

## INSTRUCTIONS FOR AUTHORS

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*animal* – The international journal of animal biosciences is a Gold Open Access peer-reviewed journal, published monthly in English online (12 issues making a volume). Special issues or supplements may also be produced upon agreement with the Editorial Board.

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## BEFORE YOU START

### Scope

The scope of the journal, the expected standards of published articles, the article types published by *animal*, ethics, the authorship policy, the pre-print policy, plagiarism falsification fabrication and the handling of misconducts, the licences to publish and the article processing charge, the evaluation procedures and peer-review criteria, procedures for complaints and appeals, proofs and information on publication of the manuscript are presented in the Publication policies available at <https://animal-journal.eu/instructions-and-policies/>

Submitted manuscripts should not have been published previously, except in a limited form (e.g. abstract or short communication to a symposium or part of MSc or PhD theses) and should not be under consideration for publication by another journal. Book reviews are not accepted. Deposition of pre-prints should be declared at submission.

### Authorship and Ethics

- Authorship complies with the authorship and other ethics policies described in the Publication policies.
- Research described in the manuscript complies with ethical guidelines available on the website <https://animal-journal.eu/instructions-and-policies/>
- Authors have obtained permission to use copyrighted material in the manuscript prior to submission.

### Length recommendations for different types of article

Research and review articles may deviate from the guidelines provided below if justified by the research. Contact [editorialoffice@animal-journal.eu](mailto:editorialoffice@animal-journal.eu) for enquiries. Short communications, opinion papers and letters to the editor should comply with recommendations.

**Table 1** Recommendations for the articles published in *animal*

Article type	Maximum length (all text except figures)	Maximum number of tables plus figures	Maximum number of references	Additional information
Research article	7 500 words (= 9 journal pages)	8	35	
Short communication	3 000 words	3	10	
Review article	10 000 words (= 12 journal pages)	10	50	
Opinion paper	1 700 words (= 2 journal pages) or 1 200 if a figure is submitted	1	5	
Letter to the Editor	1 500 words	1		
All article types			5 references per 1000 words	Supplementary material can be proposed and will be made available online

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## Style sheet and pre-submission checklist

When preparing their manuscript authors are advised to use the journal's style sheet (<https://animal-journal.eu/instructions-and-policies/>), and to self-evaluate their manuscript before submission using the Pre-submission Checklist (<https://animal-journal.eu/instructions-and-policies/>). The checklist is provided as a service to authors to aid them getting their manuscript ready for peer-review.

## Initial screening

At submission, manuscripts are viewed by the Editorial Office, the Editor-in-Chief and/or a member of the Editorial Board for compliance with scope, standards and presentation of the manuscript. If the manuscript is incomplete or the quality of the manuscript is insufficient for peer-review, it will be returned to authors for improvements before being assigned to an Editor. If the submission is out of scope or not up to standards, it will be removed by the Editor-in-Chief and no longer considered. If the submission is unsuitable for *animal* but better fits another journal from the *animal* family of journals, authors will be offered to transfer their submission to another journal. Any deviations from instructions will be at the discretion of the Editor-in-Chief. Note that the quality of the manuscript is under the responsibility of authors. A good quality is expected to facilitate peer-review and ensure that manuscripts are peer reviewed exclusively on academic merit.

## WRITING YOUR PAPER – ABOUT CONTENTS

### Your paper is understandable

#### Scientific writing

**i** A good quality of scientific writing is required. The research must be understandable by the general scientific readership of *animal* and by specialists.

The take-home message is clearly identified and the structure of the whole text is efficient. The context is briefly presented, the research problem is identified, the existing knowledge relevant to the problem is critically analysed, and the research hypothesis is clear. The reporting is complete. Arguments and evidence are presented in a well organised, clear, logical and balanced way from the most general to the specific point. Discussion connects all results obtained in an organised and proper way with a clear interpretation. Sentences are simple, short and direct, the style is concise yet informative and precise.

#### English

**i** A good quality of written English (syntax, spelling, grammar) is required to facilitate the peer-review process.

Spelling may be in British or American English, but must be consistent throughout the paper. Care should be exercised in the use of agricultural terminology that is ill-defined or of local familiarity. If the English is not good enough, the manuscript will be sent back to the authors with a recommendation that authors have their manuscripts checked by an English language native speaker before re-submission. Elsevier lists third-party services specialising in language editing and / or translation at <http://webshop.elsevier.com/languageediting/> and suggests that authors contact them as appropriate. Use of any of these services is at the author's own expense.

#### Presentation

**i** Poor presentation may hamper the understandability of the paper.

The responsibility for the preparation of a paper in a form suitable for a good understanding of the research lies with the author. Authors should follow the Instructions for Authors (see [Presenting your paper](#)) and consult recent articles of *animal*, available at <https://www.journals.elsevier.com/animal/>, to make themselves familiar with the layout and style of *animal*.

- The format of (sub-) headings is in accordance with recommendations in order to clarify the structure of the text, especially in the Material and methods section.
- Tables are clearly presented. Treatments are in columns and variables are in lines, as relevant.

### Your paper is complete

#### Main text - Required sections and order

**i** All sections are present. A style sheet is available for use on our website at <https://animal-journal.eu/instructions-and-policies/>.

Full title, Authors, Authors' affiliations including department and post/zip codes, Corresponding author, Abstract, Keywords, Implications, Introduction, Material and methods, Results, Discussion, Ethics

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approval, Data and model availability statement, Author ORCID, Author contributions, Declaration of interest, Acknowledgements, Financial support statement, References, Tables, List of figure captions.

For review articles, opinion papers and letters to the editor, the sections Abstract, Keywords, Implications, Material and methods, Results, Discussion are not required. For letters to the editor, Authors and Affiliations are positioned at the end of the letter.

### Figures

Figures are submitted as relevant.

### Supplementary Materials

Supplementary Materials are submitted as relevant.

As from the 1<sup>st</sup> of January 2023, *animal* will not accept raw data in Supplementary Materials anymore. Raw data should be published in an Open Access institutional or public data repository, *animal* accepts any official data repository listed in the registry of research data repositories (<https://www.re3data.org/>). A link to the repository should be provided in the article under the section ‘Data and model availability statement’.

## Each section of your main text provides the required information

### Full title

**i** The title provides sufficient information to allow the reader to judge the relevance of a paper to his/her interests.

- Concise and informative; no more than 170 characters including spaces.
- Include the animal species on which the study has been carried out.
- Exclude the name of the country or of the region where the study took place.
- Exclude Latin names, if there is a common name.
- Exclude non-standard abbreviations. Follow the link to find [the standard abbreviations](#).
- The title of companion manuscripts should reflect it with a Part 1 and a Part 2.
- Title of a review article should start with "Review:" or "Animal board invited review:" as relevant.
- Title of an opinion paper should start with "Opinion paper:".
- Title of a short communication should start with "Short communication:".
- Title of a letter to the editor should start with ‘Letter to the Editor:’. Title of a response to a letter to the editor should start with ‘Response to the Letter to the Editor:’.

### Authors and affiliations

**i** Information, such as author names and affiliations should be presented as below.

#### Example

J. Smith<sup>a,1</sup>, P.E. Jones<sup>b</sup>, J.M. Garcia<sup>a,c</sup>, P.K. Martin Jr<sup>d</sup> [initials only for first names]

<sup>a</sup>Department of Animal Nutrition, Scottish Agricultural College, West Main Road, Edinburgh EH9 3JG, UK

<sup>b</sup>Animal Science Department, North Carolina State University, Raleigh, NC 27695-7621, USA

<sup>c</sup>Laboratorio de Producción Animal, Facultad de Veterinaria, Universidad de Zaragoza, C. Miguel Servet, 177, 50013, Zaragoza, Spain

<sup>d</sup>Dairy Science Department, North Carolina State University, Raleigh, NC 27695-7621, USA

<sup>1</sup>Present address: Dairy Science Laboratory, AgResearch, Private Bag 11008, Palmerston North, New Zealand (for any author of the list whose present address differs from that at which the work was done)

Corresponding author: John Smith. E-mail: [John.Smith@univ.co.uk](mailto:John.Smith@univ.co.uk).

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- Only one corresponding author is indicated in the manuscript.
- The corresponding author who submits and manages the manuscript during the submission/peer-review process must be registered on Editorial Manager. He or she can be different from the corresponding author indicated in the manuscript who will be the correspondent for the published paper.

### *Abstract (max 400 words, single paragraph)*

**i** *The abstract should be complete and understandable, without reference to the paper. It follows the same structure as the text.*

- The context and the rationale of the study are presented succinctly to support the objectives. Experimental methods and main results are summarised but should not be overburdened by numerical values or probability values. The abstract ends with a short and clear conclusion.
- Citations and references to tables and figures are not acceptable.
- Abbreviations should be used sparingly and must be defined in the abstract.
- The whole abstract is written as a single paragraph.

### *Keywords (5 keywords)*

**i** *Keywords are essential in information retrieval and should not repeat words in the title with respect to indicating the subject of the paper.*

- Five keywords (no more, no less).
- Keywords should be different from words in the title.
- Keywords should be short and specific.
- The animal species or type can be among the keywords but differently from the title.
- The use of non-standard abbreviations in the list of keywords is not allowed. Follow the link to find [the standard abbreviations](#).

### *Implications (max 100 words)*

**i** *Implications must explain the expected impact that the results may have on practice, when they will be applied. Impact may be economic, environmental or social.*

- The Implications section should answer the questions ‘What did you learn?’, ‘Who may benefit from your results and how?’
- The Implications section should stand alone, be clear to non-specialists while being precise enough for specialists.
- After a brief description of the context and the scientific question, highlight your main findings, and describe the potential applications of your own results and their field of application for the livestock industry.
- Be careful not to oversell your results.
- Write in simple English suitable for non-specialists or even non-science readers.
- Do not use any non-standard abbreviations.

### *Highlights*

**i** *Note that prior to acceptance of your article, you will be asked to use the Implications section as the basis to write the Highlights of your paper. While the Implications section is included in the published article and is written as a single paragraph in a continuous manner, Highlights are used to increase the discoverability of your article via search engines, and will be published in the HTML version of your article only.*

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- Highlights are a collection of 5 bullet points (maximum 85 characters, including spaces, per bullet point) that convey the core messages of your article.
- When you prepare your Highlights upon request by the Editorial Office, we recommend that the bullet points include 1) a presentation of the research question, 2) your main results, and 3) the potential applications of your own results and their field of application for the livestock industry.
- Do not use any non-standard abbreviations.
- Highlights will be submitted in a separate file in the online submission system as instructed by Editorial Office.

### Introduction

**i** The introduction briefly outlines the context of the work, presents the rationale of the scientific issue, and clearly defines the objectives.

- The context is only briefly described. The scientific question is developed and supported by the critical analysis of published work.
- For hypothesis-driven research (Sections 1 to 3), the hypothesis under test should be clearly stated.
- Scarcity of studies is not sufficient to justify research. Increasing the knowledge on a subject is not an objective *per se*.
- If the implementation of the research results in practice could contravene health, animal wellbeing and environmental standards in countries other than where the work was undertaken, then authors should consider how this will impact on the international relevance of the research.
- If the manuscript is companion to another submission, the introduction presents the links between manuscripts.
- If preliminary results have been published in an abstract form, it is indicated at the end of the introduction.

### Material and methods

**i** Material and methods should be described in sufficient detail so that others can reproduce the experiment. References to previously published work may be used to give details of methods, provided that references are readily accessible and in English.

- **Reporting.** Material and methods are reported according to "The ARRIVE Guidelines for Reporting Animal Research" detailed in Kilkenny *et al.* (2010)<sup>1</sup> and summarised at [www.nc3rs.org.uk](http://www.nc3rs.org.uk).
- **Experimental design.** When relevant, the experimental design should be presented in a separate sub-section at the beginning of the "Material and methods" section. It explains and justifies the structure of the experimental units (e.g. individual animal, group/pen of animals) and how the controlled experimental factors were organised in treatments to test the hypothesis or answer the specific questions under study. The known and expected sources of variability in experimental units are identified to address replication, blocking or randomization. A power analysis of the experimental design is recommended. Distinction between quantitative and qualitative factors, use of control treatments are presented.
- **Description of critical methods.** For the sake of reproducibility, the methods that are most important for the conclusions of the study, including mathematical equations, must be described in detail. They can be presented in the Supplementary Materials as necessary.
- **Validation and Quality Assurance.** Validation is defined as a comparison of the research predictions with the real world to determine whether the results of the research are suitable for their intended purpose. Validation highlights the strengths and the limits of the results obtained,

<sup>1</sup> Kilkenny, C., Browne, W.J., Cuthill, I.C., Emerson, M., Altman, D.G., 2010. Improving bioscience research reporting: The ARRIVE guidelines for reporting animal research. *PLoS Biology* 8, e1000412. doi: 10.1371/journal.pbio.1000412.

and their applicability. A wide range of validation techniques can be applied, including: comparison with reference measurements (e.g. recovery rates for markers or gaz exchange measurements), robustness of measurements (e.g. intra- and inter-observer reliabilities for observational measurements), statistical tests (e.g. regression analysis of observed vs. predicted data), deviance measures (e.g. Mean Absolute Error, Root Mean Squared Error), visual techniques (e.g. plot of observed vs. predicted data), subjective assessment (e.g. evaluation by experts). For laboratory methods, results of Quality Assurance tests or method validation procedures refer to performance of assays (e.g. intra/inter-assay CV, reportable range, specificity, normalisation...). Validation and/or Assurance quality procedure and output, must be reported for the methods that are most important for the conclusions of the study in the Material and methods or as Supplementary materials. Alternatively they must be addressed in the Discussion section.

- **Statistical analysis of results.** The statistical analysis of results should be presented in a separate sub-section at the end of the "Material and methods" section. The software used and the models of statistical analysis must be described, as well as each of the statistical methods used. Sufficient statistical details must be given to allow replication of the statistical analysis. Generally, and when there are more than 2 treatments, an analysis of variance with F-tests is preferred to multiple *t*-tests. A statistical guide for authors is available on the website at <https://animal-journal.eu/animal-journal/instructions-and-policies/>. The publication of Lang and Altman (2013)<sup>2</sup> can also be used as a reference. We also recommend you include the code for the statistical model, as programmed in the relevant software, in the Supplementary materials.
- **Proprietary product.** If a proprietary product is used as a source of material in experimental comparisons, it should be described using the appropriate chemical name. If the trade name is helpful to the readers, provide it in parentheses after the first mention.

### Results - Discussion

**i** Separation between Results and Discussion is preferred to highlight the interpretation of results.

- Presentation of Results and Discussion in a single section is possible but discouraged.
- If the implementation of the research results in practice could contravene health, animal wellbeing and environmental standards in countries other than where the work was undertaken, then authors should consider how this will impact on the international relevance of the research.
- A short conclusion appears at the end of the text and is merged in a single paragraph.

### Ethics approval

**i** Where research involves animal experimentation, authors should assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on animal experimentation. This section is mandatory in all article types.

- When relevant, the full reference/number of the committee approval should be provided.
- Due consideration of the 3Rs (Refinement, Reduction, Replacement) is expected.
- When the study did not require approval by an institutional committee, include the following statement: 'Not applicable'.

### Data and model availability statement

**i** Authors must indicate whether their data, the model or the software developed as an outcome of the study are deposited in an official repository (recommended). Access rights should also be specified. This section is mandatory in all article types.

<sup>2</sup> Lang, T., Altman, D., 2013. Basic statistical reporting for articles published in clinical medical journals: the SAMPL guidelines. In Science editors' handbook (ed. Smart, P., Maisonneuve, H., Polderman, A.). European Association of Science Editors, Exeter, UK, pp. 175-182. This document may be reprinted without charge but must include the original citation.



- *animal* recommends that data, models or software are deposited in an official repository listed in the registry of research data repositories (<https://www.re3data.org/>). If this is the case, provide the full reference and the full link starting by 'https://'.
- If not applicable, you can use one of the following statements as appropriate: 'None of the data were deposited in an official repository.' or 'The model was not deposited in an official repository.'
- Whether deposited or not, always indicate the access rights to data, software or model (available to reviewers, available upon request, public, confidential...).
- Do not indicate the software that were used in the study, they belong to the Material and methods section.

### Author ORCID*s*

**i** This section is mandatory in all article types and the corresponding author must provide his/her ORCID number.

- All co-authors are encouraged to indicate their ORCID number.

### Author contributions

**i** The contribution of each co-author should be explained: conception or design of the work, acquisition, analysis and interpretation of data, drafting and critically revising the manuscript. This section is mandatory in all article types. Note that contribution does not necessarily justify authorship.

- Author contributions should be described according to the CRediT taxonomy.
- They have to be formatted by the author's name followed by the relevant credit role(s). More details and a sample CRediT author statement is available at <https://www.elsevier.com/authors/journal-authors/policies-and-ethics/credit-author-statement>.
- Note that each author must first comply with the authorship policy of the journal '*All co-authors substantially contributed to the conception or design of the work; or the acquisition, analysis or interpretation of data for the work AND drafted or critically revised the work for important intellectual content AND approved the final version to be published AND agreed to be accountable for all aspects of the work.*'

### Declaration of interest

**i** Please provide details of all known financial, professional and personal relationships with the potential to bias the work. This section is mandatory in all article types.

- Where no known conflicts of interest exist, include the following statement: "None."

### Acknowledgements

**i** In this section, the authors may briefly acknowledge individuals or organisations that provided advice, their credits to companies, preliminary publications of the research, etc. This section is mandatory in all article types.

- Individuals who contributed to the article but do not meet the full criteria for authorship should be acknowledged here.
- If the research was conducted as part of a thesis, it should be acknowledged here, and the full reference should be provided.
- If the article was deposited as a pre-print in a pre-print repository, it should be acknowledged here, and the full reference should be provided.
- If there are no acknowledgements, include the following statement: 'None.'

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### Financial support statement

**i** Please provide details of the sources of financial support for all authors, including grant numbers. This section is mandatory in all article types.

- Example of statement: ‘This work was supported by the European Commission (grant number XXXXXX)’.
- Grants held by different co-authors should be identified according to individual authors by the author’s initials.
- When no specific funding has been provided, you may use the following statement: ‘This research received no specific grant from any funding agency, commercial or not-for-profit section’.

### References

**i** References from international refereed journals or from national refereed journals with at least an English abstract are preferred.

- References from non-peer-reviewed articles or from national abstracts/conference proceedings, MSc or PhD thesis, institutional/technical reports, documents that cannot be obtained easily by the reader should be minimized.
- If a submitted manuscript has previously been published in a limited form (e.g. abstract or short communication to a symposium or part of MSc or PhD theses), the previous publication form should be cited and the full reference should be provided.
- In general, no more than 3 references can be given for the same statement (except for reviews and meta-analyses).
- The list of references used in a meta-analysis should be presented in Supplementary materials.

### Tables

**i** Tables should be explicit while concise and should not include details on materials and methods in the captions or footnotes. The reporting of statistical results complies with simple basic rules.

- Tables are recommended when exact numerical values are important or may be re-used later in meta-analysis. The same material should not be presented in tabular or graphical form.
- The animal species and the experimental treatments (or the issue) under study are indicated in each caption.
- When data are analysed by analysis of variance *animal* requests that a residual error term such as the pooled standard error, the residual standard deviation (RSD), or the root mean square error (RMSE) is reported in tables and not SE/SD for each treatment. Indeed, anovas are based on the hypothesis of homogeneous variance among treatment groups.
- Probabilities are given as numerical values and not as “NS” when considered not significant.
- The number of decimals of *P* values for means and/or the error term should be homogenized or should follow a systematic rule.
- The number of “decimal places” is different from the number of “significant figures”. This is especially important when reporting coefficients in equations. In the equation  $Y=a+bX+cX^2$ , the number of meaningful decimal places depends on the value of *X*.

### Figures

**i** Figures should be explicit while concise and should not include details on materials and methods in the captions or footnotes.

- Figures are recommended to illustrate trends. The same material should not be presented in tabular or graphical form.

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- The animal species and the experimental treatments (or the issue) under study are indicated in each caption.

## Complying with Image Integrity and Standards

### *Image Integrity and Standards*

**i** Any image produced by an instrument (e.g. scanner, microscopy) with the objective of being used to derive quantitative results is considered as original data. Manuscripts that report images without any quantitative findings are not acceptable. Digitalisation of an image converts the image into numerical values that can be analysed like any other numerical values. The full information may prove important beyond what the author would like to show. Hence images submitted with a manuscript should be minimally processed; some image processing is acceptable (and may be unavoidable), but the final image must accurately represent the original data and exclude any misinterpretation of the information present in the original image. If original data are used just to illustrate a point, this should be accompanied by a clear statement in the manuscript telling the reader this and explaining what is being demonstrated. Please refer to the [Office of Research Integrity guidelines](#) on image processing in scientific publication.

- Image acquisition: Equipment and conditions of image acquisition and processing must be detailed in the Material and methods section. This includes the make and model of equipment, the acquisition and the image processing software, and the image treatment if any. If you export files from an acquisition device, make sure to use a format with no loss of information and do not file them into a higher resolution than that of acquisition. Authors have the responsibility to archive original images, with their metadata, in their original format without any compression or compressed without loss of information.
- Preparation of images for a manuscript: For guidance, we refer to the Journal of Cell Biology's instructions to authors ([http://jcb.rupress.org/site/misc/ifora.xhtml#image\\_aquisition](http://jcb.rupress.org/site/misc/ifora.xhtml#image_aquisition)) which states:
  - 1) No specific feature within an image may be enhanced, obscured, moved, removed, or introduced.
  - 2) The grouping of images from different parts of the same gel, or from different gels, fields, or exposures must be made explicit by the arrangement of the figure (i.e., using dividing lines) and in the text of the figure legend.
  - 3) Adjustments of brightness, contrast, or colour balance are acceptable if they are applied to every pixel in the image and as long as they do not obscure, eliminate, or misrepresent any information present in the original, including backgrounds. Non-linear adjustments (e.g., changes to gamma settings) must be disclosed in the figure legend.

For further information, image examples, and more detailed guidance, we advise reading [What's in a picture? The temptation of image manipulation](#) (reprinted in the *Journal of Cell Biology* (2004) 166, 11-15).

- If a cropped image is included in the main text of a paper (e.g. a few lanes of a gel), display the full original image, including the appropriate controls, the molecular size ladder and/or the scale as relevant, as a single figure in a Supplementary Material file to facilitate peer-review and for subsequent on-line publication.
- The statistical analysis applied to the quantitative data associated with images must clearly define the statistical unit considered (e.g. the animal, the sample).
- Image screening at submission: Digital images from submissions will be screened for any evidence of improper manipulation or quality. If the original images cannot be supplied by authors on request, the journal reserves the right to reject the submission or to withdraw the published paper.

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## Supplementary material

**i** *Authors can include supplementary material in any type of article. It will be peer-reviewed along with the rest of the manuscript. Raw data should not be included in Supplementary Material anymore.*

- Detailed description of critical methodologies and procedures and results of validation and Quality Assurance should be reported in Supplementary materials if not included in the Material and methods section.
- The main text of the article must stand alone without the supplementary material.
- A link to this online supplementary material will be included by the Copy Editor at the proof stage.
- The title of the article, the list of authors, their affiliations and the journal name are included at the top of the supplementary materials.

## PRESENTING YOUR PAPER – ABOUT FORMAT

Authors should consult recent articles of *animal*, available at <https://www.journals.elsevier.com/animal>, to make themselves familiar with the layout and style of *animal*.

A **style sheet** summarising the below indications is available on our website at <https://animal-journal.eu/instructions-and-policies/>. We recommend that you use it to insert your text.

### General presentation

#### Manuscript layout

**i** Manuscripts should be prepared using a standard word processing programme such as Microsoft Word, and presented in a clear, readable format with easily identified sections and headings.

- Typed with double-line spacing with wide margins (2.5 cm)
- Lines must be continuously numbered; the pages must also be numbered
- Arial 12 should be used for the text, and Arial 11 for tables and references
- Use of small paragraphs with less than 6 to 8 lines must be avoided
- Footnotes in the main text are not allowed

#### Title and headings

**i** The format of title and headings is in accordance with instructions in order to clarify the structure of the text.

- Title – use bold, with an initial capital for the first word only and for words that ordinarily take capitals.
- Authors' names – use lower case with initials in capitals (e.g. J. Doe).
- Authors' addresses – use italics.
- Headings are left aligned with an initial capital for the first word only, and are not numbered.
- Limit sections to three heading levels – **Heading 1**, **Heading 2**, **Heading 3**.

Examples:

**Material and methods**

**Experimental design**

The experiment was designed as...

**Analytical methods**

*Feed analyses*

Feeds were analysed...

*Milk fatty acid composition*

The composition of...

#### Abbreviations

**i** Standard abbreviations (Table 2) are not defined.

- Define non-standard abbreviations at first appearance in the abstract and in the main text
- Use a maximum of 10 non-standard abbreviations.
- No non-standard abbreviation in the title, Implications, (sub)headings or in keywords.
- Non-standard abbreviations used in tables and figures must be defined either as footnotes or in the caption (see Illustrations).
- Do not start a sentence with an abbreviation.

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**Table 2** Standard abbreviations that do not require definition

Item	Definition
Standard abbreviation	
ACTH	Adrenocorticotrophic hormone
ADF	Acid detergent fibre
ADL	Acid detergent lignin
ADP	Adenosine diphosphate
ANOVA	Analysis of variance
ATP	Adenosine triphosphate
BLUP	Best linear unbiased prediction
BW	Body weight
CoA	Coenzyme A
CP	Crude protein
DM	Dry matter
DNA	Deoxyribonucleic acid
ELISA	Enzyme-linked immunosorbent assay
FSH	Follicle-stimulating hormone
GLC	Gas-liquid chromatography
GLM	General Linear Model
HPLC	High performance (pressure) liquid chromatography
IGF	Insulin-like growth factor
IR	Infrared
LH	Luteinising hormone
MS	Mass spectrometry
n	Number of samples
NAD	Nicotinamide adenine dinucleotide
NADP	Nicotinamide adenine dinucleotide phosphate
NADPH <sub>2</sub>	Reduced nicotinamide adenine dinucleotide phosphate
NDF	Neutral detergent fibre
NIRS	Near infrared spectrophotometry
PAGE	Polyacrylamide gel electrophoresis
PCR	Polymerase chain reaction
PMSG	Pregnant mare serum gonadotropin
RNA	Ribonucleic acid
SDS	Sodium dodecyl sulfate
UV	Ultraviolet
Standard statistical abbreviation	
CV	coefficient of variation
df	degrees of freedom
EMS	expectation of mean square
F	variance ratio
LSD	least significant difference
MS	mean square
<i>P</i>	probability
<i>r</i>	simple correlation coefficient
<i>R</i>	multiple correlation coefficient
<i>R</i> <sup>2</sup>	coefficient of determination
RSD	residual standard deviation
RMSE	root mean square error
SD	standard deviation
SE	standard error
SED	standard error of difference
SEM	standard error of mean
<i>S</i> <sub><i>y</i>.<i>x</i></sub>	standard error of estimate
$\chi^2$	chi square

The names of the chemicals do not need to be written in full; chemical symbols are sufficient.

## Presentation of statistical results

**i** In the text and tables, presentation of statistical results follows simple rules.

- Treatment means are reported with meaningful decimals. The number of significant figures given should indicate the precision of the experiment. In practice, quote as significant all figures that are certain plus the first uncertain one.
- The SD / SE should be quoted to one place more than the mean (e.g., for a mean value of 15, SE should be reported as 1.2).
- In the text, the probability of significance is indicated either by the exact level of probability (e.g.  $P = 0.07$ ) or by the following conventional standard abbreviations:  $P < 0.05$ ,  $P < 0.01$  and  $P < 0.001$  for significance at these levels.
- In tables, when data are analysed by analysis of variance, a residual error term, is given for each criteria/item/variable/trait in a separate column.
- In tables, probabilities are indicated in a separate column. The numerical  $P$  values (e.g.  $P = 0.07$ ) are reported. In figures differences can be indicated by \*, \*\* and \*\*\*, which need to be defined in the figure legend or caption.
- In tables, differences between treatments (or comparison of mean values) are indicated using superscript letters, e.g. <sup>a,b</sup>.

## Numbers and units

**i** The format of numbers and units should be consistent.

### Numerals

- In the text, use words for numbers zero to nine (if not associated to a standard unit) and numerals for higher numbers. In a series of two or more numbers, use numerals throughout irrespective of their magnitude.
- Do not begin sentences with numerals.
- For values less than unity, 0 is inserted before the decimal point.
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- Division of one number by another should be indicated as follows: 136/273.
- Use numerals if a number is followed by a standard unit of measurement (e.g. 100 g, 6 days, 4th week).
- Use numerals for dates, page numbers, class designations, fractions, expressions of time, e.g. 1 January 2007; type 2.
- Dates are given with the month written in full and the day in numerals (i.e. 12 January *not* 12th January).
- For time use 24-h clock, e.g. 0905 h, 1320 h.

### Units of measurement

The International System of Units (SI) should be used. A list of units is found at <http://physics.nist.gov/cuu/Units/units.html>. Recommendations for conversions and nomenclature appeared in *Proceedings of the Nutrition Society* (1972) 31, 239-247. Some frequently used units that are not in the SI system are accepted: e.g. l for litre, ha for hectare, eV for electron-volt, Ci for curie. Day, week, month and year are not abbreviated. The international unit for energy (energy value of feeds, etc.) is Joule (or kJ or MJ).

- A product of two units should be represented as N·m and a quotient as N/m (e.g. g/kg and not  $\text{g}\cdot\text{kg}^{-1}$ ).
- When there are two quotients, represent as: g/kg per day (not g/kg/day).

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### Concentration or composition

Composition is expressed as mass per unit mass or mass per unit volume. The term *content* should not be used for concentration or proportion.

## Style

**i** The style should be consistent.

### Capitals

- Initial capitals are used for proper nouns, for adjectives formed from proper names, for generic names and for names of classes, orders and families.
- Names of diseases are not normally capitalised.

### Italics

Use italics for:

- Authors' addresses (see above).
- Subheadings (see above).
- Most foreign words, especially Latin words, e.g. *ad hoc*, *ad libitum*, *in situ*, *inter alia*, *inter se*, *in vitro*, *per se*, *post mortem*, *post partum*, *m. biceps femoris* but no italics for c.f., corpus luteum, e.g., etc., i.e., NB, via.
- Mathematical unknowns and constants.
- Symbols of genes or alleles e.g. *HbA*, *TfD*.

## References

**i** It is the author's responsibility to ensure that all references are cited and accurate.

- All sources must be cited in the text using the author-date system and must have an entry in the reference list.
- Names of organisations used as authors (e.g. Agricultural and Food Research Council) should be written in full in the list of references and on first mention in the text. Subsequent mentions may be abbreviated (e.g. AFRC).

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- For single authors, use Doe (2014) or (Doe, 2014).
- For two authors, use Doe and Smith (2014) or (Doe and Smith, 2014).
- For three or more authors, use Doe et al. (2014) or (Doe et al., 2014).
- When multiple references are cited, rank them preferably by chronological order using commas and semicolons: (Doe, 1999; Smith and Doe, 2001; Doe et al., 2014 and 2015; Wright et al., 2018a and 2018b).

### List of references

**i** In the reference list, references should be listed in alphabetical order by authors' names. Their formatting and style should be as detailed below. An Endnote reference style is available at <https://animal-journal.eu/animal-journal/instructions-and-policies/>

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### Authors' information and publication year

**i** Author, A., Author, B., Author, C.D., Author, E., Year.

- Include a comma after every family name and in-between different authors' names.
- Include a period after every initial.
- Commas before and full stops after publication years.
- Note that all authors must be listed.

### Publisher/Conference/University location

**i** Publisher, City, State (2-letter abbreviation) for US places, Country

Examples:

- AOCS Press, Champaign, IL, USA
- Cambridge University Press, Cambridge, UK
- International Organization for Standardization, Geneva, Switzerland
- FAO, Rome, Italy
- Louisiana State University, Baton Rouge, LA, USA
- Cambridge University, Cambridge, UK

### Journal article

**i** Author(s), Year. Article title. Full Name of the Journal Volume, first-last page numbers.

- Journal names are given in full, not in abbreviated form.
- Issue numbers are not required.

Examples:

- Martin, C., Morgavi, D.P., Doreau, M., 2010. Methane mitigation in ruminants: from microbe to the farm scale. *Animal* 4, 351-365.
- Berry, D.P., Wall, E., Pryce, J.E., 2014. Genetics and genomics of reproductive performance in dairy and beef cattle. *Animal* 8 (suppl. 1), 115–121.
- Knowles, T.G., Kestin, S.C., Haslam, S.M., Brown, S.N., Green, L.E., Butterworth, A., Pope, S.J., Pfeiffer, D., Nicol, C.J., 2008. Leg disorders in broiler chickens: prevalence, risk factors and prevention. *PLoS ONE* 3, e1545.
- Pérez-Enciso, M., Rincón, J.C., Legarra, A., 2015. Sequence- vs. chip-assisted genomic selection: accurate biological information is advised. *Genetics Selection Evolution* 47, 43. doi:10.1186/s12711-015-0117-5.
- When the article is online but not yet printed, the right format is:  
Zamaratskaia, G., Squires, E.J., 2008. Biochemical, nutritional and genetic effects on boar taint in entire male pigs. *Animal*, doi:10.1017/S1751731108003674, Published online by Cambridge University Press 17 December 2008.

### Book (or official report)

**i** Author(s)/Editor(s)/Institution, Year. Book title, volume number if more than 1, edition if applicable. Publisher's name, City, State (2-letter abbreviation) for US places, Country.

- If a publisher is based in more than one place, use only the first one.
- If multiple publishers are listed, it is acceptable to use only the first one.

Examples:

- Association of Official Analytical Chemists (AOAC), 2004. Official methods of analysis, volume 2, 18th edition. AOAC, Arlington, VA, USA.
- Littell, R.C., Milliken, G.A., Stroup, W.W., Wolfinger, R.D., 1996. SAS system for mixed models. Statistical Analysis Systems Institute Inc., Cary, NC, USA.
- Martin, P., Bateson, P., 2007. Measuring behaviour. Cambridge University Press, Cambridge, UK.
- National Research Council (NRC), 2012. Nutrient requirements of swine, 11th edition. National Academy Press, Washington, DC, USA.

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- Statistical Analysis Systems Institute, 2002. SAS user's guide, version 9.00. SAS Institute Inc., Cary, NC, USA.

### *Book chapter (or part of an official report)*

**i** Author(s), Year. Chapter title. In Title of book (ed. Editor, A., Editor, B.). Publisher's name, City, State (2-letter abbreviation) for US places, Country, pp. first-last page numbers.

- If a publisher is based in more than one place, use only the first one.
- If multiple publishers are listed, it is acceptable to use only the first one.

Example:

- Nozière, P., Hoch, T., 2006. Modelling fluxes of volatile fatty acids from rumen to portal blood. In Nutrient digestion and utilization in farm animals (ed. Kebreab, E., Dijkstra, J., Bannink, A., Gerrits, W.J.J., France, J.). CABI Publishing, Wallingford, UK, pp. 40–47.

### *Proceedings (or Conference papers)*

**i** Author(s), Year. Paper title. Proceedings of the (Book of abstracts or Paper presented at the) XXth Conference title, date of the conference, location of the conference, pp. first-last page numbers or poster/article number.

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- Note – If proceedings are published in a journal, the article should be formatted as for a journal article. If they have been published as chapters in a book, the article should be formatted as for a chapter in a book.

Examples:

- Bispo, E., Franco, D., Monserrat, L., González, L., Pérez, N., Moreno, T., 2007. Economic considerations of cull dairy cows fattened for a special market. Proceedings of the 53rd International Congress of Meat Science and Technology, 5-10 August 2007, Beijing, China, pp. 581–582.
- Vautier, B., Quiniou, N., Van Milgen, J., Brossard, L., 2013. Accounting for variation among individual pigs in deterministic growth models. Book of abstracts of the 64th annual meeting of the European Federation of Animal Science, 26-30 August 2013, Nantes, France, p. 391.
- Martuzzi, F., Summer, A., Malacarne, M., Mariani, P., 2001. Main protein fractions and fatty acids composition of mare milk: some nutritional remarks with reference to woman and cow milk. Paper presented at the 52nd Annual Meeting of the European Association for Animal Production, 26-29 August 2001, Budapest, Hungary.

### *Website*

**i** Author(s)/Institution, Year. Document/Page title. Retrieved on DD Month YYYY (i.e. accessed date) from [http://www.web-page address \(URL\)](http://www.web-page address (URL)).

Example:

- Bryant, P., 1999. Biodiversity and Conservation. Retrieved on 4 October 1999 from <http://darwin.bio.uci.edu/~sustain/bio65/Titlepage.htm>

### *Thesis*

**i** Author, A.B., Year. Thesis title. Type of thesis, University with English name, City, State (2-letter abbreviation) for US places, Country (i.e. location of the University).

Example:

- Vlaeminck, B., 2006. Milk odd- and branched-chain fatty acids: indicators of rumen digestion for optimisation of dairy cattle feeding. PhD thesis, Ghent University, Ghent, Belgium.

## Illustrations

**i** Tables and Figures should be simple. The same material should not be presented in tabular and graphical form.

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- Each table is on a separate page at the end of the main text (one table per page).
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- Include as few abbreviations as possible.
- To define non-standard abbreviations, include a footnote such as:  
Abbreviations: AA = definition; BB = definition; etc.
- Treatment means are reported with meaningful decimals. The number of significant figures given should indicate the precision of the experiment. In practice, quote as significant all figures that are certain plus the first uncertain one.
- Number of decimals for the indicators of residual variability (e.g. RSD, SEM, RMSE) are either identical to that chosen for mean values or have one more decimal (recommended). The choice is consistent in all the tables.
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