

Student quiz 2019

Departments were notified in advance (e-mail of 9 April 2019) that quite a number of the quiz questions will cover aspects of scientific writing and publication.

Questions and answers are grouped into categories and are not in the sequence they were asked:

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Publishing and scientific writing

1. SAJAS follows the SI Metric system of presenting digits and symbols in articles. Which is the correct way of presenting fifty grams in an article?

- a) 50g
- b) 50gm
- c) 50 g (50 space g)
- d) 50 gm (50 space gm)

2. In scientific writing, which expressing of what is present in a sample, **IS NOT CORRECT?**

- a) Three levels, 0%, 5% and 10%, of the supplement were fed
- b) Copper content in blood serum is 0.6 mg/L Cu
- c) The activity of the enzyme, aspartate aminotransferase, is 101 UI/L in serum
- d) The diet contained 0.95‰ of the antioxidant

From SAJAS instructions: Do not use the word “content” when specifying a concentration in terms of, for instance, g/kg or %. Because “/L Cu” can lead to confusion, rather write 0.6 mg Cu/L.

Note: a) is the correct way of presenting percentages; c) Enzymes are expressed in terms of activity not as concentration; d) ‰ = per thousand, called per-mille e.g. one percent = 10 per-mille or 10‰. (‰ has been used by Zhen et al 2019 SAJAS (49) issue 1).

3. What does R^2 stand for in scientific calculations and writings?

- a) Correlation coefficient
- b) Simple linear regression
- c) Coefficient of determination
- d) Residual standard deviation

4. In scientific writing in which sentence is an incorrect word (in red) used?

- a) The best **parameter** for indicating the efficiency of an animal, is feed conversion ratio.
- b) The **sex** of the animals will be recorded.
- c) A strict **regimen** is followed to obtain correct results.
- d) The animals were **vaccinated** against diseases.

The word, parameter, is probably almost always used incorrectly by authors of articles in SAJAS!

From book on scientific writing:

Parameter – “Reserve this word for its specific statistical meaning of a potential variable to which a particular value can be assigned to determine the value of other variables. **Do not use parameter to mean measurement, value, indicator or number.**”

Gender vs sex: Gender is cultural, and is the term to use when referring to men and women as social groups. Sex is biological; use it when the biological distinction is predominant.

Regimen versus regime? ‘Regime’ is used for an authoritarian government or a systematic way of doing things, a regular pattern or behaviour.

‘Regimen’ is used for a systematic approach to diet, exercise, and medicine, such as a training system or a health plan.

5. In scientific writing, when an error occurred in an article, what is the correction called when it is corrected in a subsequent issue of the journal?

- a) A corrigenda
- b) A footnote
- c) A retraction
- d) An errata

6. A Latin square design consist of:

- 1) 3 animals 3 treatments 4 periods
- 2) 4 animals 3 treatments 4 periods
- 3) 4 animals 4 treatments 4 periods
- 4) 4 animals 4 treatments 3 periods

7. What is wrong in Fig 11.9 from the book of Suttle (2010)?

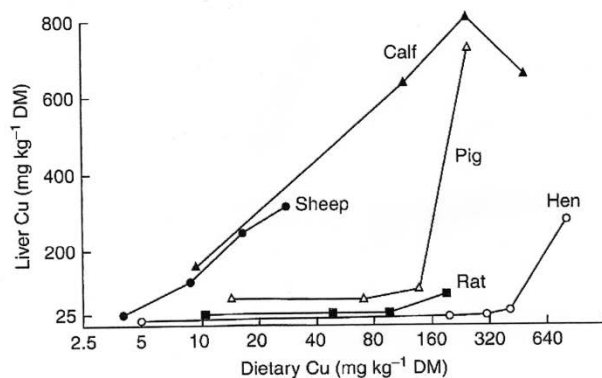
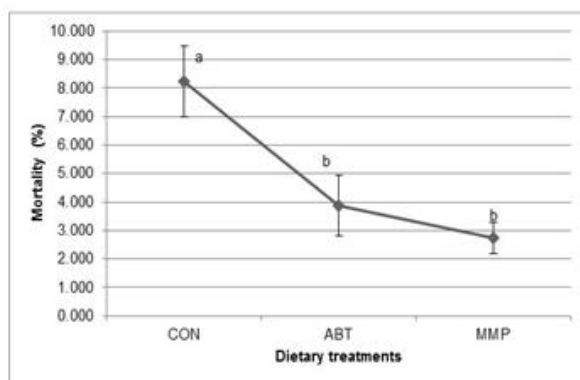


Fig. 11.9. Species differ in the extent to which they store excess dietary copper in their livers. Ruminant species, for which the risk of copper deficiency is ever-present, store copper avidly while non-ruminant species, which are rarely at risk, do not.

The values of both the x- and y-axes are not presented on scale, e.g. distance on the x-axis between 2.5 and 5 is the same as the distance between 320 and 640 dietary Cu.

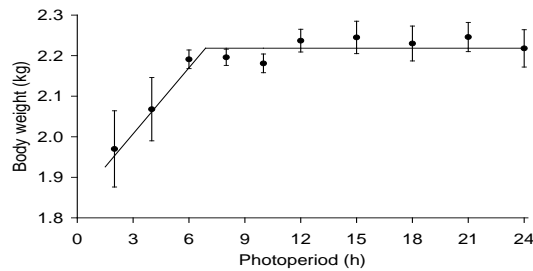
8. What is wrong in this figure?



Effect of dietary treatments on overall mortality rate (%) of broilers during 0 to 5 weeks of experimental period
 CON = Control (Corn-soybean meal based basal diet);
 ABT = Basal diet + Chlortetracycline-HCl;
 MMP = Basal diet + Multi-microbe probiotic

The treatments are independent of one another. Should be a bar chart (or histogram)

9. Dose-response trial



Body weight at 35 days of broilers reared at different photoperiods

In SAJAS' "Instructions to Authors" it is stated: "It is incorrect to use a bar chart when illustrating a dose-response trial" Why?

A bar chart implies that the treatment levels are independent treatments, which they are not.

10. In scientific writing, what does ORCID stand for?

Persistent digital identifier of an author (unique code for each individual author) *Just explain*

11. Why is a DOI given to a published scientific article?

Digital Object Identifier identifies each article – unique world-wide. *Just explain*

12. Which general breeding concept can be used as a guide to the number of animals to be used in animal production experimentation?

Heritability. The lower the h^2 of a trait, the more animals are required.

13. In experimentation, what is the difference between laboratory replication and repetition (or experimental replication)?

Laboratory replication is sub-samples of the same material vs repetition: different samples of the experimental material in question.

14. What is the correct statistical procedure of analysing continuous data (e.g. body weights taken over time)?

Present slopes using regressions for each trait in turn, and test whether the slope is statistically significant.

Ethical aspects in publishing

1. What is "Science with an agenda" ?

- Research using an hypothesis
- Research planned with a pre-set goal of what the outcome should be**
- Research conducted, following a very detailed protocol
- Manipulating the evidence (results) because the cause is noble

An interesting example of b):

A Frenchman, Gilles Séralini, apparently a known activist against genetically modified (GM) foods, published an article in the journal, Food and Chemical Toxicology, claiming that he proofed that GM maize causes an increased risk of cancer in rodents. Scientist world-wide reacted negatively on the merits of the study:

Press Release (28 November 2012):

"Serious defects in the design and methodology of a paper by Séralini et al. mean it does not meet acceptable scientific standards and there is no need to re-examine previous safety evaluations of genetically modified maize NK603. These are the conclusions of separate and independent assessments carried out by the European Food Safety Authority (EFSA) and six EU Member States following publication of the paper in the journal Food and Chemical Toxicology on 19 September

2012.” The article was retracted by the journal, but anti-GM activists still use the article as evidence of the dangers of GM products.

2. In scientific writing, what does “salami-slicing” refer to in the publishing of articles?
- Publishing the same research results in different languages in different scientific publications.
 - Adding the name of a colleague (not involved in your research) as co-author on your paper with the agreement that s/he shall put your name on a paper of her/his.
 - Private company selectively publishing only results from product evaluation studies when the results are positive / favourable for their products.
 - Split clearly related aspects of a study arbitrary into more articles than really sensible to get more publications out of the study.

3. In scientific publications, what is a “gift author” or “gift authorship”?

If an author has not made any scientific or intellectual contribution to an article on which his/her name appears, e.g. when a senior (e.g. HOD) insists on putting his/her name as author on all articles published by his/her research unit.

Animal breeding and genetics and reproduction

1. What is complementarity in animal breeding?

- Response of additive gene action in a crossbreeding programme
- The ultimate response of heterosis in crossbreeding
- A superior male complements the defects in a female herd / flock
- The loss of heterosis when further backcrossing with the F1 cross-breds is made

2. What is a heterozygote?

- Individual with more than one colour
- Individual with two different alleles of a gene
- Individual with the same allele on different genes
- Individual with multiple genes

3. What is the meaning of oviparous?

- live birth
- hatched from an egg
- multiple births
- birth of a single young

4. Which measurement (tool) in animal breeding is based on metabolic body size?

- Kleiber ratio
- Heritability
- Mature body weight
- Feed intake

5. What is the term for heritable changes in gene expression that occur without any changes in the DNA sequence?

- Nutrigenomics
- Epigenetics
- Proteomics
- Heritability

6. What is achieved with selection for “Residual feed intake” in cattle breeding?

- Cattle that grow faster
- Cattle with high feed intakes

- c) Cattle that is adapted to feed resource limitations
- d) Cattle that eat less, but growth rate is not changed

7. In animal breeding, what does MOET stand for?

Multiple ovulation and embryo transfer

Diseases and management

1. Mad-cow disease (Bovine Spongiform Encephalopathy (BSE)) is caused by:

- a) A recessive gene
- b) Cattle eating meat products
- c) A virus
- d) Prions

2. What is the “sell-by” day after packaging of chicken eggs in a shop?

- a) 21 days
- b) 25 days
- c) 32 days
- d) 40 days

3. Which fatty acid is **not** one of the Omega-3 complex?

- a) α -linolenic acid (ALA, C18:3n-3),
- b) linoleic acid (LA, C18:2)
- c) eicosapentaenoic acid (EPA, C20:5n-3)
- d) docosahexaenoic acid (DHA, C22:6n-3)

4. This component in urine is highly correlated with the protein content of the body, measured to get an estimate of percentage bodily protein:

- a) creatinine
- b) urea
- c) biliverdin
- d) allantoin

5. What is a Prebiotic?

- a) Precursor of a probiotic
- b) Direct-fed microbial
- c) Non-digestible feed additive stimulating growth of beneficial bacteria in the digestive tract
- d) Exogenous digestive enzyme

6. Approximately how many cervical (neck) vertebrae do chickens have?

- a) 7
- b) 10
- c) 13
- d) 17

7. Probiotics and prebiotics are widely used in animal nutrition. What is synbiotics?

Combination of probiotics and prebiotics

8. Which period in a cow’s life cycle is termed the “transition period”?

21 days prior to calving

9. When does the puerperium period occur in a female?

It is the time in the female after parturition, where the reproductive system undergoes repair which will allow the female to cycle again.

10. What is the function of the “bursa of Fabricius” in the body of a chicken?

Part of lymphatic system - immunity

11. In a dairy cow, at what stage of lactation is injections of b-somatotropin most effective? 60-90 days after parturition, after she became pregnant, after peak of lactation (Any one of them)

12. What is innate immunity in chickens?

Chickens born with mechanisms that provide short-term protection against pathogenic organisms.

13. What is the difference between a carcass classification system versus a carcass grading system?

Grading implies one is better than the other whilst a classification classifies according to a set level of criteria and leaves it to the consumer to decide what is superior.

14. Which cattle breed in South Africa use to have a genetic problem of unilateral hypoplasia of the testicles? Nguni

15. What is the toxic substance present in fish meal that causes problems in chickens?

Gizzerosine Affecting the gizzard.

16. Comment on the following statement in the newspaper, “Beeld”:

“Owing to the high oestrogen levels in milk from pregnant cows, humans should refrain from drinking cow’s milk because of an increased risk of cancer.”

During pregnancy, the oestrogen level in milk are zero or very low.

Beeld ignored objections by SASAS and others (based on studying the original publications) to this fake news and disinformation .

17. In meat science, what does FAME stand for? Fatty acid methyl esters

Nutrition

1. This anti-nutrient component in plants binds and thus reduces mineral absorption from the digestive tract of monogastric animals:

- a) Phytic acid
- b) Prussic acid
- c) Tannins
- d) Nitrate

2. What is the scientific name of the Sweet Thorn tree in southern Africa?

- a) Acacia karroo
- b) Combretum apiculatum
- c) Acacia sieberiana
- d) Vachellia karroo

The scientific name, Acacia, for African thorn trees has been changed to Vachellia when Australians managed to claim the name, Acacia, solely for their trees. The only Acacias in South Africa now are species from Australia such as the wattles and the Port Jackson.

3. Which **cannot** be a consequence of acid rain (H₂S pollution) in a region?

- a) Decreased molybdenum concentration in plants
- b) Decreased accumulation of selenium in the plant
- c) Increased availability to plants of copper in soil, but decreased bioavailability of Cu in the animal
- d) Elevated sulphur concentrations of the proteins of the plants**

The sulphur level in a protein is constant and depends on the S-containing amino acids in the protein. Additional sulphur in soil won't change the composition of the protein in the plant.

a) b) c) The availability to plants of mineral elements in the soil is determined by the pH of the soil.

4. What is another name for vitamin B9?

- a) Amygdalin
- b) Folic acid**
- c) Biotin
- d) Betaine

Folic acid and biotin are classified as true vitamins. Amygdalin is the controversial vitamin B17, claimed to be a potent anti-cancer vitamin.

5. In ruminants the excretion of metabolic faecal nitrogen (MFN) is highly correlated with:

- a) Amount of protein taken in
- b) Level of rumen undegradable protein in the diet
- c) Amount of dry matter taken in**
- d) Level of total crude protein in diet

6. What is the approximate vitamin A concentration in green, well-fertilized grass? **0%**

Plants do not contain vitamin A, but only the precursor, beta-carotene.

A few years ago the British quiz programme "Who wants to be a millionaire?" listed four vegetables and wanted to know which one contains the higher level of vitamin A? Carrots was, according to them, the correct answer.

7. In protein containing ingredients, why is there a difference between the "fixed nitrogen-to-protein (N:P) conversion factor" (6.25) and "ingredient specific N:P conversion factors"?

6.25 assumes that the protein contains 16% nitrogen (100/16), while the proteins in many ingredients contain different percentages of nitrogen.

8. In poultry nutrition, what is the difference between feed conversion ratio and feed efficiency?

FCR = feed intake / performance (lower is better); FE = performance / feed intake (higher is better)

A few questions were prepared for the audience, though not asked because of lack of time

According to the book "Farmageddon", activists convinced a court in Europe to ban the practice of injecting dairy cows with the growth hormone (bSomatotrophin) in the EU because bST:

- a) Is a product developed through genetic modification
- b) Causes cows to produce more milk and are thus more prone to mastitis**
- c) Pushes up the growth hormone levels in milk
- d) Causing cows to grow taller, thus weakening their legs