NEW BEEF/SHEEP INFORMATION from BSAS

SHEEP RESEARCH FEATURES **April 2008**

Please find attached a series of features that have been prepared to assist the understanding of scientific papers presented at the recent BSAS Annual Meeting; they have been prepared from the summary papers submitted by authors.

These features have not been checked by the author.

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Using crossbred hill ewes can improve finishing lamb performance

BSAS Paper 22

There is significant potential to improve the carcass quality of lamb sourced from the hill sheep sector by crossing a proportion of Blackface ewes with upland or terminal sires to produce crossbred replacement females. This was the key finding of a study to investigate the effects of switching to crossbred hill ewes, on lamb performance during finishing, which was outlined to delegates at this year's British Society of Animal Science's annual conference.

Hill sheep flocks in the UK are dominated by purebred ewe genotypes, with the Scottish Blackface, Welsh Mountain and Swaledale being the most common. However recent changes to the Common Agricultural Policy have lead many hill producers to consider keeping crossbred ewes on the hill, with the aim of introducing complementary traits to increase lamb output and improve carcass quality.

"And it could well be a good move," Ronald Annett from Hillsborough's Agri-Food and Biosciences Institute. "Our work demonstrated that retaining crossbred ewes with Cheviot and Texel genes improved lamb carcass conformation and reduced the level of carcass fat cover relative to pure Scottish Blackface lambs.

"Introducing Swaledale genes into the maternal line, however, had no effect on lamb performance or carcass quality relative to Blackface ewes," he added.

During November 2001 and 2002, 200 purebred Blackface ewes on each of the six Northern Ireland-based hill farms that took part in the trial were tupped with Blackface, Cheviot, Lleyn, Swaledale, and Texel rams. The female progeny from these crosses were retained for breeding, which began when ewes were approximately 18 months old.

The crossbred ewes were mated to Texel, Lleyn and Dorset rams in single sire mating groups, balanced for ewe genotype, liveweight, body condition and age. And during a two-year period, 588 male and female lambs were moved after weaning to a central

location for finishing. Lambs were permanently housed in groups of six and finished on one of four ad-lib concentrate diets comprising grass nuts, standard barley/soya based-concentrate, standard concentrate plus rapeseed meal and standard concentrate plus fish oil.

Lambs were weighed at weekly intervals until they reached their allocated slaughter weight of 42 or 50 kg for male lambs and 38 or 46 kg for female lambs.

“Higher concentrate intakes were recorded for lambs born from Texel cross ewes relative to those from Swaledale cross ewes, although there were no significant differences in feed conversion ratio between any of the ewe genotypes studied,” said Dr Annett.

“Lambs from Texel cross and Cheviot cross ewes tended to have higher daily live weight gains compared with those from Swaledale cross ewes, but there were no significant effects on daily carcass weight gain or killing-out percentage between any of the ewe genotypes.

“And carcasses of lambs from Blackface and Swaledale cross dams had poorer conformation compared with the other ewe genotypes. Higher carcass fat scores were observed in lambs from Blackface and Swaledale cross ewes relative to those from Texel cross and Cheviot cross ewes,” he added.

Presented to the British Society of Animal Science Annual Meeting, March 31 to April 2, 2008, Scarborough, UK.

Full details: Annett R, Carson A, Dawson L and Irwin D: “Crossbred versus purebred ewe genotypes for the hill sheep sector: effects on finishing lamb performance.”

For further information visit http://bsas.org.uk/Meetings_&_Workshops/ or contact BSAS on 01314 454508

Scrapie risk can be assessed by looking at genotype

BSAS Paper 25

A test for sheep milk could be the key to developing a genotyping programme to help sheep producers breed for scrapie resistance in their flocks.

Scrapie is a degenerative disorder of the central nervous system of small ruminants and scrapie in sheep appears to be controlled by genetic factors. The PrP gene is known to influence the susceptibility of sheep to the disease and these genes can be detected primarily with blood or ear notch tissue samples. But increasingly strict regulations on food safety and public hygiene require new, practical, animal friendly methods for large scale implementation.

The study, led by Mrs Androniki Psifidi from Greece's Aristotle University, set out to develop a genotyping method using DNA extracted from milk somatic cells from individual animal samples.

"And we also wanted to develop a quick, easy and accurate method for assessing the prevalence of undesirable genotypes within each flock using bulk milk," added Mrs Psifidi.

Individual milk samples were collected from 850 purebred Chios ewes raised in 19 flocks. Chios is the most productive breed in Greece.

Different DNA extraction protocols were used and evaluated and the results showed that a German silica-based commercial kit (NucleoSpin® Blood Macherey-Nagel) with the incorporation of a chloroform extraction step gave the highest quantity and quality of DNA.

"An advanced real-time method – ligase chain reaction (LCR) – was developed for the detection of rare polymorphisms in bulk milk samples and this seems to be more reliable method than restriction fragment length polymorphism (RFLP) for flock genotyping

using bulk milk," said Mrs Psifidi.

"LCR was easily applicable for testing high number of samples. Most important, low levels of undesirable polymorphisms could be detected in a background of excess different polymorphisms.

"The proposed method can provide a useful test for assessing the scrapie risk in milk and milk products produced by a flock avoiding individual animal genotyping. This can enable the labelling and marketing of potentially 'scrapie-free' dairy sheep products," she added.

Presented to the British Society of Animal Science Annual Meeting, March 31 to April 2, 2008, Scarborough, UK.

Full details: Psifidi A, Dovas CI, Basdagianni Z, Buzalas I and Banos G: "Assessing scrapie risk in dairy sheep flocks."

For further information visit http://bsas.org.uk/Meetings_&_Workshops/ or contact BSAS on 01314 454508

Soaking straw in water can increase its utilisation in the rumen

BSAS Paper 44

Want to help your livestock get more from any straw added to their ration? Then just add water. Soaking straw in water increased the degradability of wheat straw and could, therefore, be used as an alternative to chemical methods to aid its break down in the rumen.

“The extent of increase in degradability is dependent upon the incubation – or soaking – time. But even moderate increase in degradability with soaking would be more desirable because water is readily available and, therefore, easy to use,” Abdul Chaudhry, from Newcastle University, told delegates at the British Society of Animal Science annual conference.

His study, carried out in conjunction with Triploi’s Al-Fateh University, set out to test the effect of different physical pre-treatments – soaking with water, with or without heating at different times – on the in-vitro dry matter degradability (DMD) of wheat straw.

Many methods have been tested in the past for upgrading low quality roughages – physical, chemical and biological. Pre-soaking of compound feed pellets has been reported to have a large effect on the fermentability characteristics of this and Dr Chaudhry and his team set out to find out if soaking could also improve the degradation, and utilisation, of fibrous feeds including cereal straws.

Experiments to test the effect of three soaking levels – no water, one litre of and one kilogram of straw, and two litres of water and one kilogram of straw – were carried out, each one repeated with two soaking temperatures (20°C and 60°C) and two soaking times (two and 16 hours).

Following further lab work, involving fistulated sheep, undegraded residues were collected, washed and dried to calculate the DMD of each straw for each treatment combination. And the data were statistically analysed to study the main effects of

soaking level and temperature and time of soaking and their interactions at each of the two incubation times.

“We found that DMD was improved with increasing soaking levels at both incubation times,” said Dr Chaudhry. “And because soaking with water does not require any expensive equipment or chemicals its use is desirable in low input feeding systems due to its safety for the users and the environment.”

Presented to the British Society of Animal Science Annual Meeting, March 31 to April 2, 2008, Scarborough, UK.

Full details: Shirif AF, Shakoor Chaudhry A, Younger A: “Upgrading the *in vitro* degradability of wheat straw by using soaking treatments.”

For further information visit http://bsas.org.uk/Meetings_&_Workshops/ or contact BSAS on 01314 454508

Video imaging is accurate predictor of lamb weigh and compostion BSAS Paper 48

Make movie stars of your lambs and improve your ‘intramuscular fat’ estimations. It seems that video imaging analysis (VIA) can accurately predict weight and composition of finished shorn lambs, in a non-disruptive manner, and substantially improves the estimation of intramuscular fat.

The SAC’s Nicola Lambe shared the results of a trial that set out to investigate the use of linear dimensions obtained from video image analysis to assess live weight, carcass composition and meat quality in lambs, with delegates at this year’s British Society of Animal Science annual conference.

Predictors of carcass and meat quality are sought that can be measured in the live animal, preferably at a young age, on-farm, and with minimum stress to the growing animal. “Several in vivo methods of assessing these traits indirectly in lambs have been developed, but most of these are expensive and require restraint and/or handling of animals, which can cause stress and affect growth rate,” said Dr Lambe.

In the study, carried out in conjunction with Silsoe Livestock Systems, mixed batches of male and female Texel and Scottish Blackface lambs were photographed at finishing – at a commercial slaughter weight and condition score – after being shorn. Ages ranged from 101 days to 205 days and live weight from 29kg to 47kg.

The digital images were processed to collect a synchronised set of linear dimensions taken from three views. Multiple linear regression was used to determine the relationships of these dimensions with conformation and meat quality data collected post slaughter, including total dissected weights of muscle and fat in one carcass side, chemically extracted intramuscular fat in the loin, shear force of leg, and loin muscles, and ultimate pH in leg and loin muscles.

“And we found that the VIA dimensions predicting composition in the two divergent breeds reflect changes in tissue proportions and distribution that are known to occur with maturity,” said Dr Lambe.

“One potential use for this measurement method may be to select lambs with preferred weights and composition for slaughter, using a camera above a feeder or drinker in a finishing shed.”

Presented to the British Society of Animal Science Annual Meeting, March 31 to April 2, 2008, Scarborough, UK.

Full details: Lambe NR, Schofield CP, Navajas EA, Roehe R and L. Bünger: “Video imaging analysis of live lambs to predict live weight, carcass composition and meat quality.”

For further information visit http://bsas.org.uk/Meetings_&_Workshops/ or contact BSAS on 01314 454508

Lamb carcass hanging method
can improve loin tenderness **BSAS Paper 54**

Some hanging methods used for lamb carcasses can have a beneficial effect on the tenderness of the loin, as measured by the Warner Bratzler shear force technique and sarcomere length. And hip suspension by the six-point hook, normally used in processing plants, could be an effective and cheaper method to tenderstretch lamb carcasses, according to a recently completed study by researchers at Queens University, Belfast.

Tenderness can be considered as a function of three components: connective tissue content/composition, sarcomere length, and proteolysis of the myofibrillar, the leader of the trial team Octavio Oltra told delegates at the British Society of Animal Science's annual conference.

"Improvement of sarcomere length and proteolysis can be achieved through optimal processing, such as hanging and ageing. The main technique that improves the sarcomere length is tenderstretch hanging. This technique increases the tension of the hind limb and loin muscles, avoiding the contraction of the fibres at rigor," he explained.

"In this experiment our aim was, under commercial conditions, to compare two methods of tenderstretch hanging and to examine the potential to improve the tenderness of lamb muscles."

The work was conducted using three experimental groups – the lamb carcasses of the first group were hung from a frame with hooks that supported six carcasses from the Achilles, as is normal practice in the meat plant.

The carcasses of the second group were suspended from the *pubis symphysis* by the same frame and the third group were suspended by a single hook placed under the *pubis symphysis* and then attached to the six-point frame. The single hook used was a tenderstretch hook for beef carcasses.

The carcasses were placed in a chill room for 72 hours and samples for sarcomere length were collected – two from the loin and one from leg.

"And we found that there were statistically significant differences in the sarcomere length between both tenderstretch methods and Achilles suspension for *longisimus thorasis, longisimus lumborum* and *Biceps femoris,*" said Mr Oltra.

"Between the two methods of hip suspension, there was a statistically significant difference in sarcomere length only for the sample from *longisimus thoracis* area."

Presented to the British Society of Animal Science Annual Meeting, March 31 to April 2, 2008, Scarborough, UK.

Full details: Oltra OR, Farmer LJ and Moss BW: "Comparison of different hanging methods of lamb carcasses."

For further information visit http://bsas.org.uk/Meetings_&_Workshops/ or contact BSAS on 01314 454508

Linseed key to retaining fatty acid levels in grass-fed lambs

BSAS Paper 59

Providing a creep feed for lambs finished at grass improves carcass growth and conformation, but it is necessary to provide a good source of 18:3*n*-3, such as linseed, in order to retain the beneficial fatty acid composition of grass-grazed animals.

So said Bristol University's Ian Richardson, when he presented the finding of a trail – to assess the addition of linseed to the concentrate, fed in a creep-feed system, and whether it would maintain or enhance the n-3 fatty acid composition of the meat of animals fed concentrates at grass during the finishing period – to delegates at this year's British Society of Animal Science annual conference.

"We found that supplementing these diets with vitamin E would also help to maintain the lipid stability of the meat as there is lower vitamin E concentration in concentrate based feeds compared to grass," Dr Richardson revealed.

Some sheep producers supplement new-season lambs with concentrates, often as a creep feed, in order to get them to market early before the price declines. "This concentrate is usually based on cereals and would be high in n-6 fatty acids, diluting the beneficial effect of grass grazing which promotes the n-3 polyunsaturated fatty acid content in the meat," he said, explaining the rational behind the study.

Sheep were gathered from the participating sheep producers to produce a flock of 80 sheep, which were divided into four balanced groups of 20. One group was finished indoors on a total concentrate diet with no green forage. The remaining groups of 20 were finished in one field, which had been divided into paddocks. One group was finished on grazed grass alone, while the others also had access to one of two concentrate diets.

After six weeks the lambs were slaughtered at a local abattoir and loin muscle was sampled from 12 animals in each group. Frozen sub-samples were analysed for fatty

acid composition and vitamin E content. Loin steaks, conditioned for 10 days, were cut, packed in modified atmosphere packs and subject to simulated retail display.

Colour on the surface of the steaks was measured through the pack lid daily and steaks in further packs were taken on day seven of display and analysed for lipid oxidation.

“And the results showed that feeding concentrates improved the carcass weight and conformation at slaughter over the grass grazed group and reduced the muscle content of 18:3*n*-3 and increased 18:2*n*-6,” said Dr Richardson.

“Incorporating linseed in the feed retained the additional 18:2*n*-6 and increased 18:3*n*- above that of the grass grazed animals.

“And feeding Vitamin E decreased as the amount of grass in the diet decreased, had no effect on colour stability but increasing the susceptibility to lipid oxidation, which was at an unacceptable level in the concentrate-fed group,” he added.

Presented to the British Society of Animal Science Annual Meeting, March 31 to April 2, 2008, Scarborough, UK.

Full details: Marriott D, Richardson I, Gibson K, Williams E and Scollan N: “Can the fatty acid composition of grass-fed sheep be maintained in a creep feed system?”

For further information visit http://bsas.org.uk/Meetings_&_Workshops/ or contact BSAS on 01314 454508

Silage quality – not cut – is key to reducing methane emission

BSAS Paper 65

Silage quality – not cut – has a key role to play in determining methane emissions from dairy cows. Between-year variation in silage quality affected methane emission from the diets for dairy cows more than the within-year variation emanating from different silage cuts, according to a study recently completed at SAC's Crichton Royal Farm.

"Methane from enteric fermentation is a large component of livestock related greenhouse gas emissions," said SAC's Mizeck Chagunda, presenting the trial findings to delegates at this year's British Society of Animal Science annual conference.

"Typically, methane emissions from enteric fermentation represent on average 6% of dietary gross energy, but this varies greatly with diet. In order to mitigate methane emissions in a way that is acceptable for both the environment and animal welfare, it is important to quantify the effects of different diets on methane emissions. So the objective of our study was to determine the effect of different silages on methane emissions from dairy cows," he explained.

Fifty individual silages samples, from 2002 to 2007, were studied for their potential production of methane. The silages were from first to third cut within each year. The analytical composition of the silages indicated an average dry matter content of 247.8g/kg, 146g/kgDM of crude protein, 104gN/kgTN of ammonia, 502.6g/kgDM of NDF, and an ME of 11.1MJ/kgDM.

In the analysis, the calculations were based on a scenario where the different silages were fed to a standard high milk producing cow.

The data for each ration were run in FeedByte, SAC's nutrition software based on least-cost diet formulation and linear programming modelling. The runs from FeedByte, among other outputs, produced dry matter intake for the cow and the potential amount of milk the cow would produce per day from silage alone. Enteric methane emission per

cow was estimated using two different equations.

“And we found that the silages that sustained low milk yield had higher methane emissions per litre of milk than those silages that sustained high milk yield. On average the cows produced 22kg of milk per day. Per litre of milk, the cows emitted an average of 0.013kg of methane,” said Mr Chagunda.

“The year in which the silages were produced had a significant effect on methane emissions, but the silage cut had no significant effect on methane emissions. It is silage quality affects the potential methane emissions of any particular silage,” he added.

Presented to the British Society of Animal Science Annual Meeting, March 31 to April 2, 2008, Scarborough, UK.

Full details: Chagunda MGG, Bell JF and Roberts DJ: “The effect of different forage based diets on enteric methane emissions from dairy cows.”

For further information visit http://bsas.org.uk/Meetings_&_Workshops/ or contact BSAS on 01314 454508

Ewes – and lambs – benefit from protein supplementation during pregnancy BSAS Paper 94

Protein supplementation can improve the body weight of both ewes and lambs facing worm infection pressures and it can also reduce ewe faecal egg counts (FEC) during lactation.

The latter finding has important implications for reducing pasture larvae contamination and reducing the infection risk for naïve lambs during their early life, according to the SAC's Alemayehu Kidane, who presented the results of a trail, carried out in conjunction with Greece's University of Thessaly Greece, to investigate the effects of metabolisable protein supplementation on parasite control and ewe and lamb performance in ewes trickle infected with the abomasal nematode *Teladorsagia circumcincta* at three different infection levels.

"Nematode egg excretion by periparturient ewes is the main source of infection for their immunologically naïve lambs. It has been shown that periparturient metabolisable protein (MP) supplementation can reduce nematode egg excretion," said Mr Kidane, who hypothesised that the magnitude of beneficial effects of MP supplementation during the trial would be higher at the highest level of infection due to the expected nutrient drain on the host.

During the trial, 72 ewes, scanned for twin pregnancy at nine weeks before lambing, were infected with either 1,000, 5,000 or 10,000 infective *T. circumcincta* larvae, every Monday, Wednesday and Friday from day-42 until day 25. From day-24, ewes of each group were restrictedly fed at 0.9 times their metabolisable energy requirement and either 0.8 or 1.3 times their assumed MP requirement.

Diets consisted of one third chopped hay and two thirds concentrates. Ewes and their lambs were weighed weekly and within 12 hours of lambing. Ewe faecal egg count (FEC, eggs per gram fresh faeces) was assessed twice a week.

“Immediately post lambing, ewes fed the higher amount of MP were heavier than the lower rate ewes (67.9kg compared to 65.4kg) but this was not affected by level of infection or the nutrition and infection interaction,” said Mr Kidane.

These effects were maintained throughout lactation, with both high and low protein supplemented ewes weighing 67.1kg and 64.6kg by day25. Litter birth weight was not affected by the level of maternal MP nutrition, level of infection or their interaction and averaged 9.8kg. Litters from ewes fed the higher amount of protein grew faster than litters from ewes fed a lower rate – 708g/day compared to 651g/day – but litter growth was not affected by level of infection or the nutrition and infection interaction.

“The effect of time on FEC tended to be significant both during pregnancy and early lactation. The interaction effects between MP and level of infection were not significant for FEC during late pregnancy and early lactation,” he added.

“All first order and second order interactions with time were not significant during periparturient period. Late pregnancy FEC was affected by level of infection but not by MP nutrition. In contrast, increased MP supply reduced FEC during lactation but the level of infection only tended to be significant. Throughout the study, FEC decreased with increasing level of infection.”

Presented to the British Society of Animal Science Annual Meeting, March 31 to April 2, 2008, Scarborough, UK.

Full details: Kidane A, Houdijk S, Athanasiadou BJ, Tolkamp I and Kyriazakis I: “Effects of the periparturient metabolisable protein nutrition on ewes subjected to different infection pressures with the abomasal nematode *Teladorsagia circumcinta*.”

For further information visit http://bsas.org.uk/Meetings_&_Workshops/ or contact BSAS on 01314 454508

Tannins could be future solution to controlling internal parasites

BSAS Paper 97

Tannins could be used to treat of intestinal parasites in sheep in the future, particularly since the prevalence of resistance to conventional anthelmintics in increasing. Some good news for sheep producers, which was shared with delegates at this year's British Society of Animal Science annual conference by Dickon Hovell from the University of Aberdeen. The finding was the result of a study carried out to determine the effectiveness of quebracho tannins as an alternative to anthelmintics in the control of gastrointestinal nematode parasites in lambs.

"Since their development, sheep producers have become heavily reliant on anthelmintics for the effective control of nematode parasites in their lambs and other grazing livestock. However, alternative approaches in the control of nematode parasites now need to be found due to the increasingly widespread development of anthelmintic resistance," he said, explaining the rational behind his work.

Forty cross-bred store lambs were brought inside one week before the experiment, ranked according to live weight, allocated to replicates of eight animals according to ranking, and to one of five treatments within each replicate at random. Faecal samples were collected and faecal egg counts (FEC) made. The lambs were housed in groups of eight, bedded on straw, offered an ad-lib diet of hay and 1.2kg of sugar beet pulp per group twice daily with continuous access to clean fresh water.

On day one, lambs in groups one and two were dosed with 30g of quebracho tannin, and lambs in group three with 60g quebracho tannin. Lambs in group four were dosed with 8ml of a conventional anthelmintic wormer. Lambs in group five were un-dosed controls. On day three of the experiment lambs in group two were dosed again with 30g of quebracho tannin. Lambs were weighed weekly, FEC were made twice weekly on six lambs from each group. The effect of treatment on FEC was analysed at each separate sampling time.

“As expected, the control group had the highest FEC and lambs dosed with the conventional anthelmintic wormer had a lower FEC than the control, with those dosed with quebracho tannins giving intermediate egg counts,” said Dr Hovell.

“Although not significant statistically, treatment with the conventional anthelmintic wormer gave the best weight gain of 2.0kg and there was the suggestion of a response to the tannin.

“Further work needs to be carried out on the dose level and dosing regimens with the use of quebracho tannins in commercial situations,” he added.

Presented to the British Society of Animal Science Annual Meeting, March 31 to April 2, 2008, Scarborough, UK.

Full details: Cruden L and Hovell FDdeB: “An evaluation of quebracho (*Schinopsis quebracho-colorado*) tannin for the treatment of sheep gastrointestinal parasites.”

For further information visit http://bsas.org.uk/Meetings_&_Workshops/ or contact BSAS on 01314 454508

Locomotion scoring can be a useful tool for sheep producers BSAS Paper 100

Locomotion scoring could be a useful tool for lameness surveillance and monitoring within sheep flocks – great news for sheep producers who, faced with increased financial and labour pressures, sometimes struggle to keep on top of sheep hoof health.

It was Mari Speijers, from Hillsborough's Agri-food and Biosciences Institute, who shared the positive findings of a recent trial with delegates at this year's British Society of Animal Science annual conference.

"Lameness is a major economic and welfare issue for the sheep industry in the UK and Ireland and it has been estimated that foot rot costs the UK sheep industry £24 million per year," she said.

"Although a feet lesion scoring system in sheep has been devised to monitor lameness, it is a time-consuming process. Locomotion scoring is well established in dairy cattle to record the incidence of lameness, but needs validation within sheep," she added, explaining the rational behind her work at the institute.

"The primary aim of our study was to investigate the association between locomotion score and the level and pattern of feet lesion scores in sheep. There is some evidence that there are differences in susceptibility to lameness between breeds. Therefore, a secondary aim of the study was to investigate feet lesions and locomotion in four crossbred genotype ewes."

The experiment, carried out over a three-year period and involving four breeds of ewe, revealed that there was a significant association between feet lesion score and locomotion score.

"As cumulative lesion score increased by a unit of 10, ewes were twice as likely to be lame," said Miss Speijers. "The number of lesions, severity of the lesion scores observed

and total cumulative lesion scores for all feet was lower for the Suffolk-cross ewes compared with the other ewe breed types.

“Suffolk-cross ewes had fewer lesions, lower severity of lesions, and less lameness overall compared to the other ewe genotypes,” she added.

Presented to the British Society of Animal Science Annual Meeting, March 31 to April 2, 2008, Scarborough, UK.

Full details: Speijers MHM, Dawson LER, Irwin D and Carson AF: “A study of feet lesions and locomotion scores in four crossbred ewe types.”

For further information visit http://bsas.org.uk/Meetings_&_Workshops/ or contact BSAS on 01314 454508

More research needed to investigate potential of 'natural' foot rot treatments BSAS Paper 102

Further research into the potential of natural products for the treatment of foot rot is needed and will be of particular relevance to organic sheep production systems. That was the finding of a study, recently completed by scientists at the University of Aberdeen, to investigate the efficacy and practicability as treatments for ovine foot rot of three plant extracts, which are known to kill a range of bacteria when applied topically.

"Ovine foot rot is a chronic, contagious, and painfully debilitating bacterial disease affecting the hooves of sheep," the university's Karen Smith told delegates at this year's British Society of Animal Science annual conference.

"It is the most common cause of lameness, resulting in a loss of an estimated £24 million annually and the main causative agents are two symbiotic, Gram-negative, strictly anaerobic bacteria. Natural methods of treatment have the potential of circumventing the increasing problem of antibiotic resistance, in addition to being favoured by consumers due to their perceived health and environmental benefits," she explained.

The treatments trialled were a gel 'control', aloe vera, neem seed oil, tea-tree oil, and Oxytetracycline antibiotic aerosol Terramysin™. Thirty-seven infected sheep were each allocated a treatment, at random, a replicate at a time. Treatment was carried out on a weekly basis on weeks 0, 1, 2, 4 and 5 during a five-week period. Treatments one to four were brushed on as the gel and treatment five was sprayed as the aerosol.

"We saw a clear response to each of the five treatments, although only tea-tree oil and Terramysin™ were significantly better than the gel control," said Ms Smith.

"And it did not escape our notice that the slight sealing effect of the gel control treatment may have helped healing – assuming that the disease would otherwise have

progressed normally," she added.

Presented to the British Society of Animal Science Annual Meeting, March 31 to April 2, 2008, Scarborough, UK.

Full details: Smith KJ and Hovell FDDeB: "The efficacy of natural extracts of aloe vera (Aloe barbadensis), neem oil (Azadirachta indica) and tea-tree oil (Melaleuca alternifolia), as treatments for ovine foot rot."

For further information visit http://bsas.org.uk/Meetings_&_Workshops/ or contact BSAS on 01314 454508

It is possible to breed sheep for footrot resistance

BSAS Paper 106

Good news for sheep breeder and producers – selection for resistance to footrot is possible. That was the message from SAC's Jo Connington who presented results of some research into the heritability of resistance to the disease to delegates at this year's British Society of Animal Science annual conference.

"Estimates for the heritability of footrot in Australian data are as high as 0.3 (but this may differ in Britain because of different bacterial strains, sheep breeds and environmental conditions," she said, explaining the rational behind the study that was carried out by the SAC, MLC, the Roslin Institute and the Royal School of Veterinary Studies.

"The aim of our study was to determine the heritability and repeatability of resistance to footrot in Scottish Blackface and mule sheep at different ages, and to assess if breeding for resistance to footrot is a credible option for British sheep breeders."

Several thousands of sheep were used during the study: 4,340 SBF ewes from experimental and commercial flocks were scored for footrot once a year in 2005 and/or 2006; 726 mules from experimental flocks were scored up to four times during a two-year period; and 1,199 SBF lambs were scored in 2005 only. These scores were used to develop a model to determine the heritability of footrot.

"And we found that resistance to footrot has a low to moderate heritability in Scottish Blackface ewes and mules, while correlations between successive scores and repeatability are generally positive but low," said Dr Connington. "Selection for resistance to footrot is therefore possible, but would greatly benefit from repeated measures on individuals and relatives. Resistance to footrot was found not to be heritable in lambs."

Presented to the British Society of Animal Science Annual Meeting, March 31 to April 2, 2008, Scarborough, UK.

Full details: Nieuwhof GJ, Conington J, Bünger L and Bishop SC: “Genetic aspects of resistance to footrot in sheep.”

For further information visit http://bsas.org.uk/Meetings_&_Workshops/ or contact BSAS on 01314 454508

Shearing sheep at mating – rather than housing – is a viable alternative BSAS Paper 124

Shearing prior to mating provides an alternative to shearing at housing. That's the conclusion of a study recently completed by scientists at Teagasc's Animal production Research Centre in County Galway.

"Ewes are normally shorn once yearly, usually in early summer, to maintain sheep welfare and to minimise fly strike. But winter conditions in Ireland are relatively mild and, consequently, ewes that are housed unshorn may have difficulty dissipating body heat due to the unique insulating properties of the fleece, leading to ineffective heat regulation," Teagasc's Tim Keady told delegates at this year's British Scoeity of Animal Science's annual conference.

"Results from previous studies showed that shearing at housing increased lamb birth and weaning weights by up to 0.63 and 2.5 kg respectively. Shearing at housing may require a greater management input as ewes are normally housed in smaller groups and need to be dry prior to shearing. However, shearing in the autumn prior to mating enables the total flock to be assembled under more favourable conditions," he added, explaining the rational behind the work.

"It is unknown if shearing prior to mating, in a temperate climate, impacts on subsequent ewe fertility and litter size while at the same time producing heavier lambs relative to shearing at the conventional time in early summer. So the aim of our study was to evaluate the effect of the season of shearing on ewe fertility of March lambing ewes and subsequent lamb birth and weaning weights."

A total of 130 ewes were allocated to four shearing treatments – conventional, prior to mating, at housing, and twice yearly – and were shorn on May 29, September 9, November 30, and May 29 and September 9, respectively.

The ewes on the prior to mating and housing treatments had been shorn the previous December while the ewes on the conventional and twice yearly treatments had been

shorn the previous May. The ewes were managed as one flock from the parturition prior to the study and all ewes had a synchronised oestrus – using progesterone impregnated sponges – prior to joining the rams on October 9 for syndicate mating.

The ewes were housed in slatted pens during the winter feeding period and offered silage-based diets supplemented with a total of 21 kg concentrate during the six weeks prior to lambing. The ewes were turned out to pasture within three days of lambing. Triplet rearing ewes received 1kg concentrate daily for five weeks post lambing and triplet lambs were offered concentrates to a maximum of 300g/day from birth to weaning. Ewes rearing single or twins and their lambs received no concentrate post lambing and lambs were weaned at 14 weeks of age.

“And we discovered, from the results, that ewes shorn twice yearly had a significantly higher condition score pre-mating then ewes on the other three treatments. Treatment did not alter condition score at lambing, litter size or number of lambs reared per ewe joined,” said Dr Keady.

“But lambs from ewes shorn at housing were heavier at birth relative to lambs from ewes shorn at the conventional time or twice yearly. Lambs from ewes shorn prior to mating and at housing tended to be heavier at weaning relative to lambs from ewes shorn at the conventional time,” he added.

Presented to the British Society of Animal Science Annual Meeting, March 31 to April 2, 2008, Scarborough, UK.

Full details: Keady TWJ and Hanrahan JP: “Effect of season of shearing on ewe and progeny performance.”

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