

*British Society  
of Animal Science  
Winter Meeting*

*Programme  
and  
Summaries*

*Spa Complex  
Scarborough  
20-22 March 1995*

*These summaries have been collected together as a service for conference delegates: They have not been checked or edited and the Society can accept no responsibility for their accuracy. Please check with the author before using any of the information.*

**BSAS WINTER MEETING 1995  
PROGRAMME**

<b>DAY</b>	<b>TIME</b>	<b>THEATRE SESSIONS</b>			<b>POSTER SESSIONS</b>
Monday 20 March	1400	SPA THEATRE <b>The President</b>	REGENCY ROOM	MUSIC ROOM	<b>GRAND HALL</b> Sessions open 1410 Authors in attendance 1410-1520  <b>Sheep Nutrition</b>  <b>Sheep &amp; Goats</b>  <b>Fibre</b>  <b>Deer, Camels &amp; Campanion Animals</b>
	1410	<b>Milk Production I</b>	<b>Pig Genetics &amp; Meat Quality</b>		
	1550	TEA			
	1610	<b>Dairy Cow Reproduction</b>	<b>Ruminant Nutrition</b>		
	1900	<b>SCARBOROUGH TOWN COUNCIL RECEPTION</b>			
	1930	<b>CONFERENCE DINNER 1995</b>			
Tuesday 21 March	0900	<b>Technology Transfer - PRESIDENT'S SESSION</b>			<b>VITA DOME</b> Session opens 0900 Authors in attendance 0900-1020 Discussion 1420-1520  <b>Techniques &amp; Methods</b>
	1020	COFFEE			
	1040	<b>Silage</b>	<b>Pig Behaviour</b>		
	1230	LUNCH			<b>GRAND HALL</b> Sessions open 0900 Authors in attendance 1040-1140  <b>Genetics &amp; Cattle Improvement</b>  <b>Ruminant Reproduction</b>  Sessions open 0900 Authors in attendance 1615-1715  <b>Cattle Nutrition &amp; Production</b>  <b>Silage</b>
	1340	<b>Milk Production II</b>	<b>Pig Nutrition</b>		
	1520	TEA			
	1540	<b>Transport of Animals</b>	<b>Sheep Genetics</b>	<b>Poultry</b>	
	1745	<b>AGM</b>			
	1945	DINNER			
Wednesday 22 March	0900	<b>HAMMOND MEMORIAL LECTURE</b>			<b>GRAND HALL</b> Session opens 0900 Authors in attendance 1030-1130  <b>Pigs</b>
	1010	COFFEE			
	1030	<b>Ruminant Physiology</b>	<b>Diet Selection*</b>		
	1230	LUNCH			<b>VITA DOME</b> Session opens 0900 Authors in attendance 1030-1130  <b>Pig Welfare &amp; Ruminant Welfare</b>
	1330	<b>Beef &amp; Sheep Production</b>	<i>WPSA Spring Meeting</i>		
	1530	BSAS Meeting Closes			
	1700	<i>WPSA Gordon Lecture</i>			
	1800 2000	<i>Sherry Reception</i> <b>WPSA UK BRANCH DINNER</b>			
Thursday 23 March	<b>WPSA Spring Meeting - Mini Symposium and Poster Session</b>			<i>*joint WPSA/BSAS Session</i>	

Monday 20 March 1995

Theatre Session  
Spa Theatre

### MILK PRODUCTION I

Chairman - Prof D E Beever

**14:00 Opening Remarks by the President - Dr S A Papasolomontos**

- 14:10 1 The effect of increasing starch intake and source in supplements fed in a complete diet to dairy cows on total dry matter intake, milk yield, milk composition and metabolic profiles and fatty acid content of milk fat when fed complete diet or 3 times a day.  
R J Mansbridge, J S Blake & H H Spechter
- 14:30 2 The influence of source of starch in concentrates on the performance of dairy cows  
M A Assad, P Rowlinson & S Marsden
- 14:50 3 The effect of supplementing grass/clover silage with barley grain or fodderbeet on dairy cow performance and nitrogen efficiency  
A Hameleers, K Haytink & D J Roberts
- 15:10 4 Digestibility and nitrogen balance in dairy cows given diets of grass silage and whole crop wheat  
J D Sutton, A L Abdalla, R H Phipps, S B Cammell & D J Humphries
- 15:30 5 Relative net energy values of grass silage and maize silage for dairy cows  
F P O'Mara

15:50 *TEA*

### DAIRY COW REPRODUCTION

Chairman - Dr S B Drew

- 16:10 6 Control of ovarian function in cattle  
Dr R Webb, J G Gongg, C G Gutierrez, D G Armstrong & B K Campbell  
Roslin Institute, Edinburgh
- 16:40 7 Stress and ovarian function in cattle  
Dr H Dobson, University of Liverpool
- 17:10 8 Embryo mortality and its prevention  
Prof A R Peters, Royal Veterinary College, Potters Bar
- 18:00 Session Ends

19:00 **SCARBOROUGH TOWN COUNCIL RECEPTION**

19:30 **CONFERENCE DINNER 1995**

**PIG GENETICS & MEAT QUALITY**

**Chairman - Dr J P Chadwick**

- 14:00 See opposite page
- 14:10 9 Genetic and phenotypic relationships between performance test and reproduction traits in pigs selected for components of efficient lean growth  
J C Kerr & N D Cameron
- 14:30 10 Determination of fatty acid composition of pig fat by near infrared reflectance spectroscopy  
M S Redshaw, J Wiseman, L Probert & D J A Cole
- 14:50 11 The influence of rate of lean and fat tissue development on pork eating quality  
P J Blanchard, J P Chadwick, C C Warkup, M Ellis & G Deans
- 15:10 12 Rate and site of fat deposition in pigs selected for components of efficient lean growth rate  
N D Cameron
- 15:30 13 Report of the 1994 Braude Scholarship to the British Society of Animal Science - improving reproductive performance in pigs  
J C Kerr

15:50 TEA

**RUMINANT NUTRITION**

**Chairman - Dr J J Robinson**

- 16:10 14 The effect of sample preparation and incubation sequence on dry matter disappearance of fresh grass *in situ*  
J A Huntington & D I Givens
- 16:30 15 The ability of sheep to modify their feeding behaviour in order to counteract challenges to their rumen environment  
S D B Cooper, I Kyriazakis, D H Anderson & J D Oldham
- 16:50 16 Estimation of food intake by sheep using blood assay for lithium content following ingestion of lithium labelled food  
J E Vipond, G Horgan & D Anderson
- 17:10 17 Prediction of methane production by sheep from a range of grass silage based diets  
A R Moss & D I Givens
- 17:30 18 Variations in the urinary excretion of purine derivatives and creatinine in Holstein/Friesian dairy cows  
K J Shingfield, N W Offer & A M Sword

17:50 Session Ends

19:00 **SCARBOROUGH TOWN COUNCIL RECEPTION**

19:30 **CONFERENCE DINNER 1995**

**TECHNOLOGY TRANSFER - President's Session**

**Chairman - Dr S A Papasolomontos**

09:00 19 Technology Transfer - opportunities, possibilities and limitations  
Prof B Heap, BBSRC Brabraham Institute

10:10 *COFFEE*

**SILAGE**

**Chairman - Prof M Gill**

10:40 20 Prediction of silage intake by cattle  
R W J Steen, F J Gordon, C S Mayne, R E Agnew, E F Unsworth, D J Kilpatrick, R J Barnes,  
M G Porter & C J Pippard

11:00 21 An examination of possible interactions between silage type and concentrate composition on the  
intake characteristics of grass silage offered to growing cattle and dairy cows  
C S Mayne, R Agnew, D C Patterson, R W J Steen, F J Gordon, D J Kilpatrick &  
E F Unsworth

11:20 22 Validation of advisory models for the prediction of voluntary intake of grass silage by lambs and  
dairy cows  
N W Offer, C Thomas & R J Dewhurst

11:40 23 The effects of level of nitrogen fertiliser application to silage swards on subsequent silage  
composition, intake and animal performance of lactating dairy cattle  
T W J Keady, J J Murphy & S Fitzgerald

12:00 24 Effect of stage of maturity of grass and period of ensilage on milk production with grass silage-  
based diets  
A Cushnahan, C S Mayne & E A Goodall

12:30 *LUNCH*

**MILK PRODUCTION II**

**Chairman - Dr P Rowlinson**

13:40 25 Effect of sodium and sulphur fertilizers on dairy cow production  
C J C Phillips, J Avezinius & P C Chiy

14:00 26 The effect of sward surface height on grazing behaviour by lactating Hotstein-Friesian cows  
M J Gibb, A J Rook, C A Huckle & R Nuthall

14:20 27 Effect of restricting suckling to once daily in *Bos taurus* x *Bos indicus* dairy cattle on milk  
production and reproduction  
J K Margerison, T R Preston & C J C Phillips

14:40 28 The effects of using a bacterial inoculant with unwilted and wilted grass silages on performance  
and nutrient utilisation by dairy cattle  
T Yan, D C Patterson, F J Gordon & M G Porter

15:00 29 The effect of nutrition during the dry period on the onset of ovarian activity in the subsequent  
lactation in dairy cows  
P J H Ball, E E A McEwan, J M Moorby & S Marsden

15:20 *TEA*

09:00 **PRESIDENT'S SESSION - See opposite page**

10:10 *COFFEE*

**PIG BEHAVIOUR**

**Chairman - Dr P H Simmins**

- 10:40 30 The effect of grouping time and gonadotrophin treatment on lactational oestrus in multisuckled sows  
S A Edwards, K Gall, M Shanks & H Hamilton
- 11:00 31 The effects of food level on general activity and aggression in dynamic groups of 30 sows  
H A M Spoolder, J A Burbidge, A B Lawrence, P H Simmins & S A Edwards
- 11:20 32 The effect of providing a high fibre diet on foraging behaviour of outdoor sows and consequent pasture damage  
J P Braund, S A Edwards, I Riddoch, L Buckner & J Roden
- 11:40 33 The effect of giving the food allowance in one, two or three meals per day on the post-feeding behaviour of pigs  
C A Morgan & A B Lawrence
- 12:00 34 A comparison of two genotypes of finishing pig housed in outdoor paddocks, straw yards and fully-slatted pens 1. performance  
J H Guy, P Rowlinson & J P Chadwick
- 12:20 35 A comparison of two genotypes of finishing pig housed in outdoor paddocks, straw yards and fully-slatted pens 2. welfare  
J H Guy, P Rowlinson & J P Chadwick

12:40 *LUNCH*

**PIG NUTRITION**

**Chairman - Dr P J Fullarton**

- 13:40 36 Least cost diets to reduce nitrogen excretion by growing and finishing pigs  
R M Kay & P A Lee
- 14:00 37 Manipulating dietary crude protein to reduce nitrogen excreted by pigs  
P A Lee, R M Kay, P J Fullarton, A W R Cullin & S Jagger
- 14:20 38 The effect of altering dietary cystine and methionine levels at similar ratios to lysine on the requirements for sulphur amino acids in early-weaned pigs  
P H Simmins, J C Bodin, A Kies & P E V Williams
- 14:40 39 Effect of inclusion rate and withdraw of full-fat rapeseed on the performance and carcass fatty acid profile of finishing pigs  
B P Gill, S McCone, G E Onibi, S Peatfield & K Gall
- 15:00 40 Phosphorus equivalence of *Aspergillus niger* phytase for growing pigs  
N Khan & D J A Cole

15:20 *TEA*

Tuesday 21 March 1995

Theatre Session  
Spa Theatre

**TRANSPORT OF ANIMALS**

**Chairman - Prof D M Broom**

- 15:40 Introduction - Prof D M Broom
- 15:50 41 Methods for reducing stress during handling and transport of livestock  
Dr T Grandin, Colorado State University, USA
- 16:15 42 Taking the stress out of transport - indices of physiological stress in transit  
Dr M Mitchell, Roslin Institute, Edinburgh
- 16:40 43 Effects of transport on slaughter weight lambs  
Dr T Knowles, University of Bristol

*POSTERS - Outside Theatre*

- 170 *Behaviour of pigs and sheep during road transport*  
*R H Bradshaw, S J G Hall & D M Broom*
- 171 *Effect of space allowance during transport on the behavioural and physiological responses of sheep*  
*M S Cockram, J E Kent, N K Waren, R E Jackson, G M Muwanga, S Prytherch & P J Goddard*
- 17:30 Session Ends

**18:00 AGM**

1945 *DINNER*

Tuesday 21 March 1995

Theatre Session  
Regency Room

### SHEEP GENETICS

Chairman - Dr N Wray

- 15:40 44 Predicted lamb carcass component changes from using different selection indexes and endpoints  
G E Pollott
- 16:00 45 The effect of genotype on lamb carcass characteristics  
S Johnston & R W J Steen
- 16:20 46 Carcass characteristics of extensively reared Blackface lambs, sired by genetically lean and fat rams  
J Conington, S C Bishop, A Waterhouse and G Simm
- 16:40 47 Variation in progeny performance of prolific ewes of extreme phenotype  
Ap Dewi, J B Owen, R F E Axford & J P Hanrahan
- 17:00 48 Genetic parameters and response to selection for pre-weaning growth in Suffolk and Texel Sheep  
J P Hanrahan & I W Purvis

Theatre Session  
Music Room

### POULTRY

Chairman - Dr J J Wiseman

- 15:40 49 Effects of high levels of vitamin E Supplementation in heat stressed laying hens  
S Bollengier, G Uzu, P E V Williams & C C Whitehead
- 16:00 50 The effect of increasing inclusion levels of  $\beta$ -glucanase on the feeding of hulled and hullless barley fractions to chickens  
S T Petersen, J Wiseman & M Bedford
- 16:20 51 Variance component estimates and genetic trends in a broiler breeding dam line using animal model methods  
A Morris & G E Pollott
- 16:40 52 Analysis of meat and reproductive traits in a commercial sire broiler line  
J H Catterall & G E Pollott

*POSTER - Inside Theatre*

- 172 *Effect of phytase supplementation of diets containing rice bran on growth performance and bone characteristics in broiler chickens*  
M A Aboosadi, J R Scaife, I Murray & M Bedford

17:00 Session Ends

18:00 **AGM**

19:45 *DINNER*



**SIR JOHN HAMMOND MEMORIAL LECTURE**

**Chairman - Dr S A Papolomontos**

09:00 53 Sustainability in Animal Production Systems  
Prof C R W Spedding

10:10 *COFFEE*

**RUMINANT PHYSIOLOGY**

**Chairman - Dr R G Rodway**

10:30 54 The effect of castration and ewe proximity on the behaviour, performance and meat quality of housed male lambs  
J M L Anderson & G M Webster

10:50 55 The effect of energy or protein supplementation on embryo survival rate in ewes  
M G Diskin & J P Hanrahan

11:10 56 Relationships between concentrations of steroids, IGF-1 and IGF binding protein during follicular development in the ewe  
M Khalid & W Haresign

11:30 57 The effect of type and number of FSH injections on superovulation in ewes  
M P Boland, P Kelly, T F Crosby & J F Roche

11:50 58 Heart rate responses and plasma cortisol and  $\beta$ -endorphin concentrations in ewes subjected to laparoscopy and its associated handling procedures  
W Haresign, R J Williams, M Khalid & R Rodway

12:30 *LUNCH*

**BEEF & SHEEP PRODUCTION**

**Chairman - Dr B Bastiman**

13:30 59 Comparison between growing fattening bulls finished at grass or indoors: Animal performances and carcass composition  
J L Hornick, S Gauthier, I Dufrasne, C Van Eenaeme & L Istasse

13:50 60 Comparative performance of two primiparous continental genotypes in a hill suckler herd: Calf performance  
D G Chapple, M H Davies, H F Grundy & R Keatinge

14:10 61 Effects of inoculant application to silage immediately prior to feeding to young growing cattle on silage intake, digestibility and rumen volatile fatty acid concentrations  
T W J Keady & R W J Steen

14:30 62 Organic and inorganic nutrient utilization by ewes zero-grazed on pasture of varying sodium concentration  
P C Chiy & C J C Phillips

14:50 63 Anthelmintic unresponsive diarrhoea in ewes and hogs  
N F Suttle & K Mclean

15:10 64 The effects of increased inputs to twin-bearing ewes within an extensive hill sheep system  
S E Pattinson & A Waterhouse

15:30 BSAS Meeting Closes

09:00 **HAMMOND MEMORIAL LECTURE- See opposite page**

10:10 *COFFEE*

**DIET SELECTION - Joint WPSA/BSAS Session**

**Prof J M Forbes**

10:30 65 Diet selection - what animals can and cannot be expected to do  
Dr I Kyriazakis, GABS, SAC Edinburgh

10:55 66 Difficulties implementing diet selection strategies on the farm  
Dr P Rose, Harper Adams Agricultural College

11:20 Discussion

**Diet Selection and Nutrition**

11:40 67 Different breeds of pigs have the same rules for using scarce food for protein growth  
G C Emmans & I Kyriazakis

12:00 68 An investigation into the potential use of a second order schedule of operant reinforcement for  
measuring feeding motivation in the pig  
J E L Day, M E Busch, I Kyriazakis & A B Lawrence

12:20 69 Diet selection of weaned piglets independently for crude protein and for lysine  
J A Dalby, J M Forbes, M A Varley & S Jagger

**POSTERS**

208 *Response of weaned pigs to choice feeding of complete diets*  
*P G Lawlor, P B Lynch, P J Caffrey, W D Henry & D Harrington*

209 *Diet selection by cattle offered a choice between clean or slurry contaminated swards: effects of  
application method and time since application*  
*J A Laws, A J Rook & B F Pain*

210 *Choice feeding to characterise genotypes in pigs*  
*J M F Wilson, O I Southwood & H A M van der Steen*

12:40 *LUNCH*

15:30 BSAS Meeting Closes

Session Opens 1410

SHEEP NUTRITION

- 70 The effect of dietary asynchrony on rumen nitrogen recycling in sheep  
P Holder, P J Buttery & P C Garnsworthy
- 71 The effect of supplementary mixtures of Tropical shrub legumes on nitrogen utilisation in sheep fed a low quality grass  
C J Powell, C E Lascano, D L Romney & M Gill
- 72 The effects of restricting concentrate intake to January born lambs at grass  
T Coll, P J Quinn & T F Crosby
- 73 The role of biotechnology in enhancing the digestion of forage cell walls by ruminants (Jerry Hughes Scholarship)  
E R Deaville
- 74 Effect of dietary energy concentrations during the peri-ovulatory period on the *in vivo* and *in vitro* development of fertilized sheep ova  
Al-Khozam, J J Robinson, T G McEvoy, R P Aitken, P A Findlay & I S Robertson
- 75 Effect of ammonia treatment on rate of adaptation of newly-housed store lambs to eating wheat straw  
A T Adesogan & E Owen
- 76 The effect of anchor weight and incubation sequence on *in situ* dry matter disappearance of hay, soyabean meal and fishmeal in sheep and cows  
J A Huntington & D I Givens
- 77 A comparison of supplementary feeding systems for twin bearing/rearing mule ewes during late pregnancy and early lactation  
B G Merrell, S P Marsh & B A Hedley
- 78 The performance of pregnant ewes and their progeny when fed grass maize or super pressed pulp silages in late pregnancy  
P F Maher, J V O'Doherty, P J Quinn & T F Crosby
- 79 The effect of ensiling molassed sugar beet pulp or formic acid with grass on the digestion and rumen fermentation patterns in sheep  
J V O'Doherty, J J Callan & T F Crosby
- 80 Effects of level of concentrate on the eating behaviour and predicted hourly release of nutrients in the rumen of sheep fed grass silage  
L A Sinclair & G C McQuiston
- 81 Effect of supplementing grass silage with fish meal on rumen fermentation and methane production by sheep  
A R Moss & D I Givens
- 82 The use of sheep to predict methane production by cattle fed grass silage based rations  
C J Newbold, A R Moss, G S Mollinson & C G Harbron
- 83 Effect of fish meal supplementation on body energy mobilization and milk production of ewes in negative energy balance  
C Castrillo, C Dapoza, C Rubio & J A Guada

Continued.....

Monday 20 March 1995

Poster Session

Grand Hall

Authors in attendance 1410-1520

Session Opens 1410

**SHEEP NUTRITION**

- 84 Effect of sward height and sheep breed on sward composition during summer grazing period  
A R Mantecón, E Jaramillo, P Frutos & P Lavin
- 85 Effect of supplementation level and sheep breed on hay intake and diet digestibility  
E González-Chabbarri, P Lavin & A R Mantecón
- 86 Digestive utilization during postweaning period in Churra lambs: Effect of previous level of milk intake and protein content in the diet  
T Manso, A R Mantecon, T Castro, M A Chaso & F J Giraldez
- 87 Influence of weaning on carcass, fatty acids composition and meat quality in intensive lamb production systems  
C Sanudo, I Sierra, J L Olleta, L Martin, M Campo, P Santaolaria, J D Wood & G Nute
- 88 Cut-and carry feeding of indigenous grass in Indonesian sheep production: effect of amount of grass offered and wilting on intake and yield of compost  
J C Tanner, E Owen, H M Winugroho & M Gill
- 89 Growth and meat quality assesement of entire and castrated Suffolk-cross male lambs on a traditional grass system  
J M L Anderson & G M Webster
- 90 A comparison of concentrate and silage-based finishing diets on the performance, carcass composition and meat quality of Suffolk-cross and Scottish Blackface lambs  
M I Mustafa & G M Webster
- 91 Digestion by sheep of diets containing different ratios of grass silage to partially-fried potato chips  
A I Mathers, J A Rooke & R Crawshaw
- 92 The effect of dietary protein and energy sources on ruminal accumulation of low molecular weight peptides in sheep  
M Mesgaran & D S Parker

Session Opens 1410

**SHEEP & GOATS**

- 93 Effect of type of supplement on goat milk production under grazing conditions  
P Frutos, J Lopez, P Lavin, P Diez & A R Mantecon
- 94 The effect of management history on oestrus cyclicity in mule ewes  
M E King, L M Mitchell, R P Aitken & J M Wallace
- 95 The effect of management history and time of mating on ovulation and lambing rates in mule ewes  
L M Mitchell, M E King, R P Aitken & J M Wallace
- 96 Timing parturition in intensively managed ewes  
L M Mitchell
- 97 Modelling responses to selection for resistance to gastrointestinal parasites in sheep  
S C Bishop & A D Campbell
- 98 Excess rumen degradable protein influences the rate of development and glucose metabolism of fertilized sheep ova  
O R Madibela, T G McEvoy, J J Robinson, P A Findlay, R P Aitken & I S Robertson

**FIBRE**

- 99 Initial responses to selection fibre value and fibre diameter in Cashmere goats  
S C Bishop & A J F Russel
- 100 Effect of protected methionine supplementation of the diet and genotype on growth, digestive characteristics and fibre yield in Cashmere Angora goats  
M Sourì, H Galbraith, J R Scaife & P E V Williams
- 101 The effects of nutrition on fibre characteristics and production in the Alpaca  
A J F Russel, H Redden & J W Kay
- 102 Tethering of grazing goats in Tanzania: effect of tethering for four or eight hours daily on intake and milk yield of Norwegian cross local goats grazing *Brachiaria* in the wet season  
D S C Sendalo, E Owen, L A Mtenga, D L Romney, P D Penning & R W Mayes
- 103 Plane of nutrition and the timing of the moult in Cashmere goats  
M Merchant & D J Riach
- 104 An investigation of the role of thyroid hormones in the control of secondary fibre growth and moult in Cashmere goats  
S M Rhind & S R McMillen

Monday 20 March 1995

Poster Session  
Grand Hall  
Authors in attendance 1410-1520

Session Opens 1410

DEER, CAMELS & CAMPANION ANIMALS

- 105 Fattening performance of dromedary camels fed finishing diet containing molassed dates supplemented with 0, 0.5 or 1.0% urea  
M B Aboul-Ela, G Al-Hadrami, D J McClelland, A A Nigm, A El-Dehna & F D Hovell
- 106 Effect of extended photoperiod on appetite, growth and reproductive endocrinology in red deer stag calves  
M H Davies, T J Parkinson, J A Douthwaite & D W Deakin
- 107 Effect of photoperiod manipulation and feed energy level on carcass composition and meat quality in red deer (*Cervus elaphus*)  
A V Fisher, M H Davies & G R Nute
- 108 The Application of an oral zinc tolerance test to compare the absorption of zinc from two inorganic and one chelated source in the dog.  
J A Lowe & J Wiseman

Tuesday 21 March 1995

Poster Session

Vita Dome

Authors in attendance 09:00-10:20

Discussion 14:20-15:20

Chairman - Dr J R Newbold

Session Opens 0900

### TECHNIQUES AND METHODS

- 109 Decreased methane production and altered fermentation in response to the addition of fumaric acid to the rumen simulation technique (Rusitec)  
S Lopez, C Valdes, C J Newbold & R J Wallace
- 110 Repeatability of *in vitro* digestibility assays of forages when using fresh, frozen or freeze-dried cow faeces instead of sheep rumen liquor as sources of micro-organisms  
S Akhter, E Owen, M K Theodorou, S L Tembo & E R Deaville
- 111 Measurement of the rate and extent of cell wall degradability in forages; a comparison of three methods  
E R Deaville & D I Givens
- 112 The nutritional and antinutritional characteristics of six browse species from Zimbabwe  
T Acamovic, E Garwe, C S Stewart & I M Duncan
- 113 The use of dairy cow faeces rather than rumen liquor in the gas pressure transducer technique for assessing digestion kinetics *in vitro*  
D M Harris, A Barlet & A T Chamberlain
- 114 The relationship between gas production from washed and unwashed feeds and *in situ* dry matter degradability of feeds  
D M Harris & A T Chamberlain
- 115 Relationships between *in vitro* gas production characteristics and composition of tree leaf fodders from Bolivia, West Africa and Colombia  
C D Wood, C Grillet, M Rosales & S Green
- 116 To test the repeatability of a gas production method for assessing the *in vitro* fermentation of forages using micro-organisms derived from a rumen simulation technique (Rusitec) or from sheep rumen liquor  
J H T Barbi, E Owen & M K Theodorou
- 117 Influence of feed processing on the *in vitro* fermentation profiles of ruminant feeds using the gas production technique.  
E R Deaville
- 118 A comparison between *in vitro* digestibility, *in situ* degradability and gas production techniques for predicting the *in vivo* digestibility of whole crop wheat  
A T Adesogan, D I Givens & E Owen
- 119 Effect of heat processing on the nutritive value of Mucuna Bean (*Mucuna sloanei*) for rats  
A S Chaudhry, G Egedege, A J F Webster & M A Kitcherside
- 120 Use of near infrared reflectance (NIR) spectroscopy to investigate the effect of polyethylene glycol (PEG) on changes in leucaena leucocephala and calliandra sp incubated *in vitro*  
S J Lister, R Sanderson, M S Dhanoa & E M Gill
- 121 Comparison of oven drying versus freeze drying on the analysis of non-starch polysaccharides in graminaceous and leguminous forages  
A C Longland, R D Pilgrim & I H Jones

**Tuesday 21 March 1995**

**Poster Session**

**Vita Dome**

**Authors in attendance 09:00-10:20**

**Discussion 14:20-15:20**

**Chairman - Dr J R Newbold**

**Session Opens 0900**

**TECHNIQUES & METHODS**

- 122 Indigestible dry matter as internal marker to estimate digestibility in grazing sheep  
M D Villalba, T Castro, A R Mantecón, T Manso, M Riesgo & I Salazar
- 123 The effects of ruminal and duodenal casein infusion on intake of red clover silage, milk production and microbial protein synthesis  
H Khalili, P Huhtanen, S Jaakkola & T Varvikko
- 124 Relationship between urinary purine derivative excretion and milk protein yield by dairy cows  
R J Dewhurst, R T Evans, V J Theobald, M A Neville, S Miles & A B McAllan
- 125 Contribution of dietary purine bases to duodenal digesta: effect of forage/concentrate ratio  
J F Perez, J Balcells, J A Guada & J C Surra



Tuesday 21 March 1995

Poster Session  
Grand Hall  
Authors in attendance 1040-1140

Session Opens 0900

**GENETICS & CATTLE IMPROVEMENT**

- 126 Comparison of the performance of two multiparous continental genotypes in a hill suckler herd  
K A Christensen, P Rowlinson, C J Seal & R Keatinge
- 127 Selecting terminal beef sires on their estimated breeding values for economic efficiency  
M E King & P J Broadbent
- 128 Genetic parameters for somatic cell count for three dairy breeds in the United Kingdom  
R Mrode, G J T Swanson & M S Winters
- 129 A comparison of the efficiency of the repeatability model on observed or transformed yields to a multi-variate analysis  
R Mrode & G J T Swanson
- 130 Accuracy of conversion of sire evaluations to UK predicted transmitting ability (PTA) equivalents (Holstein Friesian)  
M S Winters, G J T Swanson & R A Mrode
- 131 Genetic progress in the Lleyn group breeding scheme using a multitrait selection index  
G E Pollott & D R Guy
- 132 Inheritance and correlations of locomotion and linear type traits in Hosten-Friesian cattle  
D Boelling & G E Pollott

Session Opens 0900

**RUMINANT REPRODUCTION**

- 133 The development of a Markov chain model for the potential effects of embryo transfer on milk production in commercial dairy herds  
C M Yates, T Rehman & A T Chamberlain
- 134 An economic assessment of the impact of new reproductive technologies on commercial dairy and beef herds  
C M Yates, T Rehman & A T Chamberlain
- 135 A linear programme approach to optimise the use of new reproductive technologies in commercial dairy herds to maximise net returns  
C M Yates, T Rehman & A T Chamberlain
- 136 A spectrophotometric method for the assessment of vigour of ram semen  
Y J Ahangari, R F E Axford & I Ap Dewi
- 137 Characterisation of the oestrous cycles of maiden Simmental heifers and their response to superovulation  
S P Singh, P J Broadbent & J S M Hutchinson
- 138 An *in vitro* method using bovine granulosa cells for assaying the neutralising capacity of antibodies to pregnant mare's serum gonadotrophin  
M Kuran, J S M Hutchinson & P J Broadbent
- 139 Pregnancy diagnosis using bovine pregnancy-associated glycoprotein in purebred beef heifers mated at a first or second synchronised oestrus  
K D Sinclair, P J Broadbent, F E Gebbie, D F Dolman & J-F Beckers
- 140 Establishing twin pregnancies in cattle by embryo transfer  
K D Sinclair, P J Broadbent, D F Dolman, R G Watt & J S Mullan
- 141 Effects of Gonadotrophin releasing hormone agonist treatment on oestrous cycle length and superovulatory response in maiden heifers  
L M Birnie, P J Broadbent, J S M Hutchinson, R G Watt & D F Dolman

Session Opens 0900

**CATTLE NUTRITION & PRODUCTION**

- 142 Grassland management systems for suckler cows and progeny  
M J Drennan
- 143 Replacing concentrates with self help feed blocks in the winter rations of autumn calving suckler cows  
T L Powell & S P Marsh
- 144 A comparison of daily and alternate day feeding of a complete diet to dairy cows  
C J C Phillips & M I Rind
- 145 Dietary preference of heifers for grass or clover, with and without romensin slow-release anti-bloat boluses  
P D Penning, A J Parsons, R J Orr, A Harvey and N H Yarrow
- 146 Comparison of calorimetry and comparative slaughter for estimating energy retention and  $k_f$  by young steers  
R Sanderson, M S Dhanoa, C Thomas & D E Beever
- 147 Effects of tannic acid, ellagic acid, gallic acid and catechin on cellulose degradation by the rumen fungus *Neocallimastix frontalis* strain RE1  
S Muhammed, C S Stewart and T Acamovic
- 148 The effects of physical treatment of barley and rapeseed meal in dairy cows given grass silage  
P Huhtanen & T Heikkilä
- 149 Moist wheat distillers grains for grass silage fed beef cattle  
P Rowlinson, S P Marsh & W Taylor
- 150 Effect of restricted suckling patterns on milk yield, milk composition and calf growth  
C Sandoval & J D Leaver
- 151 Effect of level of concentrate feeding on udder volume and secretory efficiency in Holstein-Friesian heifers  
R J Dewhurst, R T Evans, V J Theobald, S Sharpe & A B McAllan
- 152 Alternative nutritional strategies to increase milk yield in dairy cows: a modelling approach  
J R Newbold
- 153 The effect of gossypol on the rumen fungi attachment and degradation of cellulose in culture  
Ismartoyo, C S Stewart, T Acamovic & A J Richardson
- 154 The effect of metabolisable protein supply at constant energy intake on the liveweight gain of bovines  
P N Johnson & E R Deaville
- 155 Development of feedingstuffs evaluation systems in Iran  
Y Rouzbehan, Y Chashnidel & A Nik-khah
- 156 An investigation of the effect of initial milk yield level on the response to sward height and concentrate supplementation in grazing dairy cows  
R Pulido & J D Leaver

Continued.....

**Tuesday 21 March 1995**

**Poster Session**

**Grand Hall**

**Authors in attendance 16:15-17:15**

**Session Opens 0900**

**CATTLE NUTRITION & PRODUCTION**

- 157      An evaluation of a protected trace mineral supplement (Carbosan Copper) for beef cattle  
            P S Kirby & D G Chapple
- 158      Limitations in digestible methionine in the intestine (metDI) for milk protein secretion in dairy  
            cows fed a ration based on grass silage  
            Y Chilliard, J Rouel, A Ollier, J Bony, K Tanan, B K Sloan
- 159      The relationship between digestibility, methane energy loss and metabolisable energy of whole crop  
            wheat forages.  
            A T Adesogan, D I Givens & E Owen
- 160      Comparison between growing fattening bulls finished at grass or indoors: Meat characteristics and  
            fat composition  
            J L Hornick, S Gauthier, A Clinquart, C Van Eenaeme & L Istasse

Tuesday 21 March 1995

Poster Session

Grand Hall

Authors in attendance 16:15-17:15

Session Opens 0900

### SILAGE

- 161 Effect of ammonia treatment of straw on rumen environmental conditions affecting fibre degradation  
M Fondevila, G Muñoz, A Barrios & C Castrillo
- 162 Evaluation of maize silage in the diet of finishing steers  
N H McCabe, F P O'Mara & P J Caffrey
- 163 Effects of sources of carbohydrate and protein given at low levels with grass silage *ad libitum* on the performance of lactating dairy cows  
K Aston, R J Dewhurst, W J Fisher, D W R Davies & A B McAllan
- 164 Voluntary intake, digestibility and rate of passage of a hay and a silage fed to horses and to cattle  
B McLean, A Afzalzadeh, L Bates, R W Mayes & F D DeB Hovell
- 165 Effect of wilting silage on intake and growth of weaned suckler bulls  
D Pullar & D I Givens
- 166 A comparison of supplements to grass silage for beef cattle  
R W J Steen
- 167 The effect of protected methionine and lysine on milk production and composition on grass silage based diets  
B A Younge, J J Murphy, M Rath & B K Sloan
- 168 The effect of changing the carbohydrate composition of the concentrate component of the diet of grass silage fed cows on milk yield and composition  
E Smoler, D E Beever, M A Lomax, D J Humphries, G Perrott & J Waters
- 169 Comparison of urea and human urine for treating wheat straw at a tropical temperature; effects on digestibility *in vitro* and *in situ*  
E D Mackintosh & E Owen

### POSTERS FOR THEATRE SESSION

Spa Theatre

Tuesday 21 March 1995

Theatre Session  
Spa Theatre

### TRANSPORT OF ANIMALS

- 170 *Behaviour of pigs and sheep during road transport*  
R H Bradshaw, S J G Hall & D M Broom
- 171 *Effect of space allowance during transport on the behavioural and physiological responses of sheep*  
M S Cockram, J E Kent, N K Waren, R E Jackson, G M Muwanga, S Prytherch & P J Goddard

### POULTRY

- 172 *Effect of phytase supplementation of diets containing rice bran on growth performance and bone characteristics in broiler chickens*  
M A Aboosadi, J R Scaife, I Murray & M Bedford

Session Opens 0900

PIGS

- 173 Feeding increased rations of ileal digestible methionine to lysine on the performance of lean genotype pigs between 25 and 50 kg liveweight given low protein diets  
J Braund, P H Simmins, J Weigel & R Maillard
- 174 Whole rapeseed meal in pig finishing diets - effects on carcass and meat quality  
K R Matthews & D B Homer
- 175 The digestibility of energy, nitrogen and non-starch polysaccharides (NSP) by growing pigs from semi-purified diets containing 8 different sources of NSP at 4 levels of inclusion  
A C Longland, A G Low, S P Bray & D Quelch
- 176 Influence of full-fat rapeseed and supplementary vitamin E on growth, carcass characteristics and meat storage quality of pigs  
G E Onibi, J R Scaife & V R Fowler
- 177 Partitioning of dietary protein in the Meishan synthetic and the European White breeds of pig during lactation  
A G Sinclair, S A Edwards, S Hoste, A McCartney & V R Fowler
- 178 The effects of nutrition on reproductive performance, lactation and carcass quality of once bred gilts  
A H Stewart, S A Edwards & V R Fowler
- 179 Nutrition-reproduction interactions in Large White x Landrace and Chinese Meishan gilts  
A R Pickard & C J Ashworth
- 180 *Ad libitum* feeding of group housed Meishan synthetic sows during pregnancy  
R J Berry, S A Edwards & A McCartney
- 181 Urinary mercapturic acids as markers for the estimation of isothiocyanate release in the digestive tract of rats following oral administration of glucosinolates  
A J Duncan, T Acamovic & I I Onaga
- 182 Association between birth order, blood pCO<sub>2</sub> and  $\beta$ -endorphin concentration in newborn piglets  
F L Chiang & R G Rodway
- 183 Expression of IGF-I and GH-receptor (GHR) and mRNA in liver and skeletal muscle of different pig breeds  
J M Brameld, J L Atkinson, T J Budd, A M Salter, P J Buttery, J C Saunders & R S Gilmour
- 184 Relationships between foetal fluid insulin-like growth factor-one (IGF-1) levels and foetal growth following reciprocal embryo transfer between Meishan and Landrace x Large White gilts  
C J Ashworth & T Atkinson
- 185 Effect of dietary fat level on lipoprotein composition in different breeds of pigs  
P Domenech, A C Barroeta, R Sala & R Codony
- 186 Comparison of factors affecting the tenderness of pigmeat  
J D Wood, S N Brown, F M Whittington, A M Perry & S P Johnson

Continued.....

Wednesday 22 March 1995

Poster Session  
Grand Hall  
Authors in attendance 1030-1130

Session Opens 0900

**PIGS**

- 187      Within litter effect of halothane genotype on performance and conformation  
            B Grundy, A J Webb & P Kitchin
- 188      The heart rate response of pigs to two slaughter handling systems and CO<sub>2</sub> stunning  
            S D Webster, A R Jones, H J Guise & T E Abbott
- 189      Effect of length of the sticking wound on the rate of blood loss and the time to loss of brain  
            responsiveness in pigs  
            M H Anil, J L McKinstry, P E Whittington & S B Wotton
- 190      Assessment of distress experienced by witnessing slaughter in pigs  
            M H Anil, J L McKinstry, M Field, M Bracke & R G Rodway

Session Opens 0900

**PIG WELFARE & RUMINANT WELFARE**

- 191 An assessment of pig welfare in very large groups of weaned pigs from outdoor systems  
A Xalabarder, J A Roden, P R English, O McPherson & A Head
- 192 A comparison of single and group farrowing/lactation paddocks for the first parity sows in an outdoor system  
A Head, P R English, J A Roden, O McPherson & A Xalabarder
- 193 The effects of enrichment on welfare, production and meat quality of the pig  
V E Beattie, N Walker, L J Farmer & I A Sneddon
- 194 A comparison of performance and behaviour of Meishan crossbred sows and piglets in crate and multisuckling systems  
W Wattanakul, A H Stewart, S A Edwards, P R English & A Marr
- 195 Human-animal interactions in early life in female pigs and the effects on subsequent behaviour, physiology and reproductive performance  
M A Varley & R Stedman
- 196 A scoring method to assess damage caused by aggression between sows after mixing  
A Burfoot, R M Kay & S Corning
- 197 Agonistic social interactions and heart rate responses of group-housed sows  
J N Marchant, D M Broom, A R Rudd & M T Mendl
- 198 Suckler cow colostrum yield and immunoglobulin concentrations and their calves' serum immunoglobulin concentrations  
M McGee, M J Drennan & P J Caffrey
- 199 An investigation into the heart rate of dairy cattle during the milking process  
J E L Day & A R Jones
- 200 The behavioural, endocrine, and immune responses of suckled calves to weaning and creep-feeding  
A M Mackenzie, T G Rowan, S D Carter, J B Dixon & J Tebble
- 201 The influence of hoof trimming on claw measurements in dairy cattle  
D Boelling & G E Pollott
- 202 Arterial blood supply to the head of the deer  
G E Callaghan, M H Anil, J L McKinstry & A V Fisher
- 203 Effect of handling and transport on bruising in sheep sent directly from farms to slaughter  
A M Jarvis & M S Cockram
- 204 Increased  $\mu$ -opioid receptors in sheep brain after transport  
E A Azaga & R G Rodway
- 205 The handling of sheep at markets and the occurrence of bruising  
A M Jarvis & M S Cockram
- 206 Pre-slaughter handling of cattle and the occurrence of bruising  
A M Jarvis, M S Cockram & L Selkirk
- 207 Effective fibre and abnormal behaviour in stall housed lambs  
J J Cooper & J McCullam



**POSTERS FOR THEATRE SESSION**

*Regency Room*

**Theatre Session  
Regency Room**

**DIET SELECTION - Joint WPSA/BSAS Session**

- 208      *Response of weaned pigs to choice feeding of complete diets*  
            *P G Lawlor, P B Lynch, P J Caffrey, W D Henry & D Harrington*
- 209      *Diet selection by cattle offered a choice between clean or slurry contaminated swards: effects of application method and time since application*  
            *J A Laws, A J Rook & B F Pain*
- 210      *Choice feeding to characterise genotypes in pigs*  
            *J M F Wilson, O I Southwood & H A M van der Steen*

# **Winter Meeting Summaries 1995**