

SUMMARY LIST

PRECISION LIVESTOCK AGRICULTURE

- 1 Detection of dairy cow behaviour changes associated with claw horn lesions using biosensors
Z E Barker, H R Hodges, J A Vazquez Diosdado, N J Bell, E A Codling, D P Croft, J R Amory
- 2 A new system for automatic weighing of beef cattle
D W Ross, S M Troy, C-A Duthie, J J Hyslop, R Ritchie

CATTLE REPRODUCTION

- 3 Effect of oestrous synchronisation programme and season on pregnancy rate to timed artificial insemination in beef cows
F Randi, P Lonergan, M H Parr, F Lively, M G Diskin, D A Kenny
- 4 Comparative live weight, body condition score at breeding and reproductive performance of high and low replacement index beef cows
S McCabe, N McHugh, N E O'Connell, R Prendiville
- 5 Effect of altering plane of nutrition during the first and second six months of life on age at puberty onset in Holstein Friesian bulls
C Byrne, A-M English, S Fair, P Lonergan, D A Kenny
- 6 The effect of early life plane of nutrition on testicular development of Holstein Friesian bull calves
A-M English, C Byrne, J Cassidy, D A Kenny, S Fair
- 7 Sero prevalence of reproductively important pathogens in beef cows on the island of Ireland
M H Parr, P Doolan, F Randi, F Lively, M G Diskin, D Barrett, D A Kenny
- 8 Bovine viral diarrhoea virus infection alters uterine prostaglandin profiles and inhibits interferon tau initiated pregnancy recognition in cows
Z Cheng, R Ellis, A Abudureyimu, F C Oguejiofor, D C Wathes
- 9 Interaction of preimplantation factor with the bovine global endometrial transcriptome
R E Clamp, C Creevey, M Natoli, E R Barnea, D Nash, M T Rose
- 10 The effect of dietary omega-6 and omega-3 fatty acid supplementation on semen volume and quality in young post-pubertal dairy bulls
C Byrne, A-M English, S Fair, P Lonergan, D A Kenny

THE THREE PILLARS OF SHEEP PRODUCTION - GENETICS

- 11 The development of a UK national terminal combined breed genetic evaluation
K L Moore, S Boon, K Kaseja
- 12 Gene pool fishing by out-crossing and back-crossing cycles to accelerate genetic improvement in carcass traits of sheep
L Bunger, G Fell, K McLean, J Gordon, K L Moore, N R Lambe
- 13 Determining accurate proportion of breed make up of UK sheep to enable combined breed genetic evaluations
K Kaseja, S Boon, K L Moore
- 14 A comparison of the reproductive performance of Lleyn and Scottish Blackface ewes mated to same-breed rams and managed together post-mating in a Scottish hill farm
P Zhou, N Sargison, N R Lambe, C Morgan-Davies, T McEvoy

THE THREE PILLARS OF SHEEP PRODUCTION - NUTRITION

- 15 Investigating the measurement of feed efficiency in sheep
N R Lambe, L Bunger, J Conington, K L Moore, M P Coffey
- 16 Ewe body condition scoring (BCS) as a key performance indicator on commercial sheep flocks: lamb performance to weaning
N Wright, K Sinclair, N Kendall, L Stubbings, E Genever
- 17 Effect of nutritional restriction in mid-pregnancy on the response of ewes to additional protein supply in late-pregnancy and lactation
R G Wilkinson, N Naylor, A M Mackenzie, S E Pattinson, J Donaldson
- 18 Interactive effects of by-pass protein supplementation and parasitism on ewe performance
J G M Houdijk, A van der Heiden, Y Trienes, J E Vipond
- 19 The sheep skeletal muscle proteome: the effect of weight loss in three ovine breeds of different origin using label free proteomics
A Ferreira, P Nanni, T Kilminster, T Scanlon, J Milton, C Oldham, J Greef, AM Almeida

THE THREE PILLARS OF SHEEP PRODUCTION - HEALTH

- 20 Understanding the development of ovine footrot
R Clifton, L E Green, K J Purdy
- 21 A longitudinal study of factors associated with acute and chronic mastitis and their impact on lamb growth rate on 10 suckler sheep flocks in Great Britain
C Grant, E M Smith, L E Green
- 22 Teat-end hyperkeratosis in dairy ewes and its predisposing factors
S Vouraki, S A Termatzidou, P Kazana, A I Gelasakis, G E Valergakis, G Arsenos
- 23 Introducing a Targeted Selective Treatment worming approach on a hill farm using Electronic Identification of lambs
C Morgan-Davies, N R Lambe, F Kenyon, D McBean, H Wishart, D McCracken

COMPANION, CAPTIVE AND WILD ANIMALS

- 24 Investigating growth and nutritional characteristics of *Tenebrio molitor* reared on diets of varying quality
E Tetlow, T Parr, I Hardy, C Greenhalgh, A Salter
- 25 Heavy metal uptake and DNA integrity in *Cyprinus carpio* as biomarkers of freshwater pollution
F Jabeen, A S Chaudhry
- 26 Do puppies from puppy farms show more temperament and behavioural problems than if acquired from other sources? Using CBARQ to assess
R Gray, C Douglas, S Butler, J Serpell
- 27 Investigating health risks of different pesticide residues in *Channa marulius*, water and sediments from the River Indus
F Jabeen, A S Chaudhry
- 28 Does self-control training in puppy classes influence subsequent impulsivity in dogs?
A Korzeniowski, C Douglas

- 29 Do Staffordshire Bull Terriers experience more problem behaviours when acquired from rescue shelters than other sources - using CBARQ™ Canine Behaviour And Research Questionnaire
K Gash-Wales, C Douglas, J Serpell
- 30 Can activity assessment be used to detect oestrus in captive felids?
C J Andrews, M A Potter, D G Thomas
- 31 Exploring the effectiveness of hydrotherapy to rehabilitate gait in dogs with joint problems
A Raine, C Douglas, F da Mata
- 32 An internet survey to explore differences in temperament and behaviour in neutered and entire Staffordshire Bull Terriers using Canine Behaviour And Research Questionnaire CBARQ™
S Houston, C Douglas, J Serpell
- 33 Comparing welfare of dogs in rescue shelters and owner homes using a pragmatic location-based cognitive bias task
A East, C Douglas
- 34 Comparing the temperament of Newly Recognised Cross-Breed Dogs (Labradoodles and Cockapoos) and parent breeds using Canine Behaviour And Research Questionnaire
A Bradley, C Douglas, J Serpell

BEHAVIOUR AND WELFARE

- 35 Survey of floor types used on Northern Ireland beef farms
V Murphy, D E Lowe, F Lively, D I Matthews
- 36 Do ewes respond differently to the severity of pain experienced by their twin lambs after one is subject to a more painful procedure than the other?
A Collins, C Douglas, T Hockridge, A Simpson, V Molony, J Kent
- 37 Monitoring and modelling dust concentration and animal activity in broiler houses
T G M Demmers, T van Hertem, L Rooijakkers, A Youssef
- 38 Weight gain in calves weaned naturally compared with calves weaned by separation from their mother
D Albertsen
- 39 Risk factors for respiratory disease in dairy heifer calves on commercial farms in SE England
K Johnson, C Burn, D C Wathes
- 40 Performance of winter-born Holstein Friesian heifer calves wearing calf coats during the milk-fed phase of rearing
E C L Bleach, L J Carnell, C J Britton
- 41 Short scrotum castration increases total weight gain of lowland lambs when compared to the conventional rubber ring method
L S Perkins, R J Cooke
- 42 Current commercial lamb tail-docking and castration practices, and a trial of 1) incidences of pain responses in lambs when docked and 2) cleanliness of fleece with docked or entire tails
T Hockridge, C Douglas, A Simpson, A Collins, V Molony, J Kent
- 43 Effect of weaning system and percentage of East Friesian genotype on milk yield and lamb weight
A C Lizarazo Chaparro, J C Angeles Hernandez, J Gutierrez Molotla, M M Martínez Puebla, C Salgado Hernández

BEEF

- 44 An investigation into the effect of feeding *Saccharomyces cerevisiae* fermentation product to transition and finishing Scottish heifers
R Learmonth, D McClelland, A Bond, A Sinclair
- 45 The combined effects of including nitrate and increasing the lipid concentration within a silage-based diet on performance and efficiency of finishing beef steers
C-A Duthie, J A Rooke, S M Troy, J J Hyslop, D W Ross, A Waterhouse, R Roehe
- 46 Relationships between net feed efficiency (NFE) and mechanical measures of beef tenderness and cooking loss in finishing Stabiliser steers
J J Hyslop, R Fuller, U Taylor, D Pullar, D Thirlwell, C E Mitchell, D Dreux
- 47 Contrasting finishing strategies for Holstein-Friesian bulls slaughtered at 19 months of age
B Murphy, A K Kelly, R Prendiville
- 48 Optimal slaughter age of UK beef cattle to increase profitability and reduce greenhouse gas emissions
A T Moran, K L Moore, P Amer, M P Coffey
- 49 Performance of growing ongole crossbred cattle fed rations containing different levels of oil palm fronds silage
S Fakhri, S Suparjo, A Akmal, I Sulaiman

FORAGES

- 50 The effects of dietary nitrate addition and increased lipid concentration on methane (CH₄) and hydrogen (H₂) emissions from beef cattle are independent
S M Troy, C-A Duthie, J J Hyslop, D W Ross, R Roehe, J A Rooke
- 51 Genotypic relationships between methane emission and production traits in dairy cattle
I S Breider, E Wall, S Smith, R. Stöger, P C Garnsworthy
- 52 Formulating diets for dairy cows to reduce total feed carbon footprint
P C Garnsworthy, J M Wilkinson
- 53 Long-term changes in rumen volatile fatty acids (VFA) and archaea to bacteria (AB) ratios in cattle fed either high concentrate or mixed forage:concentrate diets with or without the addition of nitrate (NO₃)
A Rooke, S M Troy, C-A Duthie, J J Hyslop, D A Ross, T Waterhouse, R Roehe, R J Wallace
- 54 Prediction of enteric methane emissions from sheep fed fresh perennial ryegrass (*Lolium perenne*) using data measured in respiration chambers
Y G Zhao, N E O'Connell, T Yan
- 55 Use of near-infrared reflectance spectroscopy to predict individual and total fatty acid content of perennial ryegrass (*Lolium perenne*)
S A Morgan, S A Huws, J K S Tweed, R Sanderson, S J Lister, N D Scollan
- 56 Prediction of nitrogen excretion in sheep offered fresh-cut perennial ryegrass (*Lolium perenne*)
Y G Zhao, N E O'Connell, T Yan
- 57 Silvopastoral systems for sustainable animal production
D M Broom

CHALLENGES FACING GLOBAL SUSTAINABLE LIVESTOCK PRODUCTION

- 58 Developing-world livestock projects: gender equality as the key to sustainability and resilience to climate change
S J G Hall, N J C Chanamoto
- 59 Developing tools to quantify sustainability of intensive and extensive ruminant farming systems in sub-Saharan East Africa
J McFadzean, B Paul, C Birnholz, J Koge, A Notenbaert, M Lee, S Fraval, A Omores, M Van der Giezen, J Dungait
- 60 Holistically assessing dairy farm eco-efficiency by combining Life Cycle Analysis with Data Envelopment Analysis
A D Soteriades, S Moreau, T Charroin, M Blanchard, P Faverdin, A W Stott

EDUCATION AND COMMUNICATION

- 61 The economic impact of animal breeding research: a case study of dairy cow fertility index adoption
S Fowler, P Midmore
- 62 An economic analysis of production costs on a group of Irish suckler beef farms participating in a knowledge transfer programme
R F Taylor, P Crosson

POULTRY

- 63 Chemical composition and performance of chicks fed residues from the extraction of chemicals from distillers' grains
C Rymer, A Sharkey, D Juniper, C Ibenegbu, R Roque, M Villeges Torres, G Lye, J Ward, D Leak
- 64 Effect of haematological parameters of broilers fed graded levels of toasted African yam bean seed meal for the first five weeks of growth
M O Raji, A O Abdulraheem
- 65 Assessment of *Xylopi* *aethi* *opica* (Negro Pepper) as growth promoter using broilers
E Ndelekwute, G Enyenihi, E Ikpat, D Akpan, H Akpan
- 66 Effect of dietary powdered *Echinacea purpurea* and *Tribulus terrestris* on performance, haematology and some blood parameters of broilers
B Shokrollahi, K Sayedoshohadaei, F Kheirollahi
- 67 Comparison of bioavailability of different commercial sources of choline for broiler chickens
S Honarbakhsh, M Zaghari, L Mirshekari, H R Ghalamkari
- 68 Effect of heat stress on growth performance and rectal temperature of broiler chickens
K Adomako, C M Milfort, W Habashy, L Fuller, S E Aggrey
- 69 Effect of gelatinization of fermented cassava meal on its hydrogen cyanide content, haematological and serum biochemical indices of finisher broilers
E Enyenihi, E Ndelekwute, A Udedibie
- 70 Comparison of bioavailability of different commercial sources of dicalcium phosphate for broiler chickens
S Honarbakhsh, M Zaghari, H Moravej, A H Golbaz, H R Ghalamkari
- 71 Assessing the genetic diversity of indigenous chicken genotypes in South-western Nigeria using microsatellite markers
A B Ajibike, B M Ilori, O A Adeniyi, A O Adebambo

SHEEP AND GOAT NUTRITION AND PRODUCTION

- 72 The effects of forage type and molybdenum and sulfur supplementation on copper status in growing lambs
A A Hussein, A M Mackenzie, R G Wilkinson, J A Huntington
- 73 Effect of dietary iron with and without sulphur on copper metabolism in sheep
S Sefdeen, A M Mackenzie, R G Wilkinson
- 74 Effects of growth promoters on expression of genes associated with lipid metabolism in ovine skeletal muscle, subcutaneous adipose tissue and liver
M F Ab Aziz, S Al-Doski, K Hemmings, Z C T R Daniel, J M Brameld, T Parr, A Salter
- 75 Effects of age at first joining and ewe genotype on performance of ewes lambing at 2 years of age
T W J Keady, J P Hanrahan
- 76 Effect of stocking rate and prolificacy potential on lamb performance and carcass output from a grass based production system
E Earle, N McHugh, T Boland, P Creighton
- 77 Techniques to advance oestrus in ewes - a comparative study between the use of progestagen sponges and the 'ram effect'
S Batten, P Watson, B R Evans
- 78 Relationship between body weight and milk production in dairy sheep
S Radic Schilling, J C Angeles Hernandez, A M Vera Arias, P R Echeverria Perez, O O A Castelan, M Gonzalez Ronquillo
- 79 Association of milking parlours and milking procedures with subclinical mastitis in dairy sheep
S A Termatzidou, S Vouraki, P Kazana, A Gelasakis, G Valergakis, G Arsenos
- 80 Zinc concentration changes in the tissues with supplementation of different zinc sources in growing Baluchi lambs
S Sobhanirad
- 81 Effect of *Acacia erioloba* and *Dichrostachys cinerea* supplementation on doe and kid growth of indigenous Namibian goats
L N Marius, E L K Osafo, I D T Mpofu, V Attoh-Kotoku, E Lutaaya, K L Shiningavamwe, P van der Merwe, E Missanjo
- 82 Effects of high dietary zinc concentration and zinc sources on serum biochemical parameters in growing lambs
S Sobhanirad, E Rabieimotlagh
- 83 Effect of dietary inclusion of cashew nut shell liquid on performance and rumen fermentation in West African dwarf goats
R Y Aderinboye, S I Afolabi, I O Bodunwa, K O Yusuf, A O Oni, O A Isah
- 84 Influence of feed restriction on the dairy goat mammary gland proteome: a study in two breeds with different levels of tolerance to weight loss
L E Hernandez-Castellano, A Ferreira, P Nanni, J Grossmann, A Arguello, N Castro, J Capote, A M Almeida
- 85 Comparison of composite and traditional sheep breeds using a range of key performance indicators to identify areas of economic impact
R Foy

RUMINANT GENETICS/GENOMICS

- 86 Genomic regions underlying bovine tuberculosis resistance in Holstein Friesian dairy cattle
K Raphaka, O Matika, E Sanchez-Molano, R Mrode, M P Coffey, V Riggio, L Glass,
J A Woolliams, G Banos
- 87 Polymorphisms in genes regulating aspects of innate immunity are associated with life expectancy in
a population of UK Holstein dairy cows
X Chen, G E Pollott, Z Cheng, D Werling, S J Zhang, D C Wathes
- 88 Phenotypic and genetic correlations between age at first kidding and 305 day milk yield in dairy goats
S Desire, S Mucha, R Mrode, M P Coffey, J Broadbent, J Conington
- 89 Genomic selection for conformation traits in UK dairy goats
S Mucha, R Mrode, M P Coffey, J Conington
- 90 Detection and utility of ancestral haplotypes in cattle breeds
E Sánchez-Molano, D Tsiokos, D Chatziplis, H Jorjani, E Nicolazzi, G Banos
- 91 Random regression analysis to determine herd profiles for carcass weight in UK beef cattle
T M. Englishby, D P Berry, K L Moore, M P Coffey, G Banos
- 92 Genetic parameters of lamb survival for Dorset, Lleyn and Texel sheep
A McLaren, S Mucha, K Kaseja, K L Moore, S Boon, J Conington
- 93 Comparative maternal performance of high and low replacement index beef cows
S McCabe, N McHugh, N E O'Connell, R Prendiville
- 94 Joint genetic analysis of Jersey dairy cows performing in two countries in Sub Saharan Africa
O Aejide, M Chagunda, R Mrode, G Banos, J Ojango, C Banga, G Simm
- 95 Investigating genomic selection in crossbred cattle using data from the Dairy Genetics Project for
East Africa
A Brown, J Ojango, M Okeyo, R Mrode
- 96 Is a cross-validation approach useful to overcome stringent multiple testing correction procedures in small
GWAS studies?
G E Pollott, J J Wu, S J Zhang, D C Wathes

IMPROVEMENTS IN PIG PRODUCTION THROUGH NUTRITION AND GUT HEALTH

- 97 16S rRNA gene sequencing reveals temporal shifts in the porcine faecal microbiota post-weaning,
independent of enterotoxigenic *Escherichia coli* challenge
J Pollock, D L Gally, L Glendinning, R Tiwari, M R Hutchings, J G M Houdijk
- 98 The effects of xylanase on weaner-grower pig performance and peptide YY concentration in portal and
peripheral blood
A Taylor, M R Bedford, H M Miller
- 99 Increasing *Buttiauxella* phytase dose up to 2000 FTU/kg increased nutrient retention and improved
performance in weaned piglets fed wheat or corn based P deficient diets
Y Dersjant-Li, A Wealleans, L Barnard, S Lane
- 100 Impact of zinc oxide on the immediate post weaning colonisation of enterobacteria in pigs
W Vahjen, D Mathé, J Zentek
- 101 The interactive effects of two different low dose dietary copper sources with phytase on weaned pig
performance
C H Gaukroger, P Buttin, M Vazquez, S A Edwards

PIGS

- 102 Ileal digestibility of crude protein and amino acid in rapeseed co-products fed to pigs
M M Kasprzak, J G M Houdijk, O A Olukosi, H Appleyard, S Kightley, P Carre, J Wiseman
- 103 Rapeseed meal as home grown alternative to soya bean meal for fattening pigs
J G M Houdijk, S Kightley, P Carre, M M Kasprzak, J Wiseman, O A Olukosi
- 104 Finishing pig performance and diet digestibility when offering diets with up to 300 g/kg of wheat or maize Dried Distillers Grains with Solubles (DDGS)
E Magowan, S Smyth, K McCracken, F Gordon, V Beattie
- 105 The effect of high phytase doses on phytate degradation and *myo*-inositol release in the grower pig
S Laird, C Brearley, I Kuehn, H M Miller
- 106 Effects of single and double feeder space on the feed intake and growth performance of pigs post-weaning from four to eight weeks of age
J Glover, J R Amory, K Lumbis, N Blackie
- 107 Performance of individual piglets when reared on sows divergent in output potential
A Craig, E Magowan
- 108 Identifying the optimum average pig weight to change diet in the finisher stage
E Magowan, J Kennan, R Bradford, E Lawrence, B Marshall, V Beattie
- 109 An association analysis of sow live-weight and back-fat depth as indicators of reproductive performance
A Lavery, P G Lawlor, E Magowan, H M Miller, K O'Driscoll, D P Berry
- 110 Investigating physiological measures of lifetime welfare in slaughter pigs
G A Carroll, L A Boyle, A Hanlon, M Palmer, L Collins, K Griffin, N E O'Connell
- 111 Life cycle assessment (LCA) applied to Irish commercial pig production
G A McAuliffe, T Takahashi, C L Sage, D V Chapman, M R F Lee
- 112 The effects of dietary brown seaweed (*Ascophyllum nodosum*) supplementation on alleviating heat stress in farrowing Landrace x Large White sows
D Ivermee, N Blackie

DAIRY CATTLE NUTRITION

- 113 Organic selenium and vitamin E supplementation improves feed conversion efficiency in heat stressed dairy cows
J Cottrell, M Sullivan, J Gaughan, K DiGiacomo, B Leury, P Celi, I Clarke, R Collier, F Dunshea
- 114 Pre-treating the ration with a crude fermentation extract derived from *Trichoderma* improved the dry matter intake and milk yield of first lactation heifers
N Walker, G Povey
- 115 Non-invasive indicators of rumen function and stress in dairy cows
L J Tennant, G White, R Anand-Ivell, P C Garnsworthy
- 116 Effects of concentrate nitrogen levels on production performance and nutrient digestibility of lactating dairy cows fed zero-grazed grass and concentrate diets
D Hynes, S Stergiadis, T Yan
- 117 Concentrate supplementation of a grass silage based diet during the dry period: effects on cow performance, metabolism and immune function
M Little, N E O'Connell, M Welsh, K Meade, C P Ferris

- 118 Seasonal variation of milk fatty acid profiles from dairy cows crossbred with US Brown Swiss in low-input farms in Switzerland
S Stergiadis, A Bieber, E Chatzidimitriou, E Franceschin, A Isensee, L Rempelos, M Baranski, V Maurer, G Cozzi, B Bapst, G Butler, C Leifert
- 119 The impact of field bean inclusion level in dairy cow concentrates on cow performance
D J Johnston, N E O'Connell, C P Ferris
- 120 Effect of inclusion rate and chop length of lucerne (*medicago sativa*) silage in a total mixed ration with maize (*zea mays*) on milk yield and composition in dairy cattle
A L Thomson, C K Reynolds, A Jones, D J Humphries
- 121 The effect of white or coloured flower forage pea silage as a replacement for grass silage on the performance and whole tract digestibility of high yielding dairy cows
C E A Campbell, J A Huntington, L A Sinclair

RUMEN FUNCTION *IN VITRO*

- 122 Effects of fresh grass, grass hay and vitamin E supplementation on the rumen function *in vitro*
A Belanche, E Jones, A H Kingston-Smith, C J Newbold
- 123 Effect of a saponin extract from *Hedera Helix* on protozoa activity and rumen fermentation *in vitro*
E Ramos-Morales, G de la Fuente, D Preskett, C J Newbold
- 124 Reduction of anti-nutritional enzyme inhibitors present in Adzuki bean and Soyabean by using different processing methods
W C Choi, T Parr, Y S Lim
- 125 Effect of Hederagenin bisuccinate, a chemically modified triterpene, on protozoa and rumen fermentation *in vitro*
E Ramos-Morales, G de la Fuente, M Bouillon, M Lahmann, C J Newbold
- 126 The effects of resistant starch from underutilised legumes on the growth of potential probiotic *Lactococcus lactis* isolated from barramundi (*Lates calcarifer*)
I K M Chiew, A M Salter, T Parr, Y S Lim
- 127 Manipulation of rumen nitrogen flows by use of Festulolium hybrids
S Wanjiru, A Belanche, M Humphreys, A Kingston-Smith
- 128 Effect of different forms of vitamin E on rumen fermentation and protozoal activity *in vitro*
A Belanche, R M Abad, A H Kingston-Smith, C J Newbold
- 129 Effects of rate of inclusion of marine algae and fish oil on the biohydrogenation of 20:5n-3 and 22:6n-3 polyunsaturated fatty acids *in vitro*
B E Till, J A Huntington, L A Sinclair
- 130 Evaluation of two modified Butanol-HCl methodologies for the analysis of free condensed tannins in conjunction with their quantity occurrence in alfalfa (*Medicago sativa* L.) dried at various temperatures
A Bouquet, J Amory, A Thompson, R Verwijns
- 131 Effect of grass - concentrate ratio and different levels of cashew nut shell liquid inclusion on *in vitro* fermentation products
K O Olagoke, R Y Aderinboye, C F I Onwuka, V O A Ojo
- 132 *In vitro* gas production of *Panicum maximum* as influenced by cutting height and stage of growth
A A Amisu, J A Olanite, P A Dele, S O Jimoh, M A Ademuyiwa, F O Shewu, A A Bello-ibiyemi

ADVANCES IN EQUINE SCIENCE

- 133 Ingestive behaviour of three novel forages in horses
L Niles, L Cameron, J Lowe
- 134 Effects of feeding frequency on nutrient digestibility and feeding behavior in the Turkmen horse
E Direkvandi, Y Rouzbehan, H Fazaeli
- 135 The effect of novel yeast strain *Saccharomyces cerevisiae* Y1242 on apparent digestibility in ponies
A Garber, P M Hastie, N D Walker, J M D Murray
- 136 Temporal changes in the faecal volatile organic compound (VOC) metabolome of healthy mares *pre-*
and *post-partum*
R Hough, S Salem, D Archer, C Probert
- 137 Incidence of Caslick's vulvoplasty operations in a population of Thoroughbred mares
R McLean, M Davies Morel
- 138 Anatomical differences in the equine pineal gland between gender and breed: a pilot study
S Dolman, S Daniels
- 139 A preliminary comparison of semen quality between competing and non-competing stallions
M Wilson, A Twigg-Flesner

EQUINE PERFORMANCE AND SPORTS MEDICINE

- 140 Thermographic imaging study into the comparative efficiency of cooling agents on the equine limb
post exercise
F Howell, A Twigg-Flesner, E Davies
- 141 Neural modulators of temperament: a multivariate approach to personality trait identification in the
horse
K Roberts, A J Hemmings, M J S Moore-Colyer, S D McBride, M O Parker
- 142 Effect of selenium and vitamin E supplements on blood lactate and serum lactate dehydrogenase
activity in horses undergoing moderate exercise
E Velazquez-Canton, A H Ramirez-Perez, N De La Cruz Rodriguez, L Ramirez Olivares,
L A Zarco Quintero, J C Angeles Hernandez

ENABLING EQUINE TECHNOLOGIES

- 143 Equicoll: a product for selecting robust stallion sperm for artificial insemination or freezing.
J Morrell, H Rodriguez-Martinez
- 144 Gastro-G a functional food/nutraceutical additive to help alleviate the underlying causes of Gastric
Ulcers in horses
D Nash, M Natoli, C Michael

POSTERS

- 145 Association of warm up and competitive placing at BE100 and Novice level eventing
K Patrick, H J Janicke
- 146 The implications of piglet temperature at birth and at 24 hours of age on survival
H Davis, P Toplis, S Jagger, H M Miller

- 147 Efficacy of a novel efficient phytate degrading bacterial 6-phytase in gestating and lactating sows.
P Ader, D Torrallardona
- 148 Comparative utilisation of two dietary fibre sources supplemented with direct-fed microbials in growing pigs
A A Fatufé, A O K Adesehinwa, E Ajayi
- 149 QTL mapping for Cell Mediated Immunity in chicken
V Raeesi, A Ehsani, R Vaez Torshizi, R Didehban, A A Masoudi
- 150 Principal component factor analysis of the morphostructural traits of West African dwarf sheep
A A Bello-ibiyemi, C O N Ikeobi, A S Adenaike, M Wheto, J S Decampos, D O Ogunlakin, R A Lawal, A A Amisu
- 151 Morphological changes induced by mineral supplements on *Bos indicus* × *Bos taurus* heifers in a tropical environment
L A Rodríguez-Campos, C Arroyo-Oquendo, F Blanco-Rojas, J I Herrera-Muñoz, R Molina-Coto
- 152 Patulin in Maize Silage
V Morris, J Raj, T Cogan, M Bailey, M R F Lee
- 153 Chemical constituents of sown and naturally existing *Sesbania sesban* and *Tephrosia candida* in late wet season
T O Muraina, J A Olanite, P R Adebayo, C B Emiola, I A Ewetola, O A Okukenu, S O Mustapha, Y T Adesetan, Y M Ishiaku, O Oladepo
- 154 Morphological changes induced by monthly injections of butaphosphane and cyanocobalamin or phosphorylcolamine, zinc, iodine and selenium on *Bos indicus* × *Bos taurus* heifers
L A Rodríguez-Campos, C Arroyo-Oquendo, F Blanco-Rojas, J I Herrera-Muñoz, R Molina-Coto
- 155 Bioaccumulation of heavy metals, phenol and polycyclic aromatic hydrocarbons on skin-on red Sokoto buck goats differently singed
A B Omojola, O J Aremo, O O Olusola, V Attoh-Kotoku
- 156 Growth performance of weaned rabbits reared under two different management systems in Nigeria
B Shehu, W Buba, M Magaji
- 157 Breadfruit (*Artocarpus altilis*) flour as an ingredient in meat patties
V Attoh-Kotoku, A B Omojola, A Donkoh, C C Atuahene, C Mawusi
- 158 Unfermented African locust bean flour (UALBF) *Parkia biglobosa* (jacq.) Benth as a non-conventional extender in frankfurter type sausages
V Attoh-Kotoku, A B Omojola, A Donkoh, C C Atuahene, A S Salmanu

INVITED

OVERVIEW OF THE NATIONAL AGRI TECH INNOVATION CENTRE

- 159 Introduction to the Agricultural Engineering and Precision Innovation Centre (Agri-EPI Centre)
W Thomson, Harbro Ltd

PRECISION LIVESTOCK AGRICULTURE

- 160 Imaging as a tool to implement precision engineering on-farm
D Barclay, F McLean, Innovent Technology Ltd

CATTLE REPRODUCTION

- 161 Control of puberty and breeding management of beef heifers for pregnancy success
G Perry, South Dakota State University, USA
- 162 Improving the reproductive efficiency of beef cow herds
D A Kenny, M G Diskin

THE THREE PILLARS OF SHEEP PRODUCTION - GENETICS

- 163 A review of genetic improvement programmes for sheep in the UK and a view of the next 10 years
S Boon, AHDB Beef and Lamb/Signet Breeding Services

THE THREE PILLARS OF SHEEP PRODUCTION - NUTRITION

- 164 Should we feed more metabolisable protein to pregnant and lactating ewes?
R G Wilkinson - Harper Adams University, J G M Houdijk - SRUC

THE THREE PILLARS OF SHEEP PRODUCTION - HEALTH

- 165 The big five iceberg sheep diseases and the actions that are needed
F M Lovatt, Flock Health Ltd

HUMAN: ANIMAL INTERACTIONS IN ZOO, COMPANION AND FARM ANIMALS

- 166 Furry friends and foes: human-animal relationships in the zoo
G Hosey, University of Bolton
- 167 Human-animal interaction: The benefits of pet ownership
C Westgarth, University of Liverpool

ANTIBIOTIC RESISTENCE

- 168 Livestock associated MRSA in the UK
M Holmes, University of Cambridge
- 169 Antimicrobial resistance in companion animals
E Ormandy, A Wedley, V Schmidt, I Tuerena, E Groat, D Timofte, S Dawson, G Pinchbeck,
N Williams, University of Liverpool

CHALLENGES FACING GLOBAL SUSTAINABLE LIVESTOCK PRODUCTION

- 170 Steps to Sustainable Livestock - The Global Farm Platform
M R F Lee - Rothamsted Research, M Eisler - University of Bristol
- 171 Sustainable animal protein (non-ruminant): a commercial perspective
S Jagger, AB Agri Ltd

EDUCATION AND COMMUNICATION

- 172 Innovations in educational programming: leveraging online learning to deliver graduate instruction in quantitative genetics and genomics
R Lewis, University of Nebraska - Lincoln, USA
- 173 From transfer to brokering: fostering multiple links and types of exchanges to enhance impact of animal science
L Klerkx, Wageningen University, The Netherlands
- 174 Farm business performance and the emotional & social competence of managers
N Adams, Promar International

BIG DATA IN PRACTISE

- 175 Extending the value of the literature; holo analysis of agricultural data.
H V Masey O'Neill - AB Agri Ltd, M Bedford - AB Vista
- 176 Data driven smart farm management with Farm Intelligence solutions
K Mertens, Porphyrio NV, Belgium

IMPROVEMENTS IN PIG PRODUCTION THROUGH NUTRITION AND GUT HEALTH

- 177 The importance of gut health - The veterinary clinician's perspective
M E C White, RCVS
- 178 Strategies to improve intake and gain in the weaned pig through gut health
R Faris, Cargill Animal Nutrition, Minnesota, USA

ADVANCES IN EQUINE SCIENCE

- 179 Equine welfare indicators and impact of management practices
M Hausberger, Clemence Lesimple, CNRS and University of Rennes 1, France

ENABLING EQUINE TECHNOLOGIES

- 180 Enabling Equine Technologies
D Marlin, Oklahoma State University, USA

