

The 2017 student quiz questions and their answers

1. Give a breakdown on how the SASAS logo symbolizes animal science?



(Egg (the head), cow's head, grass blade, scale or balance = taking measurements)
= human practises livestock science

2. What is the image at the top of the SASAS Coat of Arms?

Cattle horns



3. In human nutrition, bioavailability of iron (Fe) is the highest in:

- a. **Liver**
- b. Spinach
- c. Ferric sulphate
- d. Dairy products

4. What component in red meat contains iron with a very high bioavailability, double that of other iron sources? **Haem as in haemoglobin.**

Animal source foods are considered good sources of the more bio-available haem iron. The absorption of haem iron is much less affected by other dietary factors and contributes significantly to absorbable iron.

5. What is NIR in nutrition? **Near-infrared reflectance (NIR) spectroscopy**

6. What is lyophilisation? **Freeze-drying**

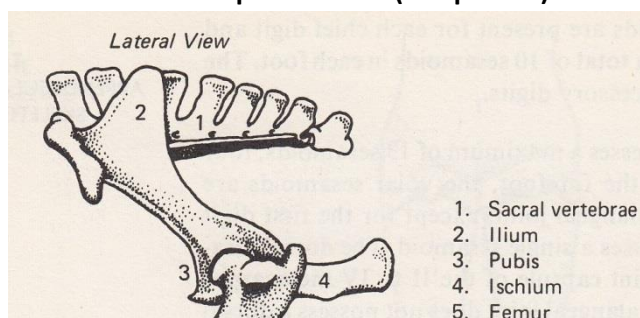
7. What term /name is given to an animal diseases that can be transmitted to humans ?. **Zoonosis (Zoonotic diseases)**

8. What is the symptom of brucellosis in cattle? **Contagious abortions**

9. What is the difference between the ileum and the ilium?

Ileum = Terminal portion of the small intestine

Ilium = Part of the pelvic bones (2 in picture)



10. How many primary wool follicles are there in a follicle bundle? **Three**

11. What are the differences between a wool fibre originating from a primary wool follicle vs one from a secondary wool follicle? Name one difference.

A follicle of a primary fibre has a muscle bundle (arrector pili) and a sebaceous gland

12. A hare / rabbit will not survive in the wild if it is prevented from doing what?

Practice coprophagy (eating their own faeces)

Rabbits are hindgut fermenters with the unique ability to produce through microorganisms in their caeca, soft faecal pellets high in vitamins and microbial protein. Usually hard faecal pellets rich in fibre are excreted during the daytime. At night these caecotrophs take these soft pellets from their anuses and swallow them. Coprophagy is a practice that has been observed in most hindgut fermenter even the horse, though many of them are not as specialized as rabbits and similar species, the so-called caecotrophs.

13. Last year (2016) a Ratite symposium was held in conjunction with the SASAS congress. What was this symposium all about? **Ostriches, emus**

14. Milk yield in livestock can be affected by an increase in the level of what hormone?

- a. Insulin concentration
- b. Thyroid hormones
- c. Growth hormone**
- d. Progesterone concentration

Dairy cows in the post-peak stage of lactation are injected subcutaneously with the growth hormone, bovine somatotropin (bST), and this increases milk yield by 10% to 15%. In the article by Erasmus & Webb (2013) SAJAS, vol. 43 page 425, a detailed discussion is given on the use and misconceptions regarding the bST treatment of dairy cows.

15. An ionophore such as monensin is used in ruminant nutrition as a growth stimulant / feed additive. What is it used for in poultry production? **As a Coccidiostat (against coccidiosis).**

The article by Erasmus & Webb (2013) SAJAS, vol. 43 addresses the safety of using ionophore additives in livestock production

16. What is a Meta-analysis in research?

Statistical processing and evaluation of all studies on a specific topic to obtain the mean response.

17. Why can carnivores digest bones much better than non-carnivorous species?

The lower pH of the stomach environment (pH 1) of carnivores

“The gastric acidity (gastric pH) of the stomach of a dog or cat eating a diet predominantly made up of raw meat is very low (very acidic), with a pH of 2 or lower (relative to the level of meat protein). This highly acidic environment favours the breakdown of raw meats, and raw bones, into soft digestible material. The low pH also is highly effective at killing bacteria, particularly potentially pathogenic bacteria like salmonella spp. clostridia, campylobacter and E coli. So the natural ‘wild’ diet of dogs and cats has evolved a gastric environment that favours the breakdown of raw meats, raw bones, and a pH that kills” potentially harmful bacteria – consistent with the requirements of carnivores, and in particular, the scavenging nature of dogs.”

18. If cannibalism develops in a flock of chicks, what should be done? **The birds should be de-beaked**

19. Muscles that have a very rapid and or extensive pH decline will be pale and have very low water-holding capacity. True or False? **True**

20. People in the vicinity of a nuclear power station are given iodine tablets to take in when a nuclear explosion does occur. Why?

Radio-active iodine is released during an explosion. An overdose of iodine will limit the absorption of the radio-active iodine which would otherwise cause cancer of the thyroid.

This is based on the principle of homeostasis in the metabolism of many mineral the body, i.e. the body absorbs an element according to requirements. If the digestive system is flooded with iodine the excess iodine will minimize the absorption of the radio-active isotope of iodine.

21. What is the metabolic condition associated with niacin deficiency in dairy cattle? **Ketosis**

22. At what stage of their respective reproductive cycles do cows and ewes develop ketosis?

Cows: after calving (parturition) and ewes before parturition (lambing).

23. What is the difference between blood plasma and blood serum?

When blood is collected in a test tube containing an anticoagulant, and centrifuged, the supernatant is called plasma. When blood is allowed to clot, the blood separates into a blood clot and the supernatant, serum.

The main difference between plasma and serum lies in the clotting factors. Fibrinogen is the main clotting factors and is retained in plasma. For most biochemical analyses there is little difference in the composition of plasma and serum. However, some of the copper containing blood substance, caeruloplasmin, is lost in clotting, and the copper concentration in plasma is 10% to 20% higher in plasma than in serum. When plasma is to be used in a biochemical analysis, it is essential to use the correct anticoagulant, because some anticoagulants will affect the concentration of the metabolite to be tested.

24. In defining Large Stock Unit (LSU) in South Africa, what is the reference mean digestibility of the roughage used? **55%**

In South Africa the norm for a "Large Stock Unit" (LSU): "An ox of 450 kg, gaining 500 g of weight per day on grazing with an average digestibility of 55%"

(See article in Applied Animal Husbandry & Rural Development, on the SASAS website: Mokolobate et al. 2017. Explaining the principle of large stock unit and its implications on grazing capacity.

25. Why should eggs be heat-treated before consumed by humans?

To destroy the biotin inhibitor (destroy biotin antagonist, avidin) (destroy vitamin inhibitor in eggs) Consuming a few raw eggs would obviously have no detectable effect.

26. Which of the following cuts of beef is likely to contain the least connective tissue?

a. Shank

b. Topside

- c. Brisket
- d. Neck

27. The main component of rhinoceros horn is:

- a. Carotene
- b. Keratin**
- c. Bone
- d. Tannin

28. Which food substance is not an antioxidant?

- a) β -Carotene
- b) Flavonoids
- c) Vitamin A**
- d) Vitamin C

Vitamin A is classified as not being an anti-oxidant, though some authorities have the view that vitamin A does have some anti-oxidant properties. The precursor of vitamin A, beta-carotene, is considered an anti-oxidant

29. A method in which an animal is immobilized and rendered unconscious instantly is called?

- a. Docking
- b. Electrical stimulation
- c. Stunning**
- d. Thawing
- e. Exsanguination

30. What cut of meat is used for making bacon?

- a. Pork Ribs
- b. Pork Belly**
- c. Loin of Beef
- d. Leg of Lamb

31. What is the membrane lining of the abdominal cavity called?

- a. Periosteum
- b. Peritoneum**
- c. Viscera
- d. Epimysium

32. Which feedstuff is **not** a good source of calcium to chickens?

- a. Sea shell grit
- b. Wood ash
- c. Hoof and horn meal**
- d. Snail shell

Hoof and horn meal contains approximately 2.4% Ca, because it consists mainly of the protein, keratin, and has a protein content of 72%. The Ca level of wood ash ranges between 20% to 35% and ash is a good source of Ca. Snail shells (in the article I read, snail shells were collected from restaurants in Nigeria) contained 33% Ca, close to that of lime stone that contains between 33% and 38% Ca.

33. What is the normal ultimate pH range in animals' post-mortem?

- a. 4.9-5.1
- b. 5.5-5.8**
- c. 6.5-6.8
- d. 7.0-7.5

34. The proline-containing protein in saliva of concentrate selector is an affective binder of:

- a. Tannin**
- b. Polyethelene glycol (PEG)
- c. Keratin
- d. Lignin

35 Which component is not measured as a part of the **neutral detergent fibre (NDF)** fraction?

- a. cellulose
- b. lignin
- c. pectin**
- d.. hemicellulose

36. This animal species is classified as a pseudo-ruminant:

- a. Hippopotamus
- b. Kangaroo
- c. Giraffe
- d. Camel**

Although the camelids (camel, llama, alpaca) chew their cud, they are not classified as ruminants because they have a three-compartmented stomach, lacking an omasum. They belong to the suborder, Tylopoda (padded claws), and not the Ruminantia, and are called pseudo-ruminants.

37. Two roughages with the same dry matter digestibility and similar in all other respects contain 12% and 16% crude protein. How does the **apparent protein digestibility** compare between the two samples

- a. It is the highest for the 16% CP roughage**
- b. It is the highest for the 12% CP roughage
- c. Apparent protein digestibility should be the same
- d. Not possible to predict.

There is a very high positive correlation (0.976 - 0.997) between the protein concentration in a ruminant feed and the apparent digestibility of its protein (See the extract from an article from the Proceedings of the South African Society of Animal Production (1967) below). The reason is: The amount of metabolic faecal nitrogen (MFN) excreted, is determined by the amount of dry matter taken in, i.e. it is a constant per g DM taken in. True protein digestibility is over 80% (with some exception where N is for instance attached to lignin). Therefore, the lower the protein (N) level of the feed, the higher the proportion of MFN in the faeces relative to faecal N from dietary origin, and the lower the apparent protein digestibility of the feed. When feeds contain very little protein, < 4%, more N is excreted than taken in, and a negative apparent protein digestibility is recorded (bottom of graph). (See also Church, 1984. Digestive Physiology and Nutrition of Ruminants, Volume 2, page 31). (This applies irrespective of the proportion of rumen degradable and undegradable protein in a protein source because true protein digestibility is high in both fractions.)

See below page from article in 1976 from Proceedings of the 7th congress of the South African Society of Animal Production

Results and Discussion

1. Relationship between the crude protein and apparently digestible crude protein content of feeds

The linear regression equations for the percentage of crude protein on the percentage of apparently digestible crude protein (DM basis) in each of the six feed categories are listed in Table 2. It will be seen that highly significant linear correlations (0.976 to 0.997) exist between these two variables for all types of feed studied with the exception of silages. The particularly close relationship between the two variables under study and the similarity of the equations developed are quite remarkable considering the

wide range in the chemical composition and botanical nature of the feeds involved. This relationship is also illustrated in Figure 1.

Although the regression equations for the two main feed categories (dry forages and pastures) were found to be statistically different ($P < 0.01$) these differences are in fact of little practical significance. It is, nevertheless, of interest to note that if the Y-intercept of the regression line is accepted as an estimate of metabolic faecal protein excretion (in g per 100g DM consumed), then the difference in protein digestibility between dry forages and pastures can be attributed to the smaller excretion of metabolic faecal protein when the latter feeds are fed. This results in the slightly higher digestion of protein per

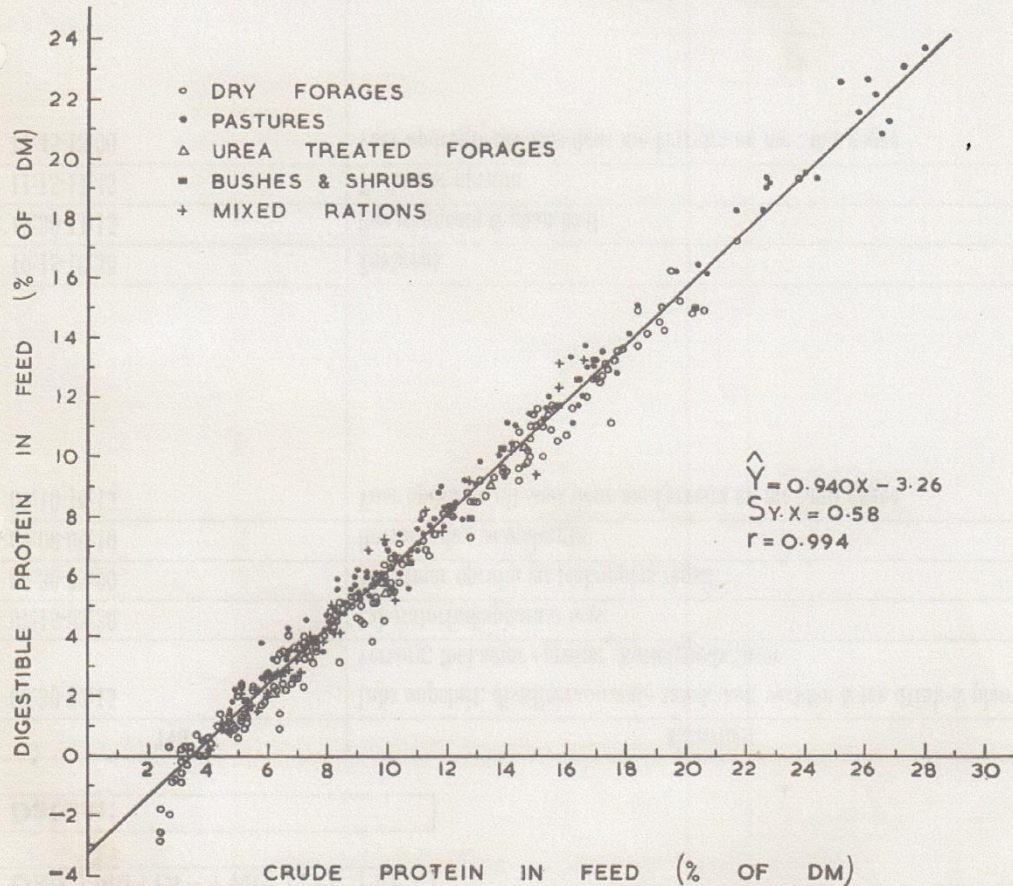


Fig. 1.—Relationship between the crude protein and apparently digestible crude protein concentration of feeds