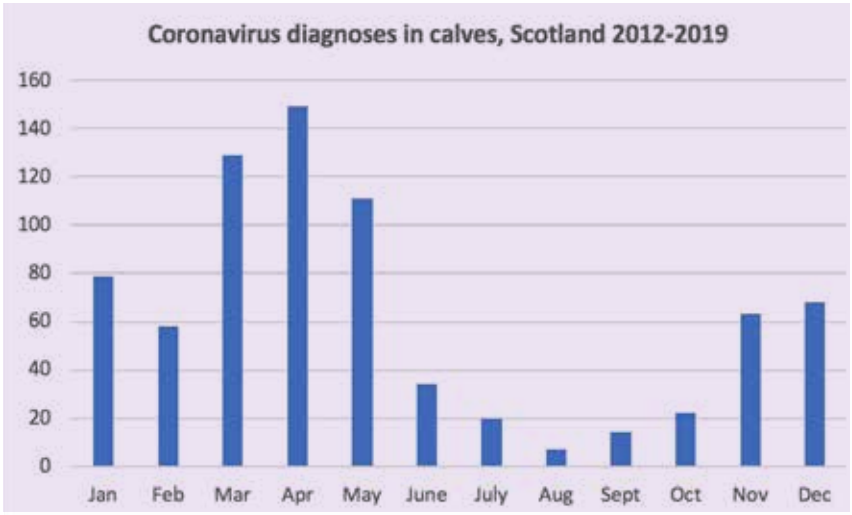
Surveillance News
SRUC
Animal Disease Surveillance News

# Coronavirus Disease in Cattle

While the covid-19 pandemic has brought coronaviruses to the forefront of public awareness, vets and stockmen are no strangers to this family of viruses. These pathogens can cause disease in a wide range of species, and can have a significant impact in livestock due to their highly infectious nature. The two forms of coronavirus disease in cattle mainly affect the intestinal tract, causing diarrhoea.

Just like rotavirus and a number of other pathogens, bovine coronavirus is part of the complex of organisms that are responsible for diarrhoea in calves in the first three weeks of life. Affected calves become depressed, pass profuse milky diarrhoea and dehydration can be so severe that calves die. There is no specific treatment, but many calves will require oral or intravenous fluids to aid recovery. Disease is best prevented by ensuring good hygiene and calf husbandry, with particular attention to ensuring adequate and timely colostrum intake. For farms with confirmed problems, vaccinating dams against coronavirus during pregnancy provides protection for calves via this intake of colostrum, and helps to minimise virus shedding and environmental contamination. Diagnoses in Scotland are seasonal (Figure 1), reflecting an increase in infections towards the end of each calving period, as contamination accumulates.




In adult cattle, herd outbreaks of diarrhoea occur, usually termed "winter dysentery". Characterised by watery, dark and sometimes bloody diarrhoea, the virus is very infectious and will spread to the entire group rapidly. In some outbreaks mild respiratory signs are also present. While dramatic in appearance, the disease tends to be mild with affected cattle typically eating normally throughout the two-to-three-day course of illness, although a marked milk drop may occur. Occasionally supportive care such as rehydration is required, but in most cases recovery is spontaneous and complete.

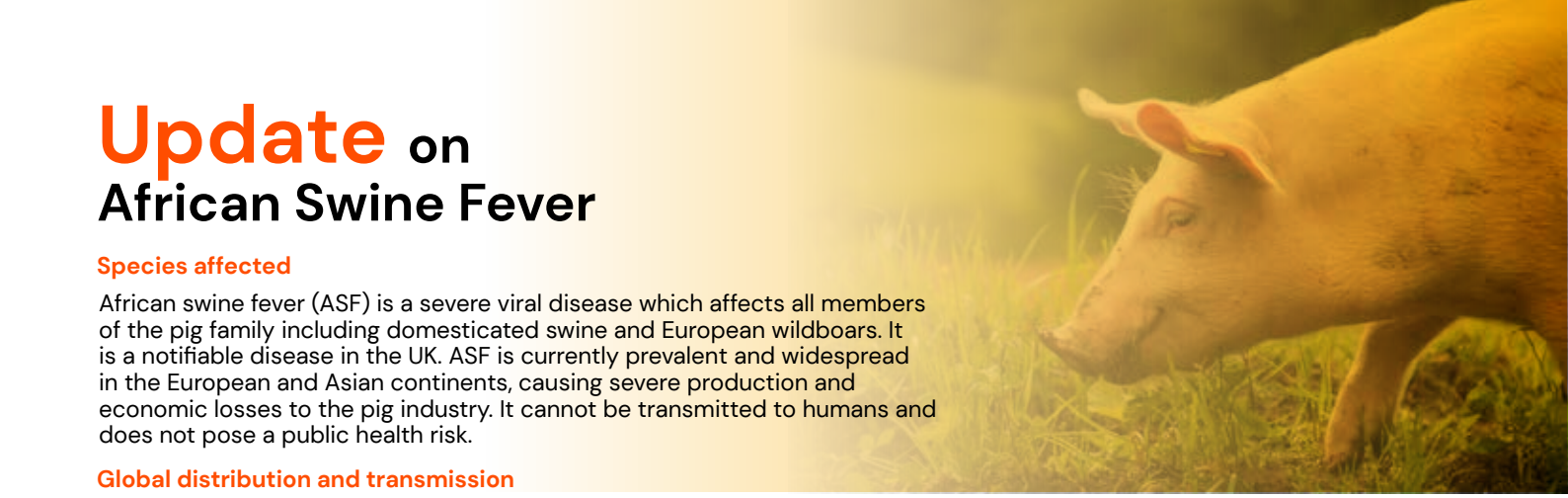
Reliable testing is available to confirm the diagnosis, and is particularly useful in young calves where several different agents may be involved in the incident. Veterinary laboratories offer testing and pen-side kits are in use by some vets.

By now we are all familiar with the biosecurity procedures necessary to control spread of coronaviruses between humans. Good biosecurity is also vital in controlling the diseases caused by these viruses in cattle. Thorough hygiene and rapid isolation of affected calves is essential to prevent spread of coronavirus scour to the rest of the crop. In adult cattle, outbreaks may occur when the virus is introduced to the herd with bought-in animals. Whilst bovine coronavirus doesn't infect humans, movements of people on- and off-farm can also be responsible for spread, so ensuring disinfection of equipment, clothing, footwear and handwashing between holdings is important to protect stock from infection.

## Autumn 2020

## Contents

# Update on African Swine Fever



## Species affected

African swine fever (ASF) is a severe viral disease which affects all members of the pig family including domesticated swine and European wildboars. It is a notifiable disease in the UK. ASF is currently prevalent and widespread in the European and Asian continents, causing severe production and economic losses to the pig industry. It cannot be transmitted to humans and does not pose a public health risk.

## Global distribution and transmission

Historically ASF has been an endemic infection in many African countries, and in 2007 ASFV Genotype 2 entered the Russian Federation (Georgia). To reduce the risk of spread to the EU those member states bordering the Russian federation implemented specific control measures. Despite these in 2014 ASF entered Estonia, Latvia, Lithuania, and Poland. Whilst sporadic outbreaks in domestic pigs were controlled, preventing extensive secondary spread, the disease became endemic in the wild boar population. In 2016 ASF spread to Moldova and in 2017 to the Czech Republic, Romania, Bulgaria, and Hungary. Hundreds of cases occurred in wild boar when the virus made a big leap to Southern Belgium in September 2018. China reported the first ASF case in 2018. China has experienced devastating losses to domestic pig production from ASF, which has seen the world's largest pig population suffer a 50% reduction. This has seen both supply and demand shortages not just in China, but globally. There is great concern about ASF infection in Asia, continuing spread appears far from effectively controlled and both China and bordering countries continue to notify outbreaks. In Europe July 2019 saw ASF notified for the first time in Slovakia and then in Serbia (August 2019). By December 2019, 21 countries had notified outbreaks, including 11 countries in Europe and 10 in Asia. In 2020, the latest APHA International Disease Monitoring reports further outbreaks in domestic pigs in Eastern Europe with Hungary, Poland and Romania reporting the highest number of cases.

## Routes of infection

ASF can be spread by direct contact with live or dead pigs and pork products. Due to the persistence of ASF virus, indirect transmission to domesticated pigs has occurred via intentional feeding of products such as uncooked pig meat and processed pig-derived products intended for human consumption (swill feeding) and unintentional access by both wild and domesticated pigs to discarded human food. In some domestic pig outbreaks fomites have been implicated as a source (ASF contaminated non-living objects). Examples include vehicles or people going between pig farms (their shoes, clothes, and equipment) and forage feed from areas with ASF infected wild boar. The current risk of introduction of ASF to the UK remains at medium for the entry of contaminated or infected products into the UK. Given the expected gradual reduction in air travel restrictions during the current COVID-19 pandemic, APHA have again strongly advised all travellers to avoid bringing any pork products – for example, dried or cured meats, sausages, salamis or pâté – back to the UK from affected parts of Europe and Asia. They remind people returning from any ASF-affected areas of the world to avoid any contact with domestic pigs in commercial holdings, smallholdings or even household pet pigs. Habitats where feral pigs or wild boar exist should also be avoided. It is important to understand the routes of infection in wild boar to avoid transmission to the wild pig population in the UK and subsequent spread between the wild and domesticated groups.

## Prevention and control

Control depends on those working in the pig industry including stock people and veterinary practitioners being educated and aware of the risks and signs of ASF. This allows for risk control and essentially the early detection of infected animals when outbreaks do arise. It is important for vets working with small holder or backyard pig keepers who may only see pigs occasionally to remain informed and vigilant and ensure that their clients do too. Involvement of the governing authorities in implementation of strict control methods is another piece of the jigsaw in successful control.

Please see https://www.gov.uk/guidance/african-swine-fever for more information.

## Deformed Jaws In Newborn Calves

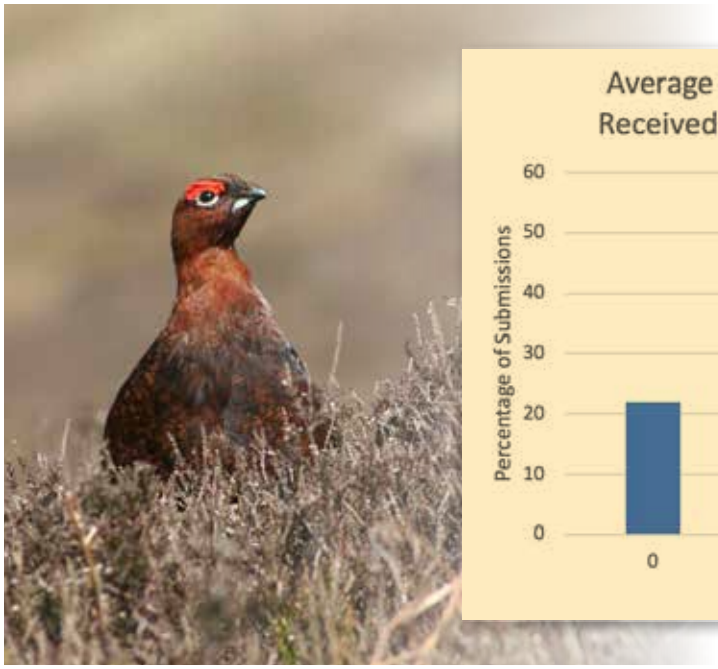
We would like to raise awareness of a condition that makes it difficult for newborn calves to suck. The lower jaw of affected calves is set at an angle and the tongue often sticks out, especially when they try to feed. The calves are otherwise bright and alert but, if the problem is not spotted, they are at risk of starvation or disease as they don't manage to ingest enough colostrum. Their ability to feed usually improves over a number of days. An online survey distributed to industry by SRUC in July 2019 received responses from 25 holdings across the UK. Twenty-two of these were beef herds, two had both beef and dairy enterprises, and one was solely dairy. Affected calves had been sired by Limousin (11), Charolais (9), Aberdeen Angus (4), British blue (2) and Holstein Friesian (1) bulls. Most were born between February and June, consistent with peak spring calving in beef herds; but cases were also reported in July, August, October, November and December born calves. Three quarters of herds described an incidence of less than 5 percent. However, six herds reported an incidence of between 8 and 15 percent. Twelve herds had seen small numbers of similarly affected calves in previous years. The cause of the condition is currently unknown and we would be interested to hear of further cases.

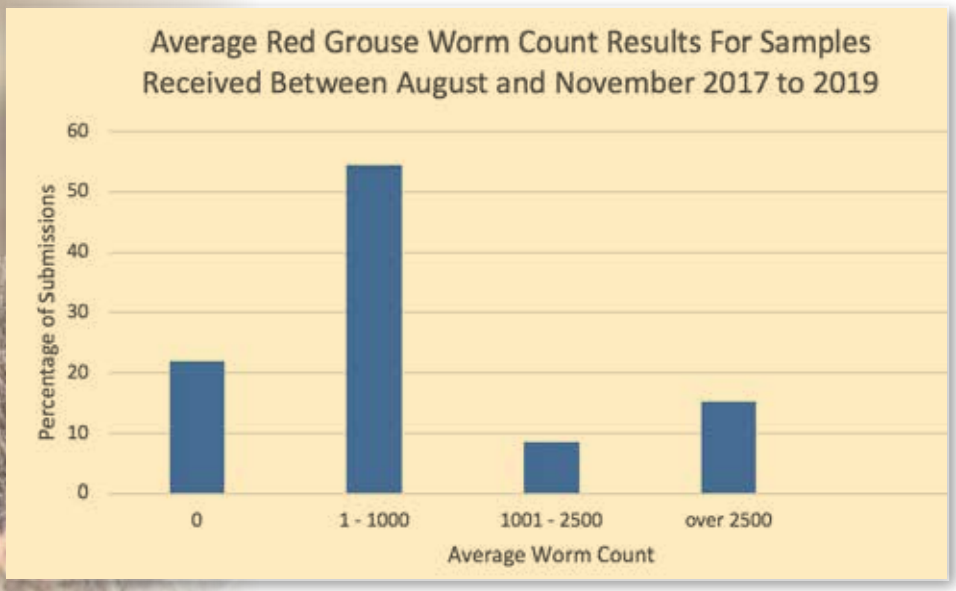
# Worm Control in Red Grouse

Infection with large numbers of *Trichostrongylus tenuis* worms in the intestines of red grouse reduces the productivity of grouse moors. Worm burdens vary from year to year and since 2007 control has relied on the use of quartz grit medicated with flubendazole. The Werritty Report from the Grouse Moor Management Review Group was published in late 2019 and included recommendations on the use of medicated grit. These are aimed at preserving the long-term efficacy of flubendazole and preventing flubendazole contamination of grouse meat and water courses. In order to achieve these goals it is important that:

- **medicated grit is only used when worm burdens are known to be high**
- **flubendazole is withdrawn 28 days before shooting commences**
- **grit trays are placed at least 5m from water sources**

Scottish Natural Heritage have been tasked with creating a Code of Practice on the use of medicated grit. The Game and Wildlife Conservation Trust have produced a set of guidelines and recommend that worm burdens are monitored by carrying out worm counts in autumn and worm egg counts in spring. They suggest collecting the intestines from a random sample of 20 birds shot in autumn and submitting these for worm counts. Results for samples received by SRUC Veterinary Services between August and November 2017 to 2019 are summarised in the graph. Submissions consisted of caeca from between 1 and 50 birds and the average worm counts were calculated. Counts from only 15.2% of submissions exceeded the 2500 worm threshold above which productivity is known to be affected.






Further information can be found at:

https://www.gov.scot/publications/grouse-moor-management-group-report-scottish-government/

https://www.gwct.org.uk/advisory/guides/medicated-grit-best-practice/

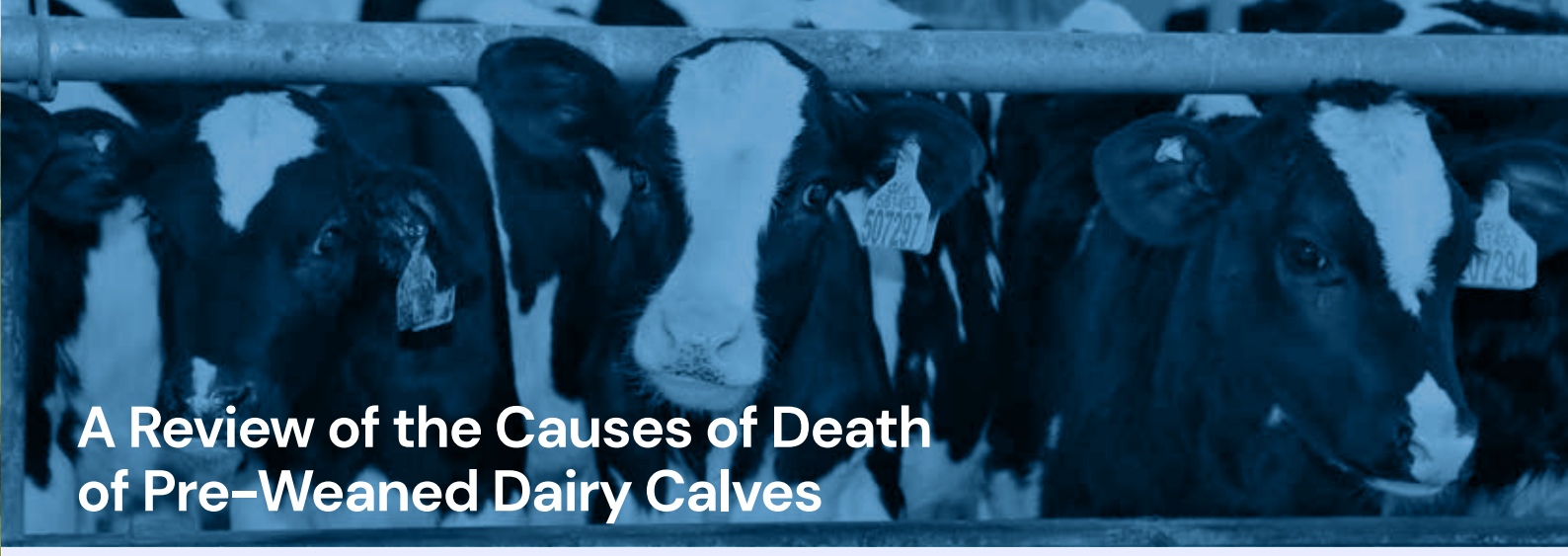
Photo credit: Nick Bramhall https://commons.wikimedia.org/wiki/File:Lagopus_lagopus_scoticus_Rowardennan.jpg

# SRUC Pathologists Identify New Virus in sheep

Specialist veterinary pathologists at SRUC have collaborated with scientists across the UK, Europe, and America to identify a new virus in sheep. This novel virus, of the picornavirus family, caused signs of nervous disease in lambs. The complex investigation began with the submission of lambs from a Scottish flock for postmortem examination back in 2016. The affected farm had several two to three week old lambs that appeared wobbly or weak, others were unable to rise. In some cases, the affected lambs died, in others there was apparent recovery. Examination of the brain and spinal cord identified findings similar to that seen in louping-ill (another virus disease to affect the brains of sheep) but testing for this disease proved negative. The following year, a flock in Wales had similar signs and postmortem investigation identified similar findings. Collaboration with colleagues across the UK veterinary surveillance network identified cases dating back to 1998 where lambs with similar pathology had been identified and tissues had been archived which allowed further testing to be performed.

Samples were submitted to the Institute of Diagnostic Virology, Friedrich-Loeffler-Institut (FLI) in Germany for whole genome sequencing which identified this new virus. In addition, scientists at the University of California-Davis were able to identify the virus at the site of the abnormal tissue in the brain and spinal cord, proving that this virus was responsible for the signs seen.

The results of this work suggest that this novel picornavirus has been present in the UK for over 20 years, but it is only the most modern technologies that have allowed this to be identified. All the cases of disease associated with this virus were in lambs aged less than four weeks. The background from the flocks in this investigation suggested that affected lambs were orphans or those given artificial colostrum. This observation raises the theory that the picornavirus, in most circumstances, results in limited disease. When lambs fail to absorb sufficient antibodies from their dams' colostrum however, clinical signs can develop.



# A Review of the Causes of Death of Pre-Weaned Dairy Calves

The proportion of dairy calves which die before weaning is an important indicator of animal welfare, and varies hugely between farms. While studies have been carried out to find out levels of mortality on different farms, there is very little known about the causes of these deaths across farms. This information is essential to target control measures to reduce losses.

SRUC VS carried out a review of all diagnostic carcase and viscera submissions received between 2014 and 2018 to provide information on the major causes of mortality in pre-weaned calves in Scottish dairy herds.

A total of 614 submissions were examined, and a definitive diagnosis was reached in 603 (98%), highlighting the value of a quality assured postmortem examination.

A total of 1017 diagnoses were made, with infectious disease responsible for 69 percent. Nutritional problems accounted for a further 25 percent, and the final 6 percent represented individual calf issues.

The five most common causes of mortality were:

- **Cryptosporidia**
- **Rumen drinking**
- **Rotavirus**
- **Salmonellosis due to Salmonella Dublin**
- ***E.coli* septicaemia**

Pneumonias made up around a fifth of the diagnoses, with Mycoplasma bovis the most common cause of pneumonia related deaths.

Organisms that caused diarrhoea made up around a third of the diagnoses, with cryptosporidia the most frequently diagnosed.

It was considered that a nutritional component had played a role in the death of 26 percent of calves, with rumen drinking accounting for the majority. Cases of suspected underfeeding were not included in this total as feeding volumes were not known for all calves.

Rumen drinking occurs when the milk which should enter the abomasum (fourth stomach) instead enters the rumen and ferments, causing acidosis and dehydration.

The feeding history of calves with rumen drinking was compared to that of control calves that had died of non-nutritional causes.

Key factors which appeared to predispose to rumen drinking were:

- **Feeding calves from an open bucket rather than a teat**
- **Feeding low volumes of milk**
- **Feeding waste milk**

This review highlights the contribution postmortem examinations can make when building up a comprehensive picture of calf health. The fact that 26 percent of deaths had a significant nutritional component demonstrates the importance of feeding management in ensuring the health and welfare of dairy calves.

# On-Farm Postmortem Examination

Over the last year SRUC's postmortem(PM) service changed as the PM room doors closed for farm animals in Ayr, Edinburgh, Inverness, and Perth. As a result, some farmers now choose to drive bodies to one of the remaining PM centres, but there has also been a rise in on-farm PMs in which SRUC Veterinary Services get involved. Previously livestock vets rightly raised concerns about doing PMs themselves due to costs, effective time use and reliability in reaching a diagnosis, as well as potential risks to their clients and themselves. To mitigate the loss of PM rooms interested vets were offered support both in the form of familiarisation training sessions and sampling kits. Vets can call on telephone advice and even personal assistance from SRUC Veterinary Services when undertaking a PM on-farm.

As much as it brings its own challenges, there are clear benefits of doing a PM on-farm. Getting an instant result is a bonus rather than the norm. It is however possible to rule out certain conditions quickly and avoid unnecessary treatments of cohort animals. Farmers are typically pleasantly surprised how cleanly an examination can be done. Many even find it interesting to watch, and gain insight into common conditions such as navel ill and pneumonia. PM examinations are clearly not the answer for every death on-farm but where they can be done safely and promptly there is no good case against them either.

The PM room in Inverness closed in May 2019 and private vets around the Highlands have submitted samples from 48 PMs since then. For 40 of these cases a diagnosis was reached, resulting in a diagnostic success rate of 83% which is similar to what is achieved in PM rooms. For many of these cases SRUC provided guidance on sample selection and discussed potential diagnoses with the practitioner before the submission of samples. Similarly, examinations were discouraged where the animal had died too long ago, or sampling of live cohort animals was deemed more effective.

In our experience, discussing a case before a PM is undertaken, and using SRUC vets to guide further investigations, results in a high diagnostic success rate. Therefore, where animals die unexpectedly and a fresh carcase is available it is well worth an animal keeper contacting their vet, who can in turn count on SRUC vets to support them.

# Rickets in Sheep

SRUC Veterinary Services, with assistance from the University of Edinburgh, have been involved in an investigation of rickets in sheep. In spring 2019 several flocks in South West Scotland had reported swollen and stiff joints, lameness and some angular limb deformities in growing hoggs. This was not only a welfare concern but also financially important as replacement ewe hoggs were often affected. A diagnosis of rickets was made from carcases submitted for postmortem examination.

Rickets is a developmental abnormality of bone and is due to insufficient vitamin D intake. Sheep can obtain vitamin D by exposure to UV light (sunlight) or supplementary feeding. A common feature of the affected flocks was that hoggs had been moved from hill ground to lowland ground for the winter period. During this period the hoggs were grazing on improved pasture which promotes rapid growth rates but at a time when there is limited exposure to sunlight. This in conjunction with no supplementary feeding leaves these animals growing rapidly but, with limited supply to vitamin D, at risk of developing rickets. Breeds with pigmented skin as opposed to white faced breeds appear to be more susceptible however further research in this area is required.

Following the diagnosis at postmortem, ten lambs from the same group were sampled for 25 hydroxyvitamin D (25(OH)D), the metabolite widely used to assess vitamin D status and all were found to be low. Blood sampling was also carried out in hoggs from a further four affected flocks with similar results.

Vitamin D supplements are available however to date there is limited information on their use and efficacy. Future work is planned to learn more about rickets in sheep and the best management practices to minimise welfare and economic impacts. This work demonstrates the value of the surveillance network and collaboration with other institutions.

## SRUC Disease Surveillance Centres

| | |
|---|---|
| Aberdeen | 01224 711177 |
| Ayr | 01292 520318 |
| Dumfries | 01387 267260 |
| Edinburgh | 0131 5353130 |
| Inverness | 01463 243030 |
| Perth | 01738 629167 |
| St Boswells | 01835 822456 |
| Thurso | 01847 892602 |

Head of Veterinary Services: George Caldow
T: 0131 535 3139 E: lorna.drysdale@sac.co.uk
SRUC Veterinary Services
Allan Watt Building Bush Estate, Penicuik EH26 0QE

We are pleased to have comments from readers on the usefulness of this publication and if you have topics you would like to see covered in future issues.
**www.sruc.ac.uk**

Reports are published monthly in the Veterinary Record highlighting the disease surveillance findings in Scotland. These are available at http://www.sruc.ac.uk/downloads/120613/monthly_reports

This newsletter is circulated twice a year to livestock producers throughout Scotland to increase awareness and may give ideas for your health plans. Funded by the Scottish Government as part of its Public Good Veterinary and Advisory Services.
SRUC is a charity registered in Scotland, No. SC003712

 437303AD20.8.2020

The Scottish Government
Riaghaltas na h-Alba