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An Abstract, placed at the beginning of the text, should briefly indicate the experiments described (including year and place, as appropriate), the main results (preferably including some numerical values) and the most important conclusions. It should not repeat the wording of the title. The Abstract must not exceed 250 words. Key words should be included at the end of the Abstract: please do not repeat words from the manuscript title.

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briefly relate the author's results to other work on the subject, summarize any implications and applications and give the author's conclusions. Footnotes should not be used. All abbreviations used should be fully explained at first mention. Papers should be written in the third person. The main document should have continuous line numbering throughout, to help the referees draw attention to specific sections of text. The main document must not contain anything that could identify the authors.

Required sections: All papers must include sections detailing Financial Support, Conflicts of Interest, and finally Ethical Standards. If you have nothing to declare under any of these headings, please write 'None' or 'Not applicable'. These sections should be placed between the end of the text and the Reference list.

Tables must be numbered consecutively in the order in which they are cited in the text. Numerical results should be displayed as means with their relevant standard errors and degrees of freedom. Normally a mean should be rounded to one-tenth of its standard error and the standard error given to one decimal place more than the mean. The title should fully describe the contents of the Table and explain any abbreviations used in it. We do not use letters to denote statistical significance: instead, you should use S.E.M. or S.E.D. as appropriate together with D.F., and *P* values can also be quoted. If footnotes are necessary, use superscript numbers to list them, in numerical order.

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Raymundo R, Asseng S, Cammarano D and Quiroz R (2014) Potato, sweet potato, and yam models for climate change: a review. *Field Crops Research* **166,** 173–185.

Agren GI and Bosatta E (1996) *Theoretical Ecosystem Ecology: Understanding Element Cycles*. Cambridge, UK:

Cambridge University Press.

Satter LD, Jung HG, Van Vuuren AM and Engels FM (1999) Challenges in the nutrition of high- producing ruminants. In Jung HG and Fahey GC (eds). *Nutritional Ecology of Herbivores, Proceedings of the Vth International Symposium on the Nutrition of Herbivores*, pp. 609–646. Savoy, Illinois, USA: American Society of Animal Science.

Scott RK and Jaggard KW (1993) Crop physiology and agronomy. In Cooke DA and Scott RK (eds). *The Sugar Beet Crop: Science into Practice*, pp. 179–237. London: Chapman & Hall.

Johansson E (1995) *Wheat grain proteins: accumulation and composition in breeding for improved bread-making quality*. PhD thesis, The Swedish University of Agricultural Sciences, Svalöv, Sweden.

Jarvis S (1994) Soils and the environment. In *Institute of Grassland and Environmental Research 1993 Annual Report*, pp. 69–76. Aberystwyth: AFRC Institute of Grassland and Environmental Research.

Ferris CP, Gordon FJ, Patterson DC, Mayne CS and Kilpatrick DJ (in press) The influence of dairy cow genetic merit on the direct and residual response to level of concentrate supplementation. *Journal of Agricultural Science, Cambridge.*

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Numerals before units, including time, e.g. 3 ha, 5 kg, 30 s (seconds), 20 min, 4 h, 8 days, 6 weeks, 3 months, 2 years.

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Avoid confusion with consecutive figures by spelling out the first, e.g. two 3-year-old cows. For ratios use a colon, e.g. 17:24, not a solidus.

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NB. Give cation exchange capacity in mmol (+)/kg *not* mequiv. Please use g/kg, mg/kg, mg/l, µm/g, ml/l, etc. rather than % or p.p.m. Use kg/ha, or t/ha if more than 999 kg/ha, *not* quintals.

For international units, use SI units where possible, although we do allow the use of litre and millilitre.

Rates should be expressed by a solidus, e.g. kg/ha, 6 kg N/ha, 3 plants/m² (not 3 plants m²), 7 kg/ha per year.

Do not repeat units in lists, e.g. 3, 10, 17 and 30 °C; 20 or 30 % more. Use % after numbers, not per cent, e.g. 7 %.

Abbreviations. *All* abbreviations must be explained at first mention in the text (and should not be used in the title), e.g. leaf area index (LAI), dry matter (DM), artificial insemination (AI), acid detergent fibre (ADF).

Use full stops after words cut off short of their end, e.g. Fig., Ed. Do not use stops where the last letter of the abbreviation is that of the complete word, e.g. Figs, Expt, Expts, Eqn, Eqns, Eds. At the beginning of a sentence, write in full.

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Spelling and Style. Follow *the Concise Oxford Dictionary* and, for scientific terms, the *CAB Thesaurus*, Wallingford: CAB International.

NB. Use –ize, ization endings, e.g. minimize, organization, except for words whose noun ends in -is e.g. analyse, synthesised. Use (e.g.) connection not connexion.

Please try to avoid using the following words: level (use content, concentration, rate; or just omit) elevated (to mean increased), presently (to mean currently or at present) parameter (to mean variable, trait, character) population (to mean population density) densities (to mean population density).

References. For full details, see *Instructions to Authors* page.

Papers accepted by a journal but not yet published should be given in the text as Ferris *et al.* (in press) or (Ferris *et al.*, in press) and in the reference list as

Ferris CP, Gordon FJ, Patterson DC, Mayne CS and Kilpatrick DJ (in press). The influence of dairy cow genetic merit on the direct and residual response to level of concentrate supplementation. *Journal of Agricultural Science, Cambridge.*

If, by the proof stage, the publication details are still not known, cite in the text as (CP Ferris *et al.*, unpublished) and delete from the reference list. Otherwise, give date, volume and page numbers.

Statistical Note for Authors

The *Journal of Agricultural Science* has a tradition of setting high standards regarding the statistical methods contained in its papers and authors are strongly encouraged to involve a statistician at an early stage in the design and analysis of their studies. Although it is impracticable to present here a comprehensive survey of acceptable statistical analyses, it is nevertheless useful to point out some common practices which have and have not found favour with the editors. In order to speed up assessment of submitted papers, authors are advised to pay particular attention to the following.

(1) The description of the experimental designs and statistical analyses should be clear and concise. From this description, readers must be able to understand exactly how the experiment was conducted and how the data were analysed. Enough detail must be provided so that the randomization layout, blocking units, if any, and experimental units can be clearly identified. The model used for analysis must match the randomization structure of the experiment. When presenting initial numerical summaries of the experimental material (e.g. starting weights, ages) variation should be represented by ranges or standard deviations.

(2) The favoured method of presenting experimental results is by quoting estimated values of the relevant statistics (mean values, regression coefficients, etc.), together with the appropriate standard errors of those estimates. The degrees of freedom (D.F.) on which the standard errors (S.E.) are based should also be quoted. This will usually assist the referees and the general reader in understanding the experimental procedure.

(3) Authors should make every effort to ensure that the standard errors which are quoted are suitable for the comparisons which they wish to make. Unwarranted pooling of heterogeneous sources of variation (such as 'between' and 'within' animal) is particularly prevalent. When in doubt, authors should seek the guidance of a statistician.

(4) Repeated measurements over time or spatial data from, for example, crop disease or competition studies often give rise to correlated data that require special methods of analysis. Usually, it will be necessary to seek specialist advice before attempting an analysis of data of this type. A standard reference book is **Diggle PJ, Liang K-Y and Zeger SL** (1994) *The Analysis of Longitudinal Data.* Oxford, UK: OUP.

(5) The Journal will not publish tables containing a proliferation of asterisks or other indicators of statistical significance. Although statistically appropriate tests of hypotheses are acceptable, they should be employed sparingly and with discretion. Probability values may be quoted in the text: they should be presented to P = 0.xxx (note three decimal places). If P is >0.050 but <0.100 then, with presenting P = 0.xxx, the journal would accept that the response demonstrates a trend. Effect sizes and confidence intervals may be reported where appropriate. A good reference on *P* values and their use is **Greenland S, Senn SJ, Rothman KJ, Carlin JB, Poole C, Goodman SN and Altman DG** (2016) Statistical tests, P values, confidence intervals, and power: a guide to misinterpretations. *European Journal of Epidemiology* **31,** 337-350.

(6) Standard statistical models should be fully described using correct terminology so that the reader can understand the techniques that were used to model the data. Normally, this will involve some discussion of the data and some explanation of the choice of statistical model used.

(7) The uncritical and indiscriminate use of 'multiple comparison' procedures, particularly when the treatment structure provides a logical basis for testing, is inappropriate. The results of exhaustive, retrospective tests of hypotheses are not acceptable. The use of multiple range tests and superscripts/letters in Tables/Figures is unnecessary and unhelpful where quantitative treatment factors are involved, as described in **Riley J** (2001) Presentation of statistical analyses. *Experimental Agriculture* **37**, 115-123 (specifically page 118). See point 11 for further guidance. However, in factorial experiments with qualitative treatment factors (A and B, say) it is sensible to compare marginal means for A and B when interaction is deemed to be absent, and to compare A*B means by levels of A and by levels of B in case interactions are deemed present. If the experiment has a single qualitative treatment factor with a modest number of levels, multiple comparison procedures are also useful. In these cases, the use of superscript letters is acceptable. A good reference on this topic is **Bretz F, Hothorn T and Westfall P** (2010) *Multiple Comparisons using R*. Boca Raton, FL, USA: CRC Press. Authors must consider these comments carefully before submitting papers using asterisks/superscripts to separate treatments.

(8) Authors should aim to combine the virtues of simplicity and statistical rigour in the analysis of their data. Unnecessarily complex statistical methodology should be avoided. Where more sophisticated procedures are essential, great care needs to be taken in describing the method, and adequate references should be cited.

(9) The Journal will not normally publish routine Analysis of Variance tables used for calculating standard errors and significance tests. The underlying Analysis of Variance tables should be shown only if components of variance are of especial interest or if an unavoidably complex design has been used.

(10) Where a statistical package is used for analysis or modelling of data, it will normally be necessary to give an explicit reference to the package, version number and the techniques used with appropriate page numbers from the Reference Manual. With editorial agreement, novel computer code may be listed in an appendix.

(11) Where a treatment factor has several well defined quantitative levels such as, for example, rates of a fertilizer or rates of irrigation, we would normally expect to see a quantitative level model such as a polynomial response function model fitted to the effects of that factor. The fitted model describes the overall response to the treatments and the individual treatment responses will not normally be presented or discussed. Often a study will include a factorial combination of two or more factors which may include combinations of both quantitative and qualitative level factors. In that case, a full factorial analysis of variance may be needed. A good reference book covering this topic is **Welham SJ, Gezan SA, Clark SJ and Mead A** (2015). *Statistical Methods in Biology*. Boca Raton,

FL, USA: CRC Press.

(12) Statistical models with factorial structure must normally conform to the principle that factorial interaction effects of a given order should not be included unless all lower order effects and main effects contained within those interaction effects are also included. Similarly, models with polynomial factor effects of a given degree should normally include all corresponding polynomial factor effects of a lower degree (e.g. a factor with a quadratic effect should also have a linear effect). Useful references include:

Nelder JA (1994) The statistics of linear models: back to basics. *Statistics and Computing* **4**, 221-234.

Box GEP and Draper NR (2007) *Response Surfaces, Mixtures, and Ridge Analyses.* New York, USA: John Wiley & Sons.

Piepho HP and Edmondson RN (2018). A tutorial on the statistical analysis of factorial experiments with qualitative and quantitative treatment factor levels. *Journal of Agronomy and Crop Science* **204,** 429-455. DOI: 10.1111/jac.12267. Available online at https://onlinelibrary.wiley.com/doi/full/10.1111/jac.12267 (open access).