The Journal of Agricultural Science

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Editorial

Cite this article: Wiseman J Senior Editor (Animals) (2018). Editorial: Digestibility and degradability in animal nutrition studies. *The Journal of Agricultural Science* **156**, 1161–1162. https://doi.org/10.1017/S0021859619000121

Editorial: Digestibility and degradability in animal nutrition studies

Julian Wiseman, Senior Editor (Animals)

There has been increasing misuse of terms and units for measurements of digestibility and degradability of dietary components and a number of papers have had to be referred back to authors for further clarification. Accordingly, it is felt that an explanatory note would be of value as guidance for future submissions. Please note the comments/calculations below.

1 **Apparent digestibility** of a dietary component (e.g. neutral detergent fibre) is the amount of a dietary component ingested that is not excreted in faeces. It is calculated using the following formula:

$$\frac{\text{Quantity ingested} - \text{quantity voided in faeces or excreta}}{\text{Quantity ingested}}$$

For example:

$$\frac{200\ \text{g ingested} - 50\ \text{g voided}}{200\ \text{g ingested}} = \text{digestibility coefficient of } 0{\cdot}75$$

Please note that there are no units as digestibility is a coefficient describing the proportion digested.

2 **Concentration of digestible component** in a feedstuff or diet is sometimes preferred, which is calculated using the following formula:

$$\text{Coefficient of digestibility} \times \text{content of dietary component.}$$

For example, from the digestibility described above:
If the total dietary concentration of the component was 100 g/kg, then

$$0{\cdot}75 \times 100\ \text{g/kg} = \text{Content of digestible component of } 75\ \text{g/kg}$$

Please note that the unit is g/kg and needs to be qualified further to confirm if this on a fresh weight or dry matter basis.

Please also note that the above points (1) and (2) apply also to any measurement of digestibility (e.g. ileal digestibility) and *in vitro* studies.

3 **A similar situation applies for degradability and content of degradable component in ruminant studies.**

Here the key papers are Orskov and McDonald (1979) and a subsequent paper by Sinclair *et al.* (1993). The latter used the following equation (derived from Orskov and MacDonald, 1979):

$$P = a + b(1 - e^{-ct})$$

where P is the cumulative amount degraded at time t; a is the readily soluble fraction; b is the potentially degradable fraction in the rumen; c is the rate constant for degradation of b and t is the time (h).

If a and b are in g/kg, then the amount degraded has to be in g/kg; however, the latter needs to be divided by 1000 to obtain degradability as a coefficient representing the proportion degraded.

Thus, the bottom line is that degradability of a dietary component needs to be expressed as a coefficient, whereas content of a degradable component needs to be expressed as g/kg; as

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before, this latter needs further qualification to confirm if data are on a fresh weight or dry matter basis.

Finally all the above data, either as coefficients or g/kg, should replace % that is commonly employed.

Acknowledgements. I am grateful to Prof Phil Garnsworthy (University of Nottingham, UK) and one of our Editorial Board members Prof Chris Reynolds (University of Reading, UK) for advice on this matter.

References

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https://doi.org/10.1017/S0021859619000121 Published online by Cambridge University Press