

## ANIMAL SCIENCE

1. State the location in the animal body of each of the following.  
ureter, alveoli, aorta, duodenum and ileum.

Ureter is the tube connecting the kidney to the bladder in animals, it carries urine.  
Alveoli are found at the ends of the bronchioles in the lungs, they are used for gas exchange.

Aorta is the artery that carries oxygenated blood from the heart to the body in the Systemic system. It leaves from the left ventricle.

Duodenum is the first part of the small intestine leaving the Stomach.

Ileum is the next part of the small intestine and is responsible for absorption of digested materials like glucose and amino acids.

2. Oestrus in ewes can be synchronised artificially by the farmer.

- a) Explain how synchronisation is carried out on the farm.

Sponging is carried out by inserting progesterone soaked sponges into the ewes vagina and removing them after 12 days. All ewes come on heat 2-3 days later.

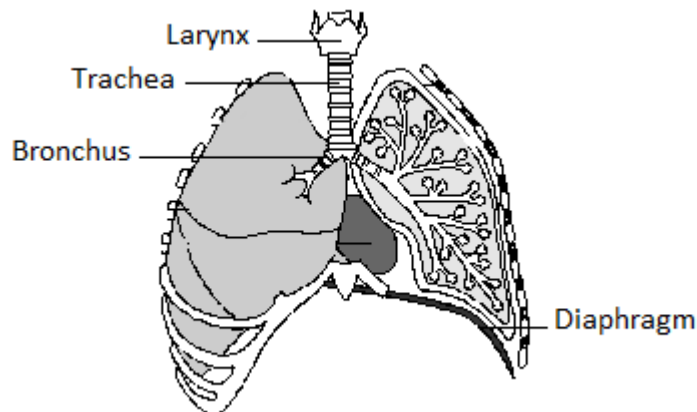
- b) State one benefit of synchronisation to the farmer.

All the ewes will lamb together and you will have a very contracted lambing period, making it easier for a mixed farmer to plan the year and have calving at a different time.

- c) How long is the gestation period in sheep?

5 months.

3. Use a labelled diagram to show the location of each of each of the following in a farm animal: Larynx, Trachea, Bronchus and Diaphragm.



4. Mention three organs that are involved in the process of excretion in the animal body.

Skin, Lungs and Kidneys.

5. Name two reproductive hormones produced by farm animals.

Oestrogen, testosterone, progesterone

6. Mention any two functions of the liver.

Produces bile. Stores Glycogen. Removes toxins from body. Deamination (breakdown of amino acids).

7. State two materials that are stored in the liver.

Glycogen and vitamins A, D and K. Iron

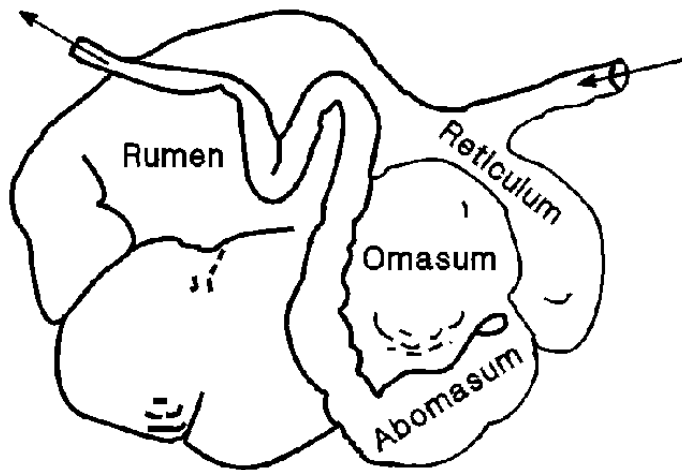
8. Mention three constituents of the blood.

Plasma, platelets, red blood cells (erythrocytes) and white blood cells (lymphocytes).

9. What is the function of the placenta in mammals?

The placenta provides food and oxygen for the developing young mammal and removes wastes like water and carbon dioxide.

10. Draw a labelled diagram of the stomach of a ruminant animal.



11. Name one important animal parasite from each of the following phyla:

Platyhelminthes, Nematoda, Arthropoda.

Platyhelminthes: liver fluke

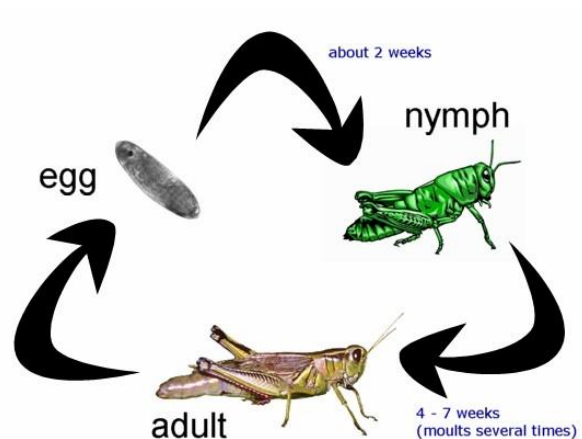
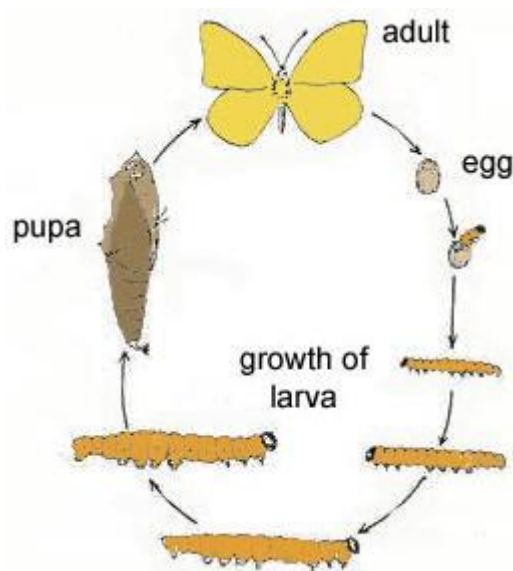
Nematoda: lungworm

Arthropoda: tick

12. Using examples, distinguish between complete and incomplete metamorphosis.

Complete: Cabbage white butterfly

Incomplete: Greenfly



13. Name an animal of agricultural importance from within each of the following phyla.

Annelida, Mollusca, Arthropoda.

Annelida: Earthworm

Mollusca: Mud snail (secondary host of liver fluke)

Arthropoda: Bees (pollination)

14. Name two ruminant animals and explain briefly the role of microorganisms in aiding digestion in a ruminant.

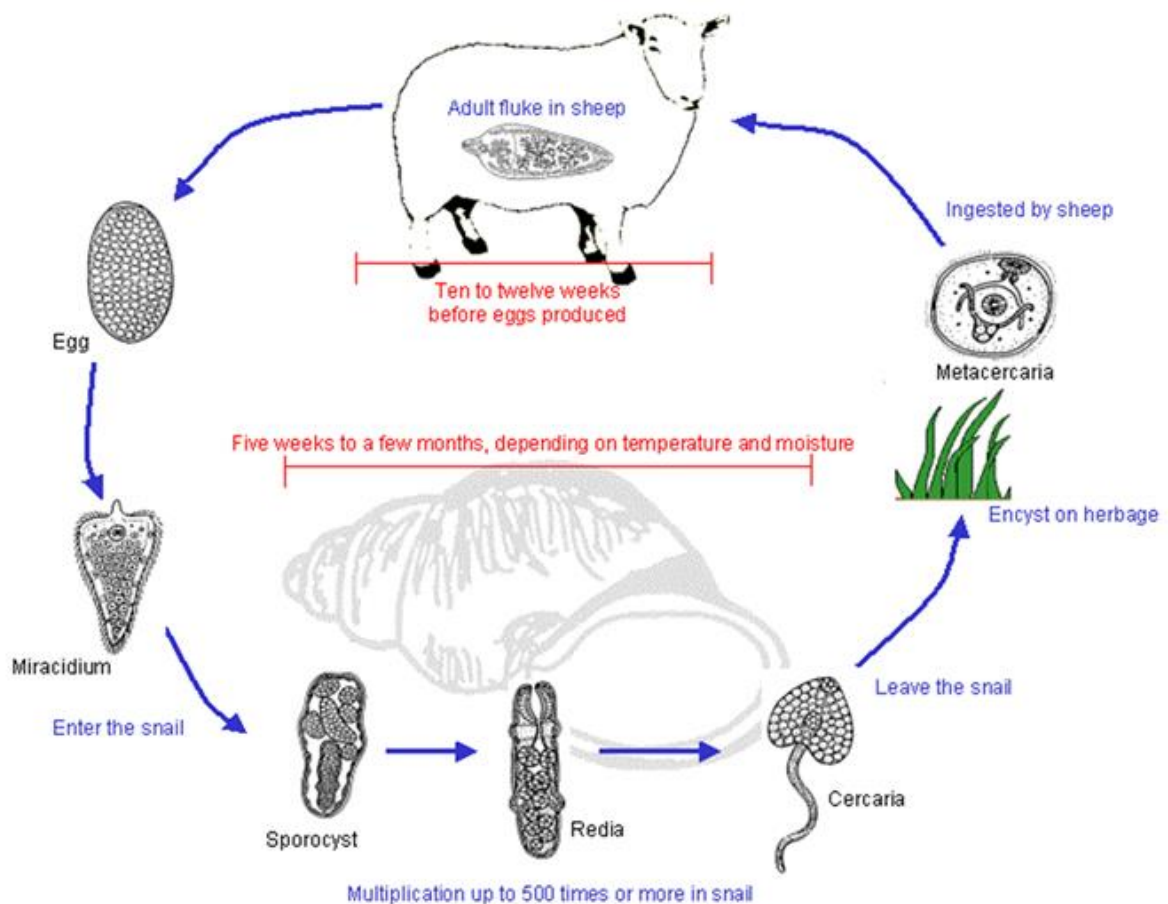
Cattle and sheep

Microorganisms in the rumen consist of protozoa and anaerobic bacteria that breakdown cellulose in the rumen into a form that the ruminant can digest. They also contribute to protein content as they are also digested.

15. Describe briefly how fat is digested in the body of a monogastric (single stomach) animal.

Bile from the gall bladder emulsifies the fat in the duodenum of the small intestine. This breaks the fat globules to droplets, giving a larger surface area for the next stage. Fat is digested in by the enzyme lipase which is secreted by the pancreas. The enzyme breaks down fats into fatty acids and glycerol.

16. Describe, using diagrams, the life cycle of the liver fluke and explain how the knowledge of the cycle assists the farmer in controlling this animal pest.



The miracidium needs water to swim to the mud snail. The mud snail also needs a watery habitat. Removing the water interrupts the life cycle.

17. Name the stomach compartments of a named ruminant.

Rumen, reticulum, omasum and abomasum.

18. State two differences between plant and animal cells.

Cell wall, chloroplasts and large vacuole

19. Write brief notes on each of the following.

i. Embryo transplantation

Embryo transplantation involves the collection of embryos from a donor animal and implanting these embryos into a surrogate mother or recipient. Both cycles must be synchronised. Super ovulation is achieved by hormone injections. Fertilisation takes place and the embryos are flushed out of the uterus. They are examined and the embryo is placed in the surrogate mother.

ii. Performance testing

The comparison of a bull's performance by comparing its weight gain and food conversion ratio (FCR) with other bulls kept under similar feed and housing conditions.

iii. Progeny testing

The evaluation and performance of a bull's offspring compared to other bulls' offspring under similar feed and housing conditions.

iv. F1 seed varieties (see genetics)

20. Mention the location in the animal body of each of the following: incisor, oesophagus, radius, omasum and caecum.

Incisor: front biting teeth of an animal

Oesophagus: tube from mouth to the stomach

Radius: bone from elbow to wrist thumb side

Omasum: compartment in a ruminant before abomasum

Caecum: first part of large intestine important in rabbits

21. Explain the function of each of the following:

i. Masseter muscles

Chewing, moving the jaw, physical digestion or eating

ii. Saliva

Digestion, contains enzymes, forms bolus of food

iii. Reticulum

Regurgitation of food for chewing the cud. Area where foreign bodies, bits of plastic are found when cow eats them.

22. Describe a laboratory method to show how the activities of earthworms have an important role in the soil.

Set up a wormery as in diagram using different layers of soil, compost, chalk, and sand. Place some leaves on top. Water the layers and cover the glass with black paper to keep out light. Place some earthworms in the wormery and leave for a week, making sure the wormery doesn't dry out. Set up a second wormery but don't put any worms in. (Control)

After a week, remove the black paper and examine. You will notice channels in the wormery from the earthworms burrowing. Also, the layers will be mixed together and the leaves will have disappeared.



## Animals

	Calf/cow	Lamb/sheep	Bonham/pig
Weight at birth	40 – 45 kg	3 – 5 kg	1 – 1.5 kg
Weight at puberty	250 kg	40 kg	75 kg
Weight at slaughter	450 – 800 kg	30 – 40 kg	80 – 82 kg
Time to reach slaughter	1 – 3 years	4 – 6 months	6 months
Gestation period	9½ months 283 days	5 months 154 days	3 months 3 weeks 3 days 114 days
Length of oestrus cycle	21 days	17 days	21 days
Dental formula	0 0 3 0 4 0 3 3	0 0 3 0 4 0 3 3	3 1 4 3 3 1 4 3

<b>Growth targets for the replacement heifer</b>			
	January/February	April /out on grass	November/housing
Year 1	40 kg	72 kg	200 kg
	April/May to grass	November/housing	January/February
Year 2	300 kg	450 kg	500 kg

<b>Food Conversion Ratios (FCRs)</b>	
Weaners	1.75 :1
Fatteners	3.25 :1
Poultry	2 :1

<b>Target weights for pigs</b>	
Bonhams	1 – 1.5 kg
Weaners	9 – 32 kg
Fatteners	33 – 80/82 kg

<b>Ideal Temperatures for housing (pigs)</b>	
Farrowing house	20°C
Weaner house	24°C
Fattener house	22°C

**\*\* Lysine** – it is an essential amino acid added to weaner/fattener ration.

## Give a scientific explanation for:

1. Milking cows more frequently than twice daily increases their yields over a lactation period.  
*Milking and sucking stimulates milk production and milk let-down. The more often you milk, the more milk you will get but the quality suffers.*
2. A greater loss of energy by farm animals kept out of doors during the winter months in comparison to those housed indoors.  
*Some of the energy from the food is being used to keep the animals warm and to produce a winter coat.*
3. A low incidence of liver fluke in cattle grazing on a well drained pasture.  
*Miracidium needs water to swim to snail, snail lives in watery conditions so cannot thrive in well drained pastures.*
4. The production of carbon dioxide in the animal body.  
*Respiration is the release of energy from food. One by product of this process is carbon dioxide. Equation.*
5. The practice of including calcined magnesite in the diet of lactating cows in early spring.  
*Used to prevent grass tetany – the staggers. In well fertilised grass, an imbalance in magnesium can cause grass tetany.*
6. The presence of a red colour in the urine of a bovine animal.  
*Babesia spread by sheep tick, destroys the red blood cells and they appear in the urine. Known commonly as red water fever.*
7. Feeding 'beastings' to a calf after birth.  
*Beastings/colostrum is the first milk after calving. It is rich in nutrients and contains antibodies that the calf would not get any place else. It warms the calf up and contains a laxative that gets the digestive system going. 10% of the calfs body weight must be fed in beastings within the first 6 hours.*
8. Progeny testing of AI bulls  
*Progeny testing involves testing the calves growth rates and FCR compared with calves from other bulls kept under the same conditions. Progeny testing is more reliable than performance testing.*
9. The addition of soya bean meal to cereals in pig rations.  
*Soya bean meal is rich in protein, while cereals are low in protein and high in carbohydrates. High protein feeds increase muscle growth. Soya bean meal is high in lysine, and essential amino acid that pigs need and are not able to make in their bodies.*
10. Feeding bought-in calves only water and glucose for the first 24 hours on arrival on a farm.  
*The stomachs of young calves are extremely sensitive and do not take well to stress or sudden changes in diet, especially after transport. Water provides rehydration after transport. Glucose provides energy for the young calf. It helps prevent milk scour and allows the calf a gradual transition so it can be weaned onto milk replacer and concentrates.*
11. The practice of housing a boar near sows and the double serving of sows in a pig breeding enterprise.

*The sight and smell of a boar in a dry sow house brings on oestrus in sows, as boars produce pheromones. Boars can be used to identify when a sow is in heat. Double serving increases conception rates and increases litter sizes.*