

### Important notes:

Do NOT enter author and affiliation information on this document. You will be able to enter this information online when you submit the abstract.

Do NOT write outside the boxes. Any text or images outside the boxes **will be deleted**.

Do NOT alter the structure of this document. Simply enter your title and abstract in the gray boxes. The document will be automatically processed – if you alter its structure your submission will not be processed correctly.

**Title:** (Use Normal styl (times new roman). Only capitalise the first letter of the first word. No full stop at the end of the title)

## **A comparison of sole lesion development for Norwegian Dairy Cattle and Holstein Friesian dairy cattle on three different systems in lactation 1 and 2**

**Summary:** (Your summary must use *Body text (times new roman)* style and must not be longer than this box)

**Introduction** Sole lesions and lameness are significant problems for dairy cow production and welfare. Producers are increasingly incorporating non-Holstein genetics into the make-up of dairy herds for a number of reasons, particularly to promote improved fertility and health. However, much of the evidence that alternative breeds improve hoof health characteristics is anecdotal. The aim of the present study was to assess the effects of Holstein Friesian (HF) and Norwegian dairy cattle (N) genotypes on lameness parameters in dairy cattle within different production systems.

**Material and methods** Following calving, HF (n = 39) and N (n = 45) heifers were allocated to one of three dietary treatments (high level of concentrate (“High”), low level of concentrate (“Low”), and grass-based (“Grass”), referred to as “Diet” in the model). Treatments were balanced for breed. In Lactation 1 and 2 animals on the “Low” treatment were offered a diet of grass silage and concentrate at a ratio of 70:30 and 65:35, respectively for the first 100d of lactation. After 100d of lactation the grass silage to concentrate ratio changed to 80:20 and 75:25, for Lactations 1 and 2 respectively. Animals offered the “High” treatment received a diet of grass silage and concentrate at a ratio of 40:60 and 35:65 for the first 100d of Lactation 1 and 2 respectively. Similar to the “Low” cows, the proportion of concentrates was reduced 100d post-calving to 50:50 and 45:55, in Lactations 1 and 2 respectively. “High” and “Low” animals were continuously housed indoors on a rotational system so that they spent similar amounts of time on slatted and solid concrete floors and were exposed to similar conditions produced by automatic scrapers. Animals on the “Grass” treatment grazed from Spring to Autumn in both years of the study, so that most animals on this treatment grazed from around peak to late lactation. Pathways used by “Grass” cows when moving to and from the parlour were mainly stone/dust lanes with short segments on grass and concrete. While housed, “Grass” cows were offered a diet based on grass silage with a low level of concentrate supplementation. In Lactation 1 “Grass” cows were offered a diet with a grass silage to concentrate ratio of 55:45 from calving to turnout. In Lactation 2 “Grass” cows were offered a total mixed ration with 9 kg of concentrates per day and fresh grass silage. Both hind hooves of each animal were scored for sole lesions 4 times during both the first and second lactations, at 4 observation periods during lactation as follows: (1) -8 to 70d post-calving, (2) 71 to 150d post-calving, (3) 151 to 225d post-calving, and (4) 226 to 364d post-calving. Sole lesions were scored for severity and extent of the hoof affected, using the methodology described by Livesey *et al.* (1998) and the hoof map described by Greenough and Vermunt (1991). Lesion scores over the 6 zones of the sole were added to obtain cumulative lesion scores for the whole claw (zones 1 to 6, “total lesion score”) and for the sole (zones 4 to 6) and white line (zones 1 to 3) separately. Scores for both hind claws were added so that each animal had one score. Data were analysed using each observation as a repeated measure in a REML variance components analysis with Lactation, Period (during lactation), Diet, Breed and interaction terms as fixed effects.

**Results** All cumulative lesion scores were higher in Lactation 1 than in Lactation 2 ( $P < 0.001$  for total, sole, and white line lesion scores). Total cumulative lesion scores were highest in Period 2, which corresponds with peak lactation. Breed and Diet effects are shown in Table 1. HF cows had higher total lesion scores and higher white line lesion scores than N. Cows on the “Grass” treatment had higher total lesion and sole lesion scores compared to the “Low” treatment. There were no significant interactions between breed and diet.

**Table 1** Breed and diet effects on hoof lesion scores

	Breed				Diet				
	HF	N	s.e.d	P	Grass	High	Low	s.e.d	P
Total Lesion Score	11.5	9.4	1.30	0.047	12.4 <sup>b</sup>	10.2 <sup>a,b</sup>	8.7 <sup>a</sup>	1.58	0.023
Sole Lesion Score	6.1	5.0	0.81	n.s.	7.0 <sup>b</sup>	5.2 <sup>a,b</sup>	4.5 <sup>a</sup>	0.98	0.009
White Line Lesion Score	5.4	4.4	0.56	0.023	5.4	4.9	4.3	0.68	n.s.

**Conclusions** These results show that both breed and nutritional/housing regimes influence the development of hoof lesions in dairy cows. The reduced levels of total lesions and white line lesions indicate potential breed differences in relation to predisposition to development of lameness. The increased levels of sole lesions in cattle on the “Grass” rather than the “Low” treatment merits further investigation of both nutritional effects and environmental aspects, for example the condition of laneways required to access pasture.

**Acknowledgements** The authors gratefully acknowledge funding from AgriSearch and DARDNI.

### **References**

Greenough, P.R. and Vermunt, J.J. 1991. Veterinary Record. 128, 11-17.  
Livesey, C.T., Harrington, T., Johnston, A.M., May, S.A., and Metcalf, J.A. 1998. Animal Science. 67, 9-16.

**BSAS/WPSA/AVTRW/ASF**  
**Guidelines for the Preparation and Submission of Summaries for the Annual Conference**  
**HEALTHY FOOD FROM HEALTHY ANIMALS, 24-25 April 2012, Nottingham University**

A one-page summary allows **BSAS/WPSA/AVTRW/ASF** to referee your proposed paper for scientific content, ethics, presentation and relevance. It may be published in the series Advances in Animal Biosciences or British Poultry Abstracts and must be suitable for use as a scientific reference. Submission of a summary is deemed a commitment to present the paper. Previews will not be accepted. Please ensure all authors are in agreement with being identified as being associated with the paper. The summary should be discussed with any co-authors and read critically by a colleague who has not been closely involved. Authors will be asked to rewrite substandard summaries or the summary may be rejected. Changes and corrections in titles and authors after submission, other than those requested, are to be avoided.

**SUMMARY SUBMISSION DEADLINE Friday, 2 December 2011. We cannot accept submissions after this date.**

### **COMMERCIAL PRODUCTS**

Where results on commercial products are being presented, authors should ensure, before submitting their summary that both their organisation and the commercial company involved give permission to publish.

### **CONTENT and FORMAT**

Summaries should be complete in themselves. The summary including any tables or figures must fit on to the one page template. Please refer to the example summary for the correct layout.

### **Do's and don'ts**

- 1. Please do not alter the template or margins in any way.**
- 2. Please use the format and layout shown in the example summary**
- 3. PLEASE SUBMIT SUMMARY IN Microsoft Word 2007 or earlier versions.**

**Please ensure that Tables / Figures are in black and white not colour. The publication is black and white therefore we cannot accept colour figures/tables, graphs or text.**

**Title** The title should be descriptive, specific, and concise. It should state the species concerned. It should replace information otherwise found in the main text. The title should be two lines maximum (Times New Roman 12 lower case Bold font) and not have a full stop (point) at the end. No abbreviations please. Do not type anything above or below the title in the title box (author names and affiliations are added at a later stage).

**Text** The summary may contain graphs and / or tables which complement the text.

The entire text of the summary should be in Times New Roman 10 font with single spacing. Summaries printed in smaller font sizes (including font in graphs and tables) will be returned. Summaries should be justified left and right, not centred on the page

Please ensure that British English spelling is used.

Different sections (introduction, material and methods, etc.) should be separated by one clear line; section headings should be in bold and text should begin on the same line as the heading (see example summary).

**Introduction** The Introduction should state the background and objectives of the work.

**Material and methods** should describe clearly the methods used, including numbers and types of animals.

**Statistical analyses** Statistical conventions should be those used in Animal. A copy of this can be obtained at [www.animal-journal.eu/statistical](http://www.animal-journal.eu/statistical). The experimental design and statistical methods must be clear: vague statements such as "the data were analysed using Minitab" are not acceptable. Experiments where treatments and pens (or groups) of animals are confounded are not acceptable.

**Results** obtained, together with relevant statistical analysis, should be presented in sufficient detail to support the conclusions drawn. Treatment means should be presented with appropriate standard errors of means or differences. The minimum number of decimal places required to demonstrate significant differences should be used. Probability values must be presented to support conclusions. Probability levels of  $P > 0.05$  are NOT significant.

The use of percentages should be avoided wherever possible; concentrations or compositions should be expressed as mass per unit mass or mass per unit volume; decimal proportions should be used for common ratios such as digestibilities.

The results of surveys will be accepted if the work has been conducted with the same scientific rigour as designed experiments

**Tables** Please ensure that the font size in a table is Times New Roman 10 (not bold or italics). Only horizontal single lines (equal thickness) should be used in the table (see example). Table titles should be numbered sequentially and presented above the Table.

**Figures** Graphs should be in black and white, with no border on the legend or the graph itself. Figure titles should be numbered sequentially and presented underneath the Figure. All figures and tables must be supplied in black/white or grey scale mode. **We cannot accept figures, tables or text in colour or RGB.**

**Conclusions** should clearly state the author's view of the implications of the results to scientific understanding and practical use. Vague sentences are not acceptable. A discussion is not required.

**Acknowledgements** Please ensure that funders of the work are duly acknowledged

### References

Studies cited in the body of the summary should refer to the Author(s) and the year of the study. The list of references presented at the end of the summary should follow the recommendations of Animal:

Author(s) surname and initials, year, full title of the journal volume, pages. e.g.

Livesey, C.T., Harrington, T., Johnston, A.M., May, S.A., and Metcalf, J.A. 1998. *Animal Science*. 67, 9-16

The title of a Journal article or abstract should **not** be included

References should be listed alphabetically by first author surname. No more than 5 references should be given

Before submitting a summary please refer to the check list below

- ✓ Is British English used throughout the summary?
- ✓ Is the complete summary presented in black and white, including graphs and tables?
- ✓ Do the font size and styles conform to summary guidelines?
  - Title: Times New Roman, bold, Font size 12, Lower case
  - Summary: Times New Roman, Font size 10
  - Section headings: Times New Roman, bold, Font size 10, immediately preceding the text of the section
  - Tables and graphs: Times New Roman, Font size 10
- ✓ Do the tables conform to summary guidelines?
  - Font: Times New Roman, Font size 10 (no bold or italic font)
  - Borders: Only horizontal single lined borders used and kept to a minimum
- ✓ Do the graphs/images conform to summary guidelines
  - Font: Times New Roman, Font size 10 (no bold or italic font)
  - Borders: The graph/image should not be framed with a border
  - Colour: Graphs/images are presented in Black and White
- ✓ Do the results comply with the statistical conventions used for Animal?
- ✓ Have the funding organisations that supported the work been acknowledged?
- ✓ Have all authors (and relevant funding bodies and/or commercial) agreed to the submission and publication of this summary in its current form?
- ✓ Has the document been saved as a word .doc or docx (Word 2007 or earlier version)

## How to use the online summary submission system

### **Important information**

- If you are submitting more than one summary you can use the same login for each summary.
- You can alter your summaries at any time up to the deadline
- Do not include author names in the title or body of your summary because a “blind” reviewing process may be used – you can enter the names online during the submission process.

### **1 The submission process**

- Log in to the submission system when you have prepared your summary - enter your email address and the password you chose when you registered with the system.
- You will be taken to a screen from which the submission process starts. Please read the instructions on this screen carefully. If you want to submit a new summary you should click the link that says “Click here to submit a new summary”.
- Submitting a summary is a multi-step process. Each step asks several questions. Some questions are marked “required” and you will not be able to complete your submission until these questions have been answered.
- If you have to stop part way through the process your submission will be held in temporary storage until you return later and complete all the questions. When you log in again you can click on your incomplete summary and resume submission.

### **2 Amending a submission**

You may wish to change your submission. You can do this at any time up to the deadline.

- Log in to the summary submission system
- You will see a list of the summaries that you have submitted. Click on the summary that you wish to change.
- Amending an summary is just the same as the original submission process except that the online form will be automatically filled in with the answers that you gave previously. You don’t have to change an answer if you don’t want to.
- When you reach the final step and press “Finish” you will be sent an email confirming that your summary has been amended.

### **3 Queries**

If you have any queries about the submission process or you want to withdraw an summary please contact Bridget Hilton on bsas@sac.ac.uk If you have a reference number for your summary please enter this in the subject heading of the email ‘Annual Conference 2012\_Ref 000’