorexia)

Nasal worm



These are larvae of sheep bot fly. They only affect sheep and goats but not cattle.

Damage caused.

Fly lays the larvae around the nostrils during summer months.

- They cause irritation and infection.
- The maggot/larvae then enter the nasal cavity and feed causing severe thick yellowish discharge.
- Animal loses condition.

Blowflies

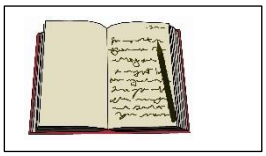
.

Blowfly strike mainly affect sheep which lay their egg on living sheep. They prefer warm and humid conditions. They prefer to attack the withers, flank and tail part of the sheep.

Financial Implications	Detrimental effects of External parasites
• Death of animals	• Skin damage
• Loss of income/profit	• Stress, restlessness and lack of appetite
• Chemical control is expensive.	• Painful bite wounds
• Loss of production.	• Open sores cause diseases
•	• loss of teats, ears and the tips of tails, and cause abscesses and lameness
• Both quality and quantity of wool is reduced	• Anaemia, as a result of the large volume of blood sucked .
• **cost of expensive equipment**	• Death due to large numbers of ticks.
•	• Irritation to animal
•	• External parasites can also act as vectors

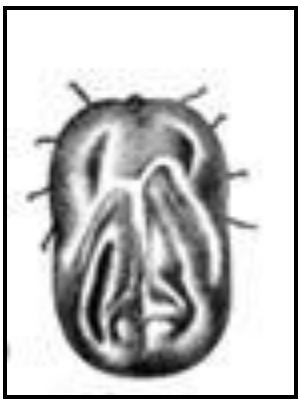
Preventive and control measures for external parasites	Chemical control	Biological control
Use Integrated Pest Management (IPM) approach.	Use of insecticides as dusts, pour-ons	Introduce natural rnemies such as birds
Rest contaminated pastures.	Dose with chemicals	
Vaccinate cattle against tick-borne diseases	Apply chemical around the infested areas	Using insect growth regulators break the life cycle of the blowfly .
Practice good hygiene.	Inject chemicals such as ivomec & ivermectin	Keep poultry near water holes and animal shelters to eat the ticks
Tail docking	The chemicals that are used to treat cattle against ticks are called acaricides	
. Trapping of blowflies		

ACTIVITY 8. **(20 marks 25 minutes)**

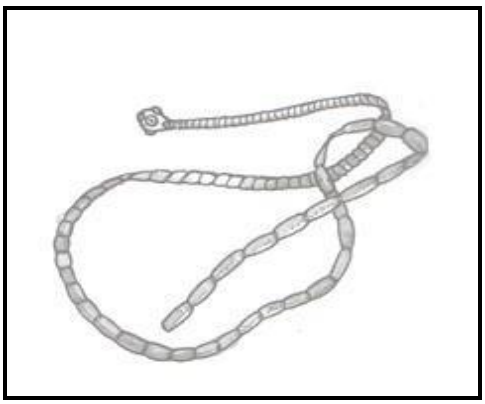


8.1 The pictures below show parasites affecting farm animals.

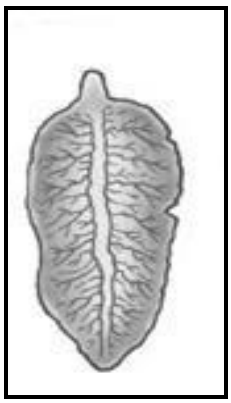
PARASITE A



PARASITE B



PARASITE C



8.1.1 Classify parasite **A and B and C** according to their life cycles.(3)

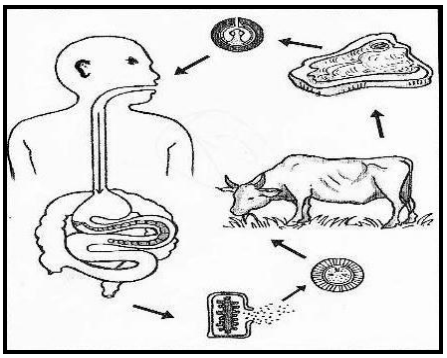
8.1.2 Name the protozoan disease that is transmitted by the parasite in QUESTION 8.1.1 (1)

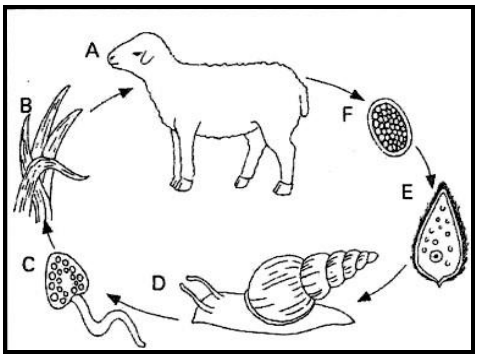
8.1.3 Write down the letter of the parasite to which EACH of the statements below applies:

(a) Its infestation can be controlled by destroying the snail. (1)

(b) It can cause bloated bellies in young animals. (1)

8.2 The diagrams below illustrate the life cycle of two different parasites.





8.2.1 Classify the parasite in **B**. (1)

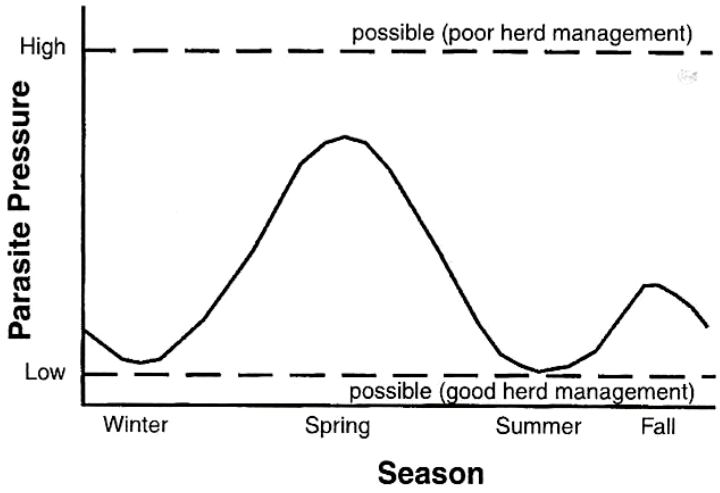
8.2.2 Name the parasites that are represented in **A** and **B**. (2)

8.2.3 State TWO biological measures that can be used to control the parasite **B**. (2)

8.3 Differentiate between the following pairs of terms:

(a) Internal and external parasite (4)

8.4 The figure below indicates the seasonal trends in the occurrence of parasites that vary with regard to season and management.



8.4.1 Name the season with the highest parasite pressure (infestation). (1)

8.4.2 Give a reason for the high parasite pressure (infestation) during the season mentioned in QUESTION 8.4.1 above (1)

8.4.3 State TWO good herd management practices that may lead to less parasite pressure (infestation). (2)

8.4.4 Suggest a way of diagnosing parasite infestations. (1)

8.4.5 State TWO economic impacts of internal parasites. (2)

20 marks

ACTIVITY 9 **(Marks 20 Time 25 minutes)**

9.1 The passage below deals with the infestation of bont ticks in livestock.

THE TICK CHALLENGE IN LIVESTOCK

Ticks play an important role as transmitters of diseases in animals, the type of which depends on the species of tick in question. Diseases such as redwater, gall sickness and heartwater are all acquired via tick bite and subsequent injection of the parasite that enters the bloodstream and causes the disease in the host animal. Production losses occur as a result of such tick-borne diseases by way of underperformance or even death of the infected animals.

Ticks with long mouth parts often create an opening in the skin of an animal that allows for the introduction of bacteria to deeper layers beneath the skin. This results in a loss of tail tips or ear lobes in cattle. In the eastern coastal regions of Southern Africa, the bont tick challenge has led to a loss of teat function in cows as a result of mastitis and abscesses in the udder.

[Source: *Farming SA*, September 2011]

9.1.1 Give TWO reasons why ticks are the most economically significant parasites in livestock farming by referring to the passage. (2)

9.1.2 Classify the bont tick according to its life cycle and give a reason to support your answer. (1)

9.1.3 Give a possible reason for a serious bont tick outbreak in the coastal region. (2)

9.1.4 Many fly species are also external parasites that bite and suck blood from their host. Name a fly species that attacks open wounds and tick bites in wool sheep breeds. (1)

9.1.5 Name TWO biological methods of controlling ticks. (2)

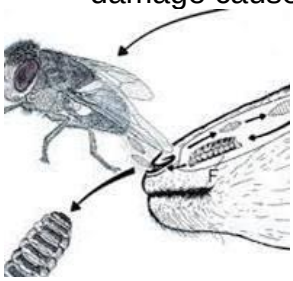
9.2 Mites are closely related to ticks but are much smaller and most cannot be seen by the naked eye. Mites are found on less hairy parts on the bodies of cattle, sheep, goats, pigs and horses.

9.2.1 Give a reason from the above extract to proof that mites are external parasites. (1)

9.2.2 Identify TWO non-ruminants in the extract that are affected by mites. (2)

9.2.3 Mites cause a proclaimed disease called mange. Explain a characteristic of this disease and name TWO responsibilities of the state in this regard. (3)

9.3.1 Identify the following livestock parasites and indicate one type of damage caused by EACH one of them.



(a)

(b)

(4)

9.3.2 Briefly describe how a sheep farmer can control infestation by parasite in (a) above.

(2)

20 marks

TOPIC 4: PLANT AND METALLIC SALT POISONING

Plant and metallic salt poisoning: EXAMINATION GUIDELINES

Plant and metallic salt poisoning

- **Identify and describe the maize fungus, poison bulb, thorn apple as examples of plant poisoning**
- **Discuss the treatment of animals suffering from plant poisoning**
- **Describe the preventative/control measures of plant poisoning**
- **Identify and describe common salt and urea poisoning (the symptoms and treatment)**
- **Indicate the preventative/control measures of salt poisoning**
- **Describe the basic principles of good health to control animal diseases and parasites/pests**
- **Indicate the role of the state in animal protection**

IMPORTANT TERMS AND DEFINITIONS

Aflatoxin	is a mould that is produced by maize fungus and is carcinogenic.
Alkalosis	excessive blood alkalinity that is caused by high levels of bicarbonate in the blood
Carcinogen	is any substance that promotes the formation of cancer.
toxicity	level of being poisonous or toxic

Poisonous plants

There are several examples of poisonous plants to life stock. Examples are maize fungus, poison bulb, thorn apple. Some others are: ''tulp'', senecioscis, lantana and ''gif

Source of plant poison	Description
Maize fungus 	A toxic disease resulting from eating damp maize by livestock.
Poison bulb 	This affects cattle that graze heavily on infested grazing land. Cattle are mainly infected when they graze on fresh leaves of poison bulb.

Thorn apple 	Seeds of the plant are poisonous and can cause death when eaten by cattle

Treatment of animals suffering from plant poisoning.

- Animals should be prevented from ingesting any more poisonous plants.
- Move animals to a clean camp.
- Do not give animals drinking water for up to two days.
- Chemical treatment with sodium permanganate followed by large doses of laxatives.
- Use activated charcoal in some cases.

Preventive and control measures of plant poisoning

- Keep animals in good condition during the dry season.
- Camp off areas containing poisonous plants.
- Avoid overgrazing pastures.
- Farmer must know poisonous plants in the area and keep animals away from them.

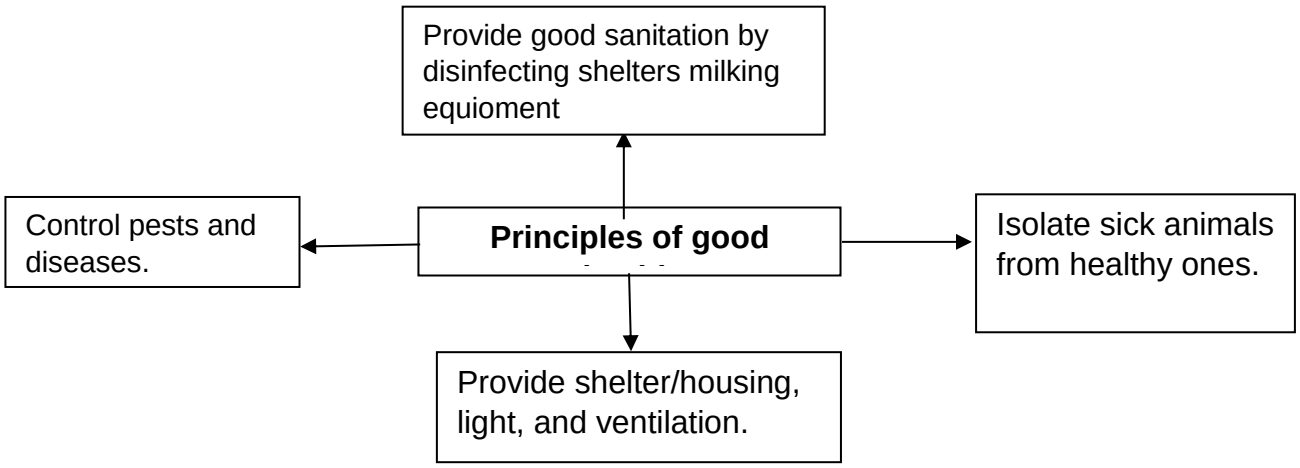
Metallic salt poisoning

Type of metallic poisoning	**Symptoms**	**Treatment, Prevention, and control**
Common salt  Salt is one of the essential nutrients needed by all animals but seriously lacking in grazing pastures. It is supplemented mainly as mineral licks to cattle	• Acute sensitivity to touch • Excessive salivation • Constipation • Animal becomes thirsty.	• **Treatment** • Remove source of salt poisoning immediately • Provide small quantities of fresh water at short intervals. • Treat small animals with hypertonic dextrose solution **Prevention and control** • Camp off areas having poisonous plants.

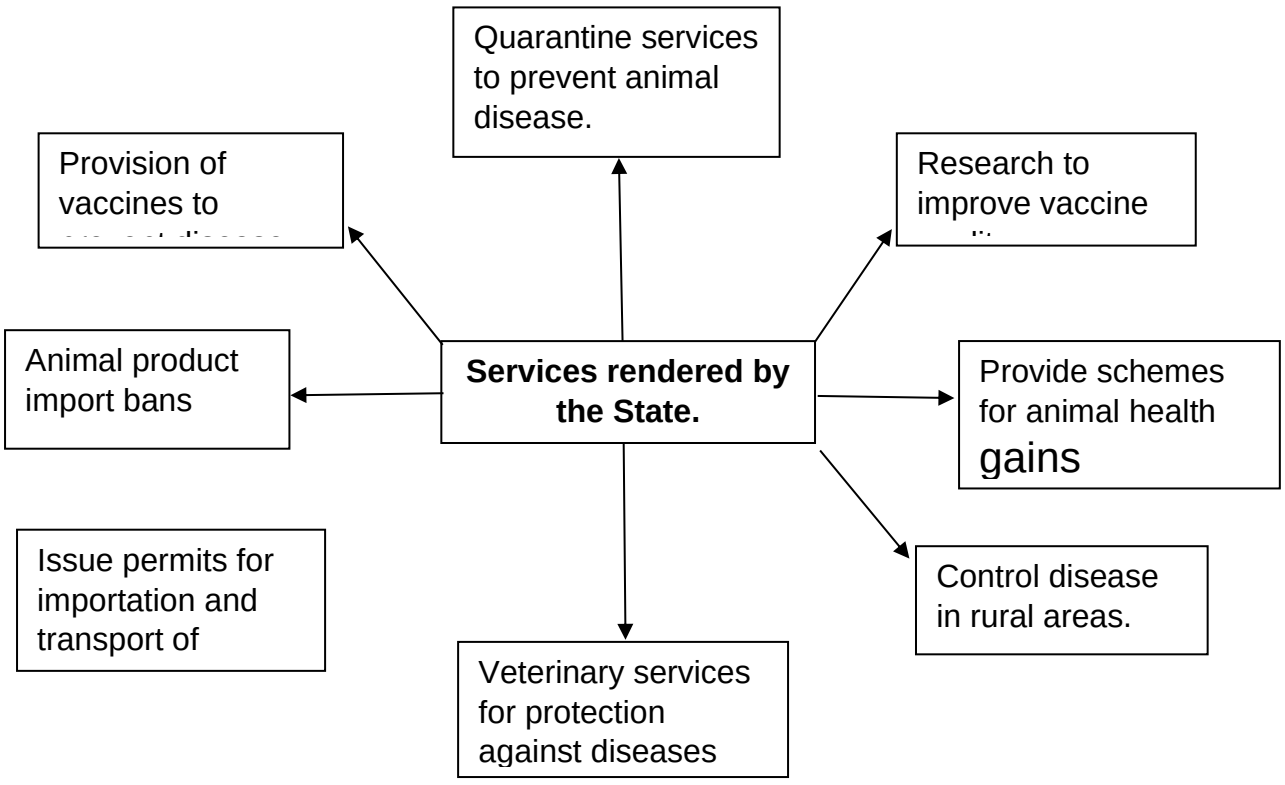
		• Practice rotational grazing • Provide balance nutrition • Remove poisonous plants from pastures
Urea  **Urea is supplemented as non-protein nitrogen (NPN) in feed supplements to mainly ruminants. Excessive amounts in feed can poison animals.**	• Animals secrete saliva excessively. • Lack of balance/stagger and may die a few hours later. • Animals may bloat. • Painful muscular cramps(tetany) • Weakness and frequent urination	• **Treatment** Give vinegar to animals to neutralize the alkalosis. In severe cases, use stomach tube to administer the medication. **Prevention and control** • Urea supplemented should not exceed 1% of total ration. • Avoid feeding wet urea to cattle. • Give animals access to enough clean drinking water

TOPIC 5 ROLE OF STATE

Basic Principles of Good Health to control animal diseases and parasites.



Services rendered by the state in animal protection.



ACTIVITY 10

10.1.1 Define the following terms.

(a) Aflatoxin (2)

(b) Toxicity **(**2)

10.2 **Salts can be toxic to farm animals. Precautions should be taken to minimise the risk of salt poisoning.**

10.2.1 Give TWO symptoms of salt poisoning in farm animals. (2)

10.2.2 State TWO ways in which a farmer can treat an animal with salt poisoning (2)

10.3 Identify the control measures a farmer may take to prevent plant poisoning in EACH of the following situations:

10.3.1 Animals graze after being transported for a long distance (1)

10.3.2 Animals feed on hay kept in stables (1)

10.3.3 Overgrazed or overstocked camp (1)

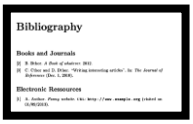
10.4 Farmers need to be aware of plants that pose a danger to livestock because they are poisonous.

10.4.1 Name FOUR plants that are normally found on natural pastures and could be poisonous to animals. (4)

10.4.2 Indicate THREE measures the farmer can take to prevent plant poisoning. (3)

10.4.5 Identify TWO key roles played by the state in animal disease protection (2)

(20)



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