Proceedings of the British Society of Animal Science

2003

Published by British Society of Animal Science

British Society of Animal Science

The British Society of Animal Science aims to provide the opportunity for those with an interest in animals and animal production to exchange views, ideas and information. It is an energetic and active society with about 1000 members from over 30 countries throughout the world. Today, as ever, the Society is the natural meeting point for all of those with an interest in animal science. Its membership is drawn from research, education, advisory work, commerce and the practical livestock industry.

The Society's Journal is Animal Science which publishes fundamental and applied research and is a major scientific title of international repute. Papers reporting findings from basic and applied research relevant to all aspects of animal science can be found in it.

The Society organises a major scientific meeting once a year and occasional specialist meetings on key issues facing animal production. If you would like to join or receive further information about the Society contact:

> The Secretary BSAS PO Box 3 Penicuik Midlothian EH26 0RZ United Kingdom.

Tel:	+44 (0)131 445 4508
Fax:	+44 (0)131 535 3120
Email:	BSAS@ed.sac.ac.uk
Website:	http//:www.bsas.org.uk

Proceedings of the British Society of Animal Science 2003

Published by British Society of Animal Science

The Proceedings of the British Society of Animal Science constitute summaries of papers presented at the Society's Annual Meeting in York in March 2003

The summaries have not been edited and the Society can accept no responsibility for their accuracy. Views expressed in all contributions are those of the authors and not those of the British Society of Animal Science.

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

© 2003 British Society of Animal Science

ISBN 0906562414

CONTENTS

			PAGE
Programme		i-xviii	
Sun	nmaries		1-241
	1-63	Theatre presentations	
	64-206	Poster presentations	
	207-240	Invited papers	
	241	RSPCA/BSAS paper	

Author Index

I-IV

The British Society of Animal Science is extremely grateful to the following organisations who have generously supported the Annual Meeting 2003



BASF Group









Click on the following links:

- How to use this information
- Proceedings 1999
- Proceedings 2000
- Proceedings 2001
- Proceedings 2002
- Proceedings 2003

PROGRAMME

THEATRE PRESENTATIONS

PHYSIOLOGY

1	Induction of ovulation with GnRH or oestradiol benzoate lowers plasma progesterone concentration within the first week of ovulation in non-lactating Holstein cows B V E Segwagwe, K L Macmillan & P D Mansell
2	Tissue-specific differences in insulin receptor m-RNA isoform ratio in two dairy cow breeds A R G Wylie & D J Devlin
3	Effects of rearing regime on milk production and metabolic hormone concentrations in high genetic merit Holstein-Friesian dairy heifers <i>S M Woods, A F Carson, A R G Wylie & J D McEvoy</i>
4	Seasonal tissue changes in Scottish Blackface ewes over multiple production cycles NR Lambe, M J Young, G Simm, J Conington & S Brotherstone
5	Breed and parity differences in ovine placentation: Implications for placental efficiency and lamb vigour

C M Dwyer, S K Calvert, M Farish, S Cotham, J Donbavand, J Chirnside & H E Pickup

RUMINANT NUTRITION

FACTORS AFFECTING INTAKE

6	Do cows regulate diet choice within the short-term time frame of a meal? M P Yeates, B J Tolkamp & I Kyriazakis
7	Consequences of variation in feeding behaviour for the probability of cows starting a meal as estimated from pooled data M P Yeates, B J Tolkamp & I Kyriazakis
8	Effects of live weight and condition score on food intake of ewe lambs B J Tolkamp, G C Emmans & I Kyriazakis
	NUTRITION AND PRODUCTION
9	Pressed sugar beet pulp as an alternative fibre source for lactating dairy cows D J Humphries, J D Sutton, D M Cockman, M W Witt & D E Beever
10	The effect of grass and maize silage quality on diet digestibility and performance of beef cattle <i>R M Kirkland & D C Patterson</i>
11	Intake, growth and feed conversion in weaned suckled bulls finished on a cereal-based ration

Intake, growth and feed conversion in weaters and J J Hyslop, R Keatinge & D G Chapple

COMPANION ANIMAL WELFARE

Preliminary investigations of behavioural and physiological responses to castration in horses *R A Eager, J Price, E Welsh & N K Waran*Factors influencing stereotypical behaviour patterns in horses: a review of 52 clinical cases *R A Casey*The importance of aspects of the cage environment to female laboratory rabbits *S C Seaman, R B D'Eath & N K Waran*The effects of games on the dog-owner relationship *N J Rooney & J W S Bradshaw*Dominance hierarchies in domestic cats: useful construct or bad habit? *J W S Bradshaw & R E Lovett*

PIG HOUSING, NUTRITION AND GROWTH

17	The effect of dietary fermentable carbohydrates on lactic acid concentration in small intestinal digesta of piglets at ten days after weaning	
	B A Williams, A Awati, M W Bosch, S R Konstantinov & A D L Akkermans	
18	Effect of endosperm texture and IBIR rye translocation on performance of piglets between 15-25kg live weight fed diets based on wheat with or without xylanase J Wiseman & P H Simmins	
19	The relationship between liveweight and the intake of bulky foods in pigs E C Whittemore, G C Emmans, I Kyriazakis, P W Knap, P H Simmins & S Jagger	
20	Production responses of weaner pigs after chronic exposure to airborne dust and ammonia C M Wathes, T G M Demmers, N Teer, R P White, L L Taylor, V Bland, P Jones, D Armstrong, A Gresham, J Hartung, D J Chennells and S Done	

21 Use of visual image analysis for the description of pig growth in size and shape *A B Doeschl, C T Whittemore, D M Green, A V Fisher & C P Schofield*

FUNCTIONAL FOODS (2)

22 The effect of duration of feeding oilseeds to dairy cows on the persistency of response in milk fatty acid composition DI Givens, C Rymer, A R Moss & R Allison

23 Influence of duration of grazing on the fatty acid profile of *M. Longissimus dorsi* from beef heifers *F Noci, A P Moloney, P French & F J Monahan*

ISAE

CATTTLE LACTATION

24	An evaluation of the effect of concentrate proportion of the diet during previous and present lactations on animal performance of two breeds of lactating dairy cows T W J Keady & C S Mayne
25	A comparison of once-versus twice-daily milking on performance of late lactation dairy cows C P Ferris, C S Mayne, J P Frost, R C Binnie & M A McCoy
26	Effects of habituation to the milking parlour on production, health and fertility of Norwegian and Holstein dairy herd replacements H C F Wicks, A F Carson & M A McCoy
27	Prediction of dairy cattle reproductive performance in pastoral feeding systems J E Pryce, B L Harris & G Verkerk
28	Postpartum anovulatory intervals in two genotypes of pasture-fed Holstein-Friesian dairy cattle L R McNaughton, G A Verkerk, T J Parkinson, B Dow, K A Macdonald & C W Holmes

ANIMAL HEALTH

29	The effect of nutrition on nematode faecal egg output in lactating, organically managed ewes R Keatinge, J G M Houdijk, F Jackson & I Kyriazakis
30	Reducing the degree of protein scarcity rapidly increases immunity to nematodes in ewes J G M Houdijk, I Kyriazakis, F Jackson & R L Coop
31	The effects of metabolisable protein on the periparturient relaxation of immunity against <i>Teladorsagia</i> circumcincta in mature Friesland dairy ewes E C Partington, L A Sinclair, A M Mackenzie & J Donaldson
32	Leucocyte sub-sets and acute phase proteins are associated with productivity in Large White pigs M Clapperton, S C Bishop & E J Glass
33	Changes in the mechanical properties and the lesion score of the sole horn in first lactation heifers B Winkler & J K Margerison
34	Effect of mixing piglets prior to weaning on immune responses of piglets M J Allen, C M Harrison, A H Stewart & A M Mackenzie

APPLIED PIG ETHOLOGY

ISAE/BSAS

35	Preferential associations between group-housed growing pigs
	J L Durrell, I A Sneddon, N E O'Connell & V E Beattie
36	Stonechewing in pigs is influenced by feed level and by previous stonechewing experience
	R I Horrell & P J A'Ness
37	Alternatives to nose-ringing in outdoor sows: the provision of root crops
	H L Edge, C A Bulman & S A Edwards
38	Preference of pigs for illuminance
	NR Taylor, G Perry, M Potter, NB Prescott & C M Wathes
39	Influence of social status on the welfare of growing pigs reared in barren and enriched environments
	N E O'Connell, V E Beattie & B W Moss

RUMINANT NUTRITION

40	Optimising the fatty acid composition of beef muscle
	N D Scollan, M Enser, R I Richardson & J D Wood
41	Effects of product type and fatty acid composition on shelf life of nutritionally modified beef
	R I Richardson, M Enser, F W Whittington, K G Hallet, J D Wood & N D Scollan
42	Effects of red clover silage and supplementary vitamin E on the polyunsaturated fatty acid content of
	milk from Holstein-Friesian cows
	R J Dewhurst, J K S Tweed, W J Fisher, R M Al-Mabruk & N F G Beck
43	Effect of breed and diet on total lipid and selected shelf-life parameters in beef muscle
	H E Warren, M Enser, I Richardson, J D Wood & N D Scollan

GENETICS (1)

44	Changes in carcass composition with growth and the effect of feed type in lambs of two breeds and their cross		
	J M Macfarlane, R M lewis, G C Emmans, J E Donbavand & G Simm		
45	Modeling growth of lambs of two breeds and their cross with different feed types		
	J M Macfarlane, R M Lewis, G C Emmans, J E Donbavand & G Simm		
46	Predicting genetic gain when rates of inbreeding are constrained to pre-defined values		
	S Avendano, J A Woolliams & B Villanueva		
47	Developing a UK Dairy Fertility Index		
	E Wall, M P Coffey, S Brotherstone, J A Woolliams & A P F Flint		

FEED CHARACTERISTICS

48	The use of faecal inocula for estimating the <i>in vitro</i> digestibility of horse feeds
	J M D Murray, M J S Moore-Colyer, A C Longland & C Dunnett

- 49 An *in vitro* assessment of amino acid requirements for optimal xylan fermentation by mixed ruminal micro-organisms from the sheep rumen A Y Guliye, C Atasoglu, N McKain & R J Wallace
- 50 Predicting maize silage starch degradability by near infrared reflectance spectroscopy D K Lovett, E R Deaville, D I Givens & E Owen
- 51 Estimation of microbial N yield on red clover silages supplemented with barley by rumen simulation technique (RUSITEC) *G Jaurena, J M Moorby & D R Davies*

INTEGRATED APPROACH TO FUNCTIONAL TRAITS: COMBINING PHYSIOLOGY AND GENETICS

Integrated approach combining genetics, geonomics and muscle biology to manage beef quality I Cassar-Malek, K Sudre, J Bouley, A Listrat, Y Ueda, C Jurie, Y Briand, M Briand, B Meunier, C Leroux, V Amarger, D Delourme, G Renand, B Picard, P Martin, H Levéziel & J F Hocquette
Genetic aspects of body weight, body condition score, scrotal circumference and reproductive performance in Italian Holstein young bulls.
S Biffani, A B Samoré, F Canavesi, E Olzi & M Cassandro
The genetic relationship between interval to commencement of luteal activity postpartum and UK national fertility proofs for dairy cattle

M D Royal, E Wall & A P F Flint

GENETICS (2)

55	Genetic correlations among body condition score, body weight, and fertility in dairy cows D P Berry, F Buckley, P Dillon, R D Evans, M Rath & R F Veerkamp
56	Genetic parameters for locomotion and composite type traits for the Jersey and Guernsey dairy breeds in the United Kingdom (UK)
	M F Paget, G J T Swanson & R A Mrode
57	The influence of cow genetic merit for milk production on response to level of concentrate supplementation in a grass based system
	P Dillon, J Kennedy, P Faverdin, L Delaby, F Buckley & M Rath
58	Evaluation of dual-purpose cows on a seasonal grass-based system of milk production
	F Buckley, P Dillon, R D Evans & J F Mee

SHEEP NUTRITION

59	Effect of digestible undegradable protein (DUP) concentration of concentrates offered to ewes on grass-based diets in late pregnancy on colostrum production and lamb performance <i>R W Annett & A F Carson</i>
60	The effect of maternal undernutrition on muscle fibre type in the newborn lamb A J Fahey, J M Brameld, T Parr & P J Buttery
61	The effect of vitamin E and long-chain polyunsaturated fatty acid supplementation of pregnant and lactating ewes on the transfer of vitamin E to the lamb J L Capper, R G Wilkinson, E Kasapidou, S E Pattinson, A M Mackenzie & L A Sinclair
62	Effects of diet and vitamin E supplementation on the distribution of vitamin E in plasma, muscle, liver and adipose tissue in lambs fed on concentrates alone or with grass silage <i>E Kasapidou, R I Richardson, J D Wood, L A Sinclair, R G Wilkinson & M Enser</i>
63	Effect of herbage allowance and concentrate feed level offered to ewes in late pregnancy on ewe and lamb performance A F Carson, L E R Dawson & A S Laidlaw

POSTER PRESENTATIONS

PIG NUTRITION

64	The effect of steeping on soluble phosphorus levels in wheat, wheatfeed and soyabean meal J D Beal, S J Niven, P H Brooks & B P Gill
65	Performance of grower/finisher pigs fed barley and wheat-based diets containing different levels of a ß- glucanase and xylanase enzyme combination <i>P H Simmins & J Wiseman</i>
66	The use of phytase in finishing pig diets M E E McCann, K J McCracken, V E Beattie, W Henry, S Smyth & R Bradford
67	Application and comparison of two models of phosphorus flows in growing pigs M Schulin-Zeuthen, J B Lopes, E Kebreab, D M S S Vitti, A L Abdalla, M De L Haddad, L A Crompton, J A N Mills & J France
68	The effect on litter performance at birth of feeding gilts fermented liquid feed (FLF), non-fermented liquid feed (NFLF) or dry feed (DF) for 14 days pre-farrowing <i>C A Tsourgiannis, V Deme čková, J Eddison & P H Brooks</i>
69	Fermented liquid feed can reduce <i>E.coli</i> bloom at farrowing and prevent constipation problems during lactation <i>V Demečková, C A Tsourgiannis, P H Brooks & A Campbell</i>
70	Effect on average daily feed intake during lactation and piglet growth during the first 2 weeks of life of feeding sows fermented liquid feed, non-fermented liquid feed or dry feed <i>V Demečková, C A Tsourgiannis & P H Brooks</i>
71	Effect of dietary salt (NaC1) level on the growth performance of liquid fed growing-finishing pigs CA Tsourgiannis, V Demečková, J Eddison & P H Brooks
72	Modelling the effects of the thermal environment and dietary composition on pig performance <i>I J Wellock, I Kyriazakis & G C Emmans</i>

PHYSIOLOGY

73	Supplementation with rumen inert fat of late pregnant dairy cows modifies the relationship between body condition and plasma leptin concentration <i>G Jaurena, J M Moorby & N F G Beck</i>
74	Plasma metabolite and hormone responses to rumen inert fat and protein supplies during the dry period in dairy cows
	G Jaurena, J M Moorby & N F G Beck
75	Comparative study on amplification methods dedicated to gene profiling during trophoblast expansion in bovine embryos
	S Degrelle, I Hue & J-P Renard
76	The study of reproduction failures in dairy cattle by metabolic profile test in Tabriz Gh Moghaddam, H Daghigh Kia, P Yasan & S Alijani

PHYSIOLOGY

77	Effects of four contrasting grassland-based milk production systems on dairy cow fertility C P Ferris, M A McCoy, W J McCaughey & D C Patterson
78	The influence of GnRH treatment on the rate of reproductive development in bull calves S Madgwick, E T Bagu, R Duggavathi, P M Bartlewski, D M W Barrett, S Huchkowsky, S Cook, A P Beard & N C Rawlings
79	Repeated fence-line ram exposure advances the timing and improves the synchrony of oestrus and lambing in ewes <i>P A R Hawken, A C O Evans & A P Beard</i>
80	The effect of energy intake level, body condition score, and leptin on ovulation rate in fat-tailed ewes A Towhidi, F Rostami, H Khazali, A H Ahadi
81	Effect of nutrition on endometrial progesterone receptor expression in ewes J A Abecia, C Sosa, J M Lozano, C Viñoles, F Forcada, M Forsberg & A Meikle
82	The effect of melatonin treatment during the seasonal anoestrus on the superovulatory response and embryo production of high-prolificacy Rasa Aragonesa ewes before culling <i>F Forcada, J A Abecia & J A Valares</i>
83	Nutritional effects on maternal blood metabolites and on outcome of pregnancy of dry season kidding Tswana goats O R Madibela & B V E Segwagwe
84	Production of polyclonal antibody for ciprofloxacin detection in Brazilian livestock S P Gobbo, C Longo, I C S Bueno, K M R Duarte & C F Meirelles
85	The influence of birth order and duration of farrowing on concentrations of metabolites in the umbilical cord blood of newborn piglets <i>S E Ilsley & H M Miller</i>

ANIMAL HEALTH

ids on eosinophils numbers in the gut of milk or milk fe, M A Lomax, A Mackellar, J F Huntley &
position of gut mucosa in calves during the first 3
r, J R Scaife & M A Lomax
vo lymphocyte stimulation response to
r, J R Scaife, M A Lomax & R Barker
oxidant properties, and a Neutraceutical mix on the
J Blanchard, L Tucker & P Toplis
ruminants
to, B Guida & O A E Sparagano
gement on equine predisposition to white line disease
i s i

Animal Health

92	Effect of three types of polysaccharide on fermentation parameters of pony faecal inoculum when incubated <i>in vitro</i> A C Longland & J M D Murray
93	Influence of dietary protein supply on resistance to infection with <i>Haemonchus contortus</i> in Ile de France and Santa Ines lambs <i>P A Bricarello, A F T Amarante, J G M Houdijk, R A Rocha, S L Cabral Filho, & S M Gennari</i>
94	The effect of pre-weaning mixing and vitamin C supplementation on piglet performance C Blaken, M J Allen, A H Stewart & A M Mackenzie

Growth

95	Ontogeny of factors thought to control the development of ovine muscle in utero A J Fahey, J M Brameld, T Parr & P J Buttery
96	Intake, liveweight gain and feed conversion in organic Scottish-Blackface lambs finished on contrasting cloverbased silages and concentrates with different ratios of wheat and beans J J Hyslop, W A Murray & R Keatinge
97	Liveweight and pre-weaning growth in suckled calves sired by either Aberdeen Angus or Charolais bulls from contrasting autumn-calving continental x dairy cows over three years <i>J J Hyslop, R Keatinge & D G Chapple</i>
98	Evaluation of an ensiled mix of moist sugar beet feed (pressed pulp) plus maize distillers dark grains as a supplement for twin-bearing March-lambing ewes fed straw-based diets D G Chapple, K P A Wheeler, M W Witt & W E Blackburn
99	Extensive finishing of weaned suckled heifers sired by Aberdeen-Angus or Charolais bulls from autumn- calving continental cross cows D G Chapple, K P A Wheeler & J J Hyslop
100	Improvement of the growth and performance of Holstein neonatal calves receiving the microbial additive saccharomyces cerevisiae B Saremi & A A Naserian
101	Use of visual image analysis for the management of pig growth in size and shape <i>R P White, D J Parsons, C P Schofield, D M Green & C T Whittemore</i>

ETHOLOGY

ISAE/BSAS

102	Too close for comfort? The effects of social facilitation on feeding behaviour in the horse (equus caballus) S E Redgate, N K Waran, H P B Davidson & C Morgan
103	Training influences problem-solving abilities in dogs (canis lupus familiaris) B Osthaus, S E G Lea & A M Slater
104	Creep feeding status of piglets can be identified by an automatic marking device H F Lee, C A Morgan, M C Appleby & N K Waran
105	The effect of weaning weight and social challenges on an individual pigs ability to adapt to the postweaning environment H L Edge, M A Varley, P Rowlinson

CATTLE NUTRITION

106	Effects of feeding yeast (<i>Saccharomyces cerevisiae</i>) on productive performance and blood components of lactating Holstein dairy cows M Dehghan Banadaky, A Nik Khah & A Zali
107	The effect of ammoniated and roasted barley on rumen pH, milk yield and milk composition of lactating dairy cows M H Fathi & A Nik Khah
108	Prediction of nitrogen degradability in grass silages using nutrient concentration and fermentation variables T Yan & R E Agnew
109	Effect of dietary protein and energy concentration on the fattening performance of buffalo male calves in southern Iran <i>H Mahmoudzadeh, H Fazaeli & I Kord-Nejad</i>
110	Effect of salts on sulphite on yeast numbers and temperature of whole-crop wheat silage <i>R R Edwards</i> , <i>J K Margerison & V Kuri</i>
111	The effect of salts of sulphite on intake levels of urea treated whole-crop wheat silage fed to grazing Holstein- Fresian dairy cattle <i>R R Edwards, J K Margerison & B Winkler</i>
112	Effect of weaning at 6 or 8 weeks old on the performance of dairy-bred beef calves S P Marsh, A M Mackenzie & E L James
113	Validation of a model to predict live weight and estimate dry matter intakes of individual dairy cows on commercial farms H C F Wicks & J D Leaver
114	A comparison of silage and dried common reed (<i>phragmites australis</i>) for finishing male calves A R Aghashahi & A Nikkhah
115	Inclusion of varying levels of papaya (<i>Carica Papaya</i>) pomace in concentrate mixtures on nutrient utilization in native male buffaloes D S Rao, A Ramesh & M Parthasarthy
116	Comparative digestive ability and microbial population of Sistani (bos indicus) and Holstein (bos taurus) cattle fed different roughage diets H Mansouri, A Nikkhah, M Rezaeian, M Moradi & S A Mirhadi
117	The effects of processed whole crop wheat, maize silage and supplement type to whole crop wheat on the performance of dairy cows <i>M A Jackson, L A Sinclair, R Readman & J A Huntington</i>
118	Ruminal and intestinal protein disappearance of some tropical (Iranian) feeds used in dairy cow diets estimated by the mobile nylon bag technique <i>M Danesh Mesgaran</i>
119	Supplementation of finishing Nellore steers during dry season using byproducts A A Souza, C Boin, A J Lourenco, M Q Manella & L Suguisawa
120	Effect of energy source and supplementation pattern on feed intake and microbial-N supply in dual purpose cows (bos indicus x B. taurus) J C Ordóñez Tercero, L Ramírex Avilés, C Aguilar Perez & C A Sandoval-Castro
121	Concentrate restriction and its substitution by liquid whey in feeding of Holstein steers A R Bayat, R Valizadeh & A A Naserian

CATTLE NUTRITION

122	Effect of 9, 10-Anthraquinone on rumen methane production as studied <i>in vitro</i> and <i>in vivo</i> V Fievez, B Vlaeminck, W Steinberg, I Immig & D Demeyer
123	Effect of imbalance between energy and nitrogen supplies on microbial protein synthesis in growing double- muscled Belgian Blue bulls D Valkeners, Y Beckers, F Piron & A Thewis
124	Winter feeding regimes for 16-22 month old red deer stags and hinds

D G Chapple, D W Deakin & M H Davies

LACTATION

125	Production response to increased calcium salts of palm fatty acids in dairy cows T Goodman, N Gardner, C Lord, A Nickson & J Long
126	The effect of maturity of maize silage at harvest on the performance of lactating dairy cows offered three contrasting grass silages T W J Keady, C S Mayne & D J Kilpatrick
127	The response to concentrate supplementation of dairy cows grazing late summer/autumn grass C P Ferris & C S Mayne
128	Effect of incremental replacement of cereal grain with sugar beet feed on the lactational performance of high yielding cows offered maize silage based diets <i>R H Phipps, A K Jones, D E Beever & M W Witt</i>
129	The effects of <i>Saccharomyces cerevisiae</i> on feed intake, milk yield and composition in lactating Holstein cows <i>M Rezaeian</i>
130	Effect of season and parity on the milk production of Iranian Holstein cows A A Naserian & G Alavi
131	A feasibility study on the automatic recording of condition score in dairy cows M P Coffey, T B Mottram & N McFarlane
132	The effect of intravenous infusion of glucose on ethanol stability of milk in Holstein dairy cows S S Sobhani, R Valizadeh & A A Naserian
133	Environmental constraints in habitat use by free-ranging beef-cattle in the Natural Park of Gorbeia (Basque Country) N Mandaluniz & L M Oregui
134	A decision support system to evaluate the pollution potential of diets for dairy cows E Kebreab, J A N Mills, L A Crompton, J Dijkstra & J France
135	The Mitscherlich equation: an alternative to linear models of methane emissions from cattle JAN Mills, E Kebreab, LA Crompton & J France

GENETICS

136	Estimation of the effects of some environmental factors and genetic parameters of linear type traits in
	Holstein cows of Iran
	A Toosi & F Eftekhari
137	Possibility of reducing milk recording and sampling in Holstein dairy cattle of Iran
	A Ayatollahi-Mehrdjardy, M Moradi-Shahrbabak, A Nikkhah & A Moghimy
138	An estimate of heritability of clinical tail biting on a commerical pig breeding farm
	K Breuer, M E M Sutcliffe, J T Mercer, K A Rance, N E O'Connell, I A Sneddon, S A Edwards
139	Multivariate REML estimates of genetic parameters of monthly test day milk production traits in first parity
	Iranian Holstein cows with the use of a repeatability test day model
	H Farhangfar, P Rowlinson & M B Willis
140	Genetic variation within and between five Iranian sheep populations using microsatellite markers
	M H Banabazi, S Esmaeelkhanian, S R Miraei Ashtiani & M Moradi Shahrbabak
141	Relationships among udder type traits and milk yield of Iranian Holstein-Friesian cattle
	M R Sanjabi, M G Govindaiah & M M Moeini
142	Ultrasonography as a predicting tool for carcass traits of young Nellore crossbred bulls in a feedlot
	system
	L Suguisawa, H N Oliveira, W R S Mattos, A A Souza, M D B Arrigoni & A C Silveira
143	Timing of ultrasonic scanning for Welsh Mountain rams
	T C Pritchard & I Ap Dewi
144	The use of 17 RAPD primers in some of Iranian sheep breeds
	M Tahmoorespur, M R Nassiry & A Mohammady
145	Evaluation genetic parameters for weight at different ages in Baluchi breed of sheep
	M Hosseinpour Mashhadi, F Eftekhari Shahroudi & R Valizadeh
146	Evaluation of the lamb and feed-lot performances of three crossbred and one purebred genotypes of
	Iranian fat-tailed sheep
	S R Miraei-Ashtiani, A R Noshary & M Moradi Shahrbabak
147	Inbreeding and its effects on some economic traits in Raeini cashmere goats
	M Moradi-Shaharbabak & A Mohammadi, S R Miraei-Ashtiani
148	Differences in mammary gland weight and litter performance between Large White sows selected for
	different traits S C Whitehead, H M Miller & P C Penny

FEED CHARACTERISATION

149	The use of fresh or thawed rumen fluid containing glycerol or particle associated microbes to estimate <i>in vitro</i> degradation of feeds <i>R Mohamed, A S Chaudhry and P Rowlinson</i>
150	The relationship between diet and the chemical composition of sheep faeces M Afdal, D I Givens, C Rymer, E Owen & F Mould
151	Relationship between rumen odd and branched chain fatty acids and fermentation characteristics as studied in vitro B Vlaeminck, V Fievez, H van Laar & D Demeyer
152	Prediction of chemical composition on maize silage by near infrared reflectance spectroscopy in Uruguay D Cozzolino & A Fassio
153	The use of near infrared reflectance spectroscopy (NIRS) for the prediction of the digestible energy content of barley for growing pigs <i>M E E McCann, K J McCracken & R E Agnew</i>
154	Determination of dry matter (DM) and nitrogen (N) degradability in forages by near infrared reflectance spectroscopy (NIRS) C Cajarville, J P Repetto, A Curbelo, C Soto & D Cozzolino
155	The possible use of n-alkanes, long-chain fatty alcohols and long-chain fatty acids as markers in studies of the botanical composition of the diet of free-ranging herbivores <i>HAMAli, R W Mayes, B L Hector & E R Orskov</i>
156	Prediction of <i>in vivo</i> organic matter apparent digestibility of grass silage by means of the gas/production technique A Garcia-Rodriguez, A Igarzabal, L M Orequi & G Flores
157	The prediction of <i>in vivo</i> methane production and animal performance from the <i>in vitro</i> gas production technique A Bortolozzo, D K Lovett, S Lovell, L Stack, F P O'Mara
158	Seasonal variation in <i>in vitro</i> methane production of two perennial ryegrass cultivars D K Lovett, A Bortolozzo, D McGilloway & F P O'Mara
159	Stable carbon isotape analysis of faecal and blood samples of sheep in relation to the diet A Balcaen, E Claeys, V Fievez, P Boeckx, O Van Cleemput & S De Smet
160	Microbial protein kinetics for sheep fed with three different hays using 15 as marker I C S Bueno, S L S Cabral Filho, C Longo & A L Abdalla
161	Voluntary feed intake, apparent digestibilities and nutritive values in ponies given <i>ad libitum</i> access to complete pelleted diets made from wheat straw and unmolassed sugar beet pulp <i>J J Hyslop</i>
162	In vitro methane production of different cultivars of perennial ryegrass D K Lovett, D McGilloway, A Bortolozzo & F P O'Mara
163	In vitro methane production as influenced by harvest date and level of nitrogen application D K Lovett, A Bortolozzo, P O'Kiely, P Conaghan, & F P O'Mara
164	Digestible dry matter and protein of lucerne hay or lucerne silage treated with sulphuric acid using mobile nylon bag technique M H Delavar, M Danesh Mesgaran

FEED CHARACTERISATION

165	Effect of urea-whey treatment on the chemical composition and digestibility of wheat straw <i>H Fazaeli, M V Tokasi & S Arjmand</i>
166	Effect of fungal treatment on the chemical composition, <i>in vitro</i> digestibility and <i>in sacco</i> degradability of wheat straw
	H Fazaeli, A Azizi, Z A M Jelan & S A Mirhadi
167	Structural characterization of low lignin (AC Assinobia) and high legnin (Normal) of oat hulls by Diffuse- Reflectance Fourier Transform Vibrational Infrared Spectroscopic analysis <i>P Yu, J J McKinnon & D A Christensen</i>
168	Study on chemical treatment of wheat straw with Norea alkali <i>R Valizadeh</i>
169	Lipolysis and biohydrogenation of linoleic and linolenic acid <i>in vitro</i> : comparison of linseed products and grass TT Chow, V Fievez, K Raes, D Demeyer & S De Smet
170	In vitro gas production, digestibility and estimated energy value of grass/fodder tree silages J V Cardenas Medina, C A Sandoval-Castro, F J Solorio Sanchéz
171	Estimation of the nutritive value of silage from grass (Pennisetum purpureum) and forage tree mixtures J V Cardenas Medina, C A Sandoval-Castro & F J Solorio Sanchez
172	Ruminal N degradability of fresh, wilted and ensiled temperate forages C Cajarville, J D 'Alessandro, C Soto, A Curbelo, D Garin & J L Repetto
173	Chemical composition and <i>in vitro</i> dry matter digestibility of parasitic plants reflect that of indigenous browse trees O R Madibela, M Letso, B Makoba & O Seitshiro
174	Chemical composition of some feedstuffs in East Azerbaijan H Janmohammady, P Yasan, A Taghizadeh, D J Shoja & A Nikkhah
175	Nutritive evaluation of heat-treated cottonseed with <i>in vitro</i> gas production A R Foroughi, A A Naserian, R Valizadeh, M Danesh Mesgaran & A Mirhady
176	Changes in water soluble sugar contents during the day in Lucerne and Fescue cut in autumn J L Repetto, N Errandonea, A Britos, D Cozzolino & C Cajarville

POULTRY

177	Pinpointing the lowest protein diet for young male broilers B Dastar & A Golian
178	The effect of natural zeolite and bakery waste on performance and serum parameters of broiler chickens M R Kouhkan Nezhad, H Kermanshahi & F Eftekhari Shahroudi
179	Effect of dual feeding program and heat stress on broiler performance H Hossain Zadeh, A M Tahmasbi, Gh Moghadam & S Alijani
180	The effect of severity and duration of early feed restriction on feed intake, body weight gain and feed conversion ratio of male broiler chickens <i>H Jahanian Najafabadi, A Golian & F Eftekhari Shahroudi</i>
181	The effect of severity and duration of early feed restriction on body weight gain and abdominal fat of male broiler chickens <i>H Jahanian Najafabadi, A Golian & F Eftekhari Shahroudi</i>
182	Egg selenium concentrations in breeder hens fed Na-selenite or Sel-plex® supplemented diets S Kenyon & P Spring
183	Performance and carcass measures of broilers maintained on diets containing Biomin (a symbiotic natural growth promoter) under tropical conditions E A Iyayi & C Ezeokeke
184	Steroid hormones concentration of the preovulatory ovarian follicles of the goose <i>P Pasciak & D Wojtysiak</i>
185	Effect of different levels of bacterial probiotic on broilers performance M R Abdollahi, A Kamyab, A Bazzazzadekan, A Nik-Khah & A Z Shahneh

SHEEP NUTRITION

186	Effect of CRYSTALYX®on the performance of breeding ewes during first three months of pregnancy while grazing grass outdoors A S Chaudhry, C J Lister & P Rowlinson
187	Effects of time spent on pasture and the characteristics of the concentrate on milk yield, milk composition and body reserves in the Latxa dairy ewe A Garcia-Rodrigues & LM Oregui
188	Intake and apparent digestibility of <i>Leucaena Leucocephala</i> for Santa Inês sheep diet <i>C Longo, A A M de A Oliveira, S P Gobbo, I C S Bueno & A L Abdalla</i>
189	The effects of nutrition and age on characteristics of fibers Raeini Cashmere goat S A Rafat, D Shodja & H Karimi
190	The effect of forage maize hybrid type on <i>in vivo</i> and <i>in vitro</i> dry matter digestibility A Kamalak O Ozay & H Gizir
191	Tannin bioassay using semi-automated and manual gas production techniques for Brazilian browses S L S Cabral Filho, I C S Bueno, E F Nozella, A L Abdalla & D M S S Vitti
192	Voluntary herbage intake and diet selection in Scottish-Blackface ewes suckling twin lambs and grazing perennial ryegrass/white clover swards with or without protein supplementation J J Hyslop, F A Kennedy, H F Adamson & R Keatinge

SHEEP NUTRITION

193	Nutrient digestibility of alfalfa at different growth stages on sheep and goat M M Moeini, M Souri, F Hozabri & M R Sanjabi
194	Study on phosphorus metabolism in growing sheep fed different sources of calcium by using the isotope dilution technique
	R S Dias, A P Roque, V F Nascimento, L A Castilho, M R S R Peçanha & D M S S Vitti
195	The effect of dietary molybdenum or iron on copper status and trace element accumulation in the pituitary and ovary of growing lambs
	C L Williams, S Haywood, M Loughran, R G Wilkinson, D V Illingworth & A M Mackenzie
196	A phosphorus metabolism model for sheep fed various levels of calcium
	D M S S Vitti, E Kebreab, J B Lopes, A L Abdalla, L M Salviano, L A Crompton & J France
197	The effects of mineral block ingredients when offered to ewes in late pregnancy on Immunoglobulin G (IgG) absorption in their lambs
	T M Boland, P O Brophy, J J Callan, P J Quinn, P Nowakowski & T F Crosby
198	The intake and digestibility in Raini male goats fed different ratios of effective rumen degradable nitrogen: sulphur
	Y Rouzbehan, K Rezayazdi & M Zahedifar
199	The influence of different levels of fish meal on the performance and carcass characteristics of Raini goat Y Rouzbehan, M Taghizade & K Rezayazdi

ANIMAL PRODUCTS

200	Determination of colour on pork muscles by near infrared reflectance spectroscopy D Cozzolino, N Barlocco, A Vadell, G Galietta & F Ballesteros
201	Influence of grass silage fermentation and concentrate composition on the appearance and sensory characteristics of bovine <i>M. longissimus dorsi</i>
	A P Moloney, D McGilloway, M T Mooney, M Vidal & D J Troy
202	Dietary manipulation of the polyunsaturated to saturated and n-6:n-3 fatty acid ratios in lamb S L Cooper, L A Sinclair, R G Wilkinson, M Enser & J D Wood
203	Increasing human intake of selenium by supplementing food animals with organic selenium KA Jacques & S Kenyon
204	Relationship between linoleic and α-linolenic acids in cooked meat odour development M M Campo, S J Elmore, G R Nute, J D Wood, D S Mottram & M Enser
205	Effect of buffer feeding on milk fat composition from dairy cows offered a high-lipid ration at pasture E Magowan, A M Fearon, D C Patterson & J A M Beattie
206	The cholesterol level in <i>M. Longissimus dorsi</i> of pigs according to the type of cross and different body weight at slaughter <i>P Pasciak, W Migdal & D Wojtysiak</i>

INVITED PAPERS

ANIMAL SCIENCE AND GLOBALISATION

207	Disease and biosecurity
	A D James, University of Reading, UK

208 Knowledge transfer and dissemination: insights from the dairy sector in the UK and India *C J Garforth, University of Reading, UK*

ROLES FOR BIOTECHNOLOGY - OLD AND NEW

- 209 Sustainable breeding objectives in developing countries *E P Cunningham, Trinity College, Dublin, Ireland*
- 210 GM technology a tool to benefit livestock production in less-developed and developed countries A Cockburn, Monsanto UK Ltd, Cambridge & R H Phipps, University of Reading, UK
- 212 GM technologies opportunities and threats of applying GM technology in less developed and developed countries *A Bennett, The Syngenta Foundation, Switzerland*

FUNCTIONAL FOODS - FACT OR FAD? (1)

- 213 Introduction to functional foods C A Adams, Kemin Europa NV, Belgium
- 214 Animal fats and human health *A M Salter, University of Nottingham, UK*
- 215 Enhancing the selenium content of food products from animals *B R Cottrill & D I Givens, Nutritional Sciences Research Unit, School of Agriculture, University of Reading, UK*

COMPANION ANIMALS ISAE/BSAS

- 216 Genetic disorders in dogs J Sampson, The Kennel Club, London, UK
- 217 Non-domestic animals as pets J K Kirkwood, Universities Federation for Animal Welfare, Wheathampstead, UK

FUNCTIONAL FOODS (2)

- 218 Cow's milk components with anti-cancer potential D L Palmquist, The Ohio State University, USA & P W Parodi, Dairy Research and Development Corporation, Melbourne, Australia
- 219 Dietary manipulation of conjugated linoleic acid in ruminant products *A L Lock, Cornell University, USA, P C Garnsworthy, University of Nottingham UK, B A Corl & D E Bauman, Cornell University, USA*

NUTRITION AND ENVIRONMENTAL IMPACT

221 Manipulating the diet to reduce environmental pollution from pigs *A J A Aarnink, G C M Bakker, M C J Smits & M W A Verstegan, University of Wageningen, The Netherlands*

NEW PERSPECTIVES ON PMWS AND PDNS

- 222 PCV2/PMWS field studies, experimental infections and immunological parameters *G M Allan, DARDNI, Belfast, UK F McNeilly, B Meehan, S Krakowka, J Ellis, H Nauwynck, A Botner, K McCullough & C Charreyre*
- 223 Clinical presentation, epidemiological findings, diagnosis, immunity, prevention and control of postweaning multisystemic wasting syndrome (PMWS) J Segales & M Domingo, CRESA - Autonoma University of Barcelona, Spain
- 224 Management system to control and minimise effect caused by post-weaning multi systemic wasitng syndrome and porcine dermatitis and nephropathy syndrome *R D Brice, Production Director, Rattlerow Farms, Pig Breeding Development Ltd., Stradbrooke, Eve,*
 - UK

AQUACULTURE

- 225 Genetic improvement programmes for aquaculture species B Gjerde AKVAFORSK, Norway & B Villanenuva, SAC
- 226 Aquaculture nutrition a brief and topical review *K Jauncey, Institute of Aquaculture, University of Stirling*
- 227 Health management in aquaculture *P Southgate, Fish Vet Group, Inverness*

NUTRITION FOR PRO-ACTIVE HEALTH

- 228 Microbial community analysis and its application in gastrointestinal health J H A Apajalahti, Danisco Innovation, Kantvik, Finland
- 229 Gut morphology and nutritional management *R Slade & H M Miller, University of Leeds*
- 231 Dietary carbohydrates and management of the gut environment in pigs *K E B Knudsen, H N Laerke, M S Hedemann, B B Jensen & C F Hansen DIAS, Foulum, Tjele, Denmark*

Re-connecting the Food Chain $\,$ - linking farmers, scientists and consumers

WHAT THE PUBLIC WANTS FROM AGRICULTURE

- 232 What the public want from agriculture: Introduction *R Ellis, Dept of Agriculture, University of Reading, UK*
- 233 The public and agriculture: The consumer perspective S McKechnie, Consumer's Association, London, UK
- 235 The importance of communication in meeting consumer demands D Chamberlain, Managing Director - Chamberlain, Peterborough, UK

INTEGRATED APPROACH TO FUNCTIONAL TRAITS: COMBINING PHYSIOLOGY AND GENETICS

236 Physiological genetics, its relationship with classical quantitative and molecular genetics *P Lovendahl, Danish Institute of Agric Scs, Research Centre Foulum, Denmark*

IT IS NOT ABOUT MUCK OR MAGIC - PUTTING THE SCIENCE INTO ORGANIC LIVESTOCK PRODUCTION ADAS/BSAS

237	Organic livestock production in the hills and uplands
	R Keatinge, ADAS Redesdale, Newcastle Upon Tyne,UK
238	Animal health and welfare in organic livestock production - a review of the current situation M Hovi, Vet Epidemiology & Economics Research Unit, University of Reading, UK
239	Control of endoparasites in organic livestock systems D Gray, SAC, Aberdeen, UK
240	Managing manures in organic systems

RSPCA/BSAS Award winner

241 Emerging animal welfare standards: science, values and public trust D Fraser, University of British Columbia, Canada

M A Shepherd, ADAS Gleadthorpe, Mansfield, UK

Invited Papers

(not available at time of Proceedings going to press)

ANIMAL SCIENCE AND GLOBALISATION

243 The Livestock revolution/implications – an African view
D. Miano Mwangi¹ and A. Omore ^{1,2}
¹Kenya Agricultural Research Institute P.O. Box 30148 Nairobi, Kenya
² International Livestock Research Institute P.O. Box 30709 Nairobi, Kenya

NUTRITION AND ENVIRONMENTAL IMPACT

- 245 Options for change Reducing environmental emissions from livestock production. S.C. Jarvis, IGER, North Wyke Research Station, Okehampton, UK
- 246 Reducing methane production from ruminants a practical approach *F.P. O'Mara and D.K. Lovett, University College Dublin, Ireland.*

AQUACULTURE

248 The Industry, European and Global aspects *K Rana and K Jauncey, Institute of Aquaculture, University of Stirling, Stirling, UK*

RE-CONNECTING THE FOOD CHAIN - LINKING FARMERS, SCIENTISTS AND CONSUMERS Session 1: What the Public Wants from Agriculture

249 What the public wants from agriculture: The government view *M Segal, Head Of Livestock Strategy, DEFRA*