Advances in Animal Biosciences

Management Board
Nigel Scollan (chair), Bruce Beveridge, Christopher Knight, Howard Simmins (BSAS); Philippe Chemineau, Matthias Gauly, Andrea Rosati (EAAP); Nicolas Friggens, Stephane Ingrand, Jaap Van Milgen (INRA)

Editor-in-Chief
Cledwyn Thomas

Aims and Scope
Advances in Animal Biosciences is an associated publication to the journal animal. It aims to publish high-quality conference, symposium and workshop proceedings about animal-related aspects of the life sciences with emphasis on farmed and other managed animals. These can be in the form of a book of abstracts, summaries or complete papers. The format will highlight the title of the meeting and organisations involved but the publications will have the added advantage of forming a series under Advances in Animal Biosciences.


However, due to the integrative nature of biological systems, monographs and conference proceedings dealing with the translation of basic and strategic science into the whole animal and farming system and the impact on Productivity, Product Quality, Food Security, the Environment, Climate Change and Humans will be particularly welcome.

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Reproductive performance of dairy and beef herds is vital to the profitability and sustainability of cattle farms.

But while science has focused on ways to improve cow fertility, research into aspects of male fertility has so far lagged behind.

Join experts from across the globe as they discuss the significant developments and challenges facing bull fertility, from the way genetically-assisted selection has revolutionised the dairy industry, to reliably predicting the fertility of individual bulls in the laboratory.

Specialists from academia, veterinary practice and industry will also discuss topics on male reproductive physiology, nutrition and puberty, and the genomics of bull fertility.

Other topics will include optimisation of semen collection and processing, fertility of AI bulls, pathophysiology of bull subfertility, sex-sorting of semen, sperm-oocyte-reproductive tract interactions and thermoregulation.

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For more details and information, go to www.bsas.org.uk/events
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The Society’s Journal is *Animal* which publishes high quality fundamental and applied research and is an exciting international journal of animal bioscience. Animal publishes cutting edge research, hot topics and horizon-scanning reviews on animal-related aspects of the life sciences.

The Society organises major scientific and specialist conferences on key issues facing the science related to animals.

If you would like to join or receive further information about the British Society of Animal Science contact:

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The summaries have been edited. Views expressed in all contributions are those of the authors and not those of the BSAS.

This publication contains all the summaries that were available at the time of going to press.

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## CONTENTS

<table>
<thead>
<tr>
<th>Summary List</th>
<th>i-xix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summaries submitted</td>
<td>1-234</td>
</tr>
<tr>
<td>Summaries invited</td>
<td>235-277</td>
</tr>
<tr>
<td>Author Index</td>
<td>I-V</td>
</tr>
</tbody>
</table>
**Sheep and Goats**

84 Mathematical growth functions to model live-weight in sheep
F M McGovern, N McHugh, D P Berry

85 The genetic basis of pneumonic lesions and pleurisy in New Zealand lambs
K M McRae, S J Rowe, H J Baird, M J Bixley, S M Clarke

86 An investigation into the relationship between ewe body condition score change, ewe breed, and litter size of flocks enrolled in the Irish Central Progeny Test programme
F P Campion, P Creighton, A G Fahey, T M Boland

87 Concentrations of adiponectin, leptin, ghrelin and resistin in goat colostrum and mature milk from seven breeds
T Lorenzo-Yedra, A Arguello, B Earley, M G Córdoba, B Panea, M J Alcalde, N Castro

88 The impact of maternal genetic indexes and country of origin on lambing performance through comparing New Zealand and Irish ewes
N Fetherstone, N McHugh, T M Boland, F M McGovern

89 An analysis of the factors effecting lamb mortality using the Teagasc BETTER lowland sheep farms
F P Campion, C O Lynch, M G Diskin

90 Drivers and barriers to adoption of Electronic Identification (EID) technology by commercial sheep farmers
E Lima, T Hopkins, E Gurney, F Lovatt, O Shortall, P Davies, J Kaler

**Precision Agriculture**

91 Detection of lameness in sheep using different machine learning algorithms
E Walton, J V Diosdado, J Mitsch, T Dottorini, T Canning, C Casey, K Ellis, J Kaler

92 Cardiovascular measures during routine practices for feed efficiency assessment in beef cattle
J E Martell, J C Munro, Y R Montanholi

93 Beef Monitor: tracking beef cattle growth and predicting carcass characteristics of live animals
G A Miller, J J Hyslop, D W Ross, S Troy, D Barclay, A R Edwards, W A M Thomson, C-A Duthie

94 Effect of sampling frequency, window size and sensor position in the classification of sheep behaviour
E Walton, C Casey, J Mitsch, J A Vazquez Diosdado, J Yan, K A Ellis, A Winterlich, J Kaler

95 Blue light from light-emitting diodes (LEDs) directed at a single eye elicits a dose-dependent suppression of melatonin and affects milk production in dairy cow
S T Butler, M M Herlihy, M B Nolan, C O’Brien, B A Murphy

96 Use of thermal imaging for the assessment of pyrexia in pre-weaned artificially reared calves
D J Bell, A I Macrae, M A Mitchell, C S Mason, A E Jennings, M J Haskell

97 Combining offline and online classifiers for the classification of sheep behaviour
V Paul, J A Vazquez Diosdado, N Bollard, K A Ellis, J Kaler

**Grass and Forage**

98 Assessing and monitoring soil quality in Irish grassland soils
D P Wall, G Bondi

99 Impact of soil-enhancers and plant bio-stimulants on the microbial profile of wilted ryegrass forage: A field experiment
A Christou, K Le Cocq, C Hodgson, T Cogan, M Gaffney, D R Davies, M R F Lee
Concentrations of adiponectin, leptin, ghrelin and resistin in goat colostrum and mature milk from seven breeds

T Lorenzo-Yedra, A Arguello, B Earley, M G Córdoba, B Pancha, M J Alcalde, N Castro

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Application The present study found that adiponectin, leptin, resistin and ghrelin hormones are secreted biologically in goat colostrum and milk. Further studies will assess their relationships with fat metabolism and immune system development.

Introduction The importance of passive or humoral immunity, through absorption of colostral antibodies or immunoglobulin is well recognised. White adipose tissue, considered a passive site of lipid storage, is reported to have a role in metabolic and endocrine functions; secreting a range of hormones known as adipokines such as adiponectin, leptin, ghrelin and resistin (Hussein et al., 2015). In addition, these major adipokines have been found in human milk and in some livestock species (Guzel et al., 2017). There is a paucity of literature regarding hormones that may be associated with energy metabolism in goats, thus the objective of this study was to measure the concentration of adiponectin, leptin, ghrelin and resistin in goat colostrum and mature milk from seven different breeds.

Material and methods Seventy colostrum and milk samples were obtained from seven goat breeds (n=10 goats per breed); (Majorera (MAJ), Palmera (PAL), Tinerfeña (TNF), Del Guadarrama (GU), Florida (FL), Payoya (PY) and Verata (VE)). The goats’ diet was fed according to INRA recommendations and was balanced for energy and protein levels. Colostrum samples (50 mL) were collected immediately post-partum (PP) and milk samples (50 mL) were collected on day 30 PP. Each sample was divided into four aliquots. All aliquots were preserved by freezing at -20°C until analysis. Hormonal concentrations were determined in skimmed colostrum and milk. Skimming was performed by centrifugation at 4600 rpm, 10 minutes, 4°C. Colostrum and milk hormone concentrations were measured using commercially available ELISA kits (Leptin and adiponectin (Cusabio Biotech kits); Resistin and ghrelin (MyBioSource kits). Samples were analysed in duplicate. Statistical analysis was performed using SAS, Version 9.4 (SAS Institute Inc., Cary, NC). The PROC MIXED procedure of SAS with repeated measures was used to evaluate the concentration of hormones in colostrum and milk.

Results A breed effect was found for all hormones except milk ghrelin concentration (Table 1). Leptin concentration was greater, and in colostrum, for the GU and PY, respectively, with no differences between colostrum and milk concentration for the other breeds. Adiponectin concentration was greater in colostrum than in milk for all breeds except for the PY breed. Ghrelin concentrations were greater in colostrum than in milk for the PAL, TNF and VE breeds. Resistin concentration was greater in milk than in colostrum for GU, PY and VE breeds.

Table 1 Leptin, adiponectin, ghrelin and resistin concentration in colostrum and milk (day 30 PP) from seven goat breeds

<table>
<thead>
<tr>
<th>Breed</th>
<th>Leptin (ng/mL)</th>
<th>Adiponectin (µg/mL)</th>
<th>Ghrelin (ng/mL)</th>
<th>Resistin (ng/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C</td>
<td>M</td>
<td>SEM</td>
<td>C</td>
</tr>
<tr>
<td>MAJ</td>
<td>0.03 ± 0.07</td>
<td>0.29</td>
<td>73.80 ± 11.06</td>
<td>4.29 ± 0.07</td>
</tr>
<tr>
<td>PAL</td>
<td>0.47 ± 0.10</td>
<td>0.14</td>
<td>82.20 ± 11.02</td>
<td>2.59 ± 0.10</td>
</tr>
<tr>
<td>TNF</td>
<td>1.17 ± 0.07</td>
<td>0.07</td>
<td>17.51 ± 7.53</td>
<td>4.40 ± 0.17</td>
</tr>
<tr>
<td>GU</td>
<td>0.98 ± 0.12</td>
<td>0.03</td>
<td>8.38 ± 4.29</td>
<td>1.20 ± 0.14</td>
</tr>
<tr>
<td>FL</td>
<td>4.72 ± 1.10</td>
<td>1.37</td>
<td>123.03 ± 9.87</td>
<td>20.32 ± 0.17</td>
</tr>
<tr>
<td>PY</td>
<td>2.22 ± 0.33</td>
<td>0.35</td>
<td>11.38 ± 9.29</td>
<td>1.06 ± 0.16</td>
</tr>
<tr>
<td>VE</td>
<td>0.42 ± 0.09</td>
<td>0.12</td>
<td>79.63 ± 9.75</td>
<td>4.86 ± 0.21</td>
</tr>
</tbody>
</table>

| SEM    | C             | M                   | 12.30 ± 0.89   | 0.02 ± 0.03    | 3.94 ± 0.25    |

n=10 goats per breed; C: Colostrum, M: Milk, SEM: Standard Error of Means, *Lmeans within a row (for each hormone) with different superscripts differ significantly (P<0.05), **Lmeans within a column with different superscripts differ significantly (P<0.05). The values are expressed as Lmeans (SEM).

Conclusion These data confirm that adiponectin, leptin, ghrelin and resistin are present in goat colostrum and milk. The function of these adipokines in colostrum will require further investigation as they may have important roles, such as energy intake and immune system development, in the neonatal kid goat.

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