Implications of Climate Change for Farm Animal Health and Welfare

The predicted changes in climate for the Cheviot Hills landscape present issues and implications for farm animal welfare and veterinary management considerations.

The generalised climate change trends suggest that the farming and land management community are going to be experiencing:

- Increased temperatures – estimated mean temperature rise of 1.2°C in winter and 1.5°C in summer
- Reduced summer rainfall – estimated at 4% reduction in mean precipitation
- Increased winter rainfall – estimated at 5% increase in mean precipitation
- More extreme weather events – in terms of frequency and severity (figures taken from the UK Climate Projections Report (Jenkins et al, 2009) in relation to the North East of England under the high emissions scenario)

Cheviot Futures has been working with local veterinary contacts from the Alnorthumbria Veterinary Group to explore the implications that predicted climate change effects are likely to present for livestock farmers within the Cheviot Hills.

Increased temperatures and reduced summer rainfall in combination are likely to present issues such as:
- Heat stress in livestock – affecting the resistance and resilience of individuals and flocks/herds as a whole
- Reduced availability of clean fresh drinking water from natural sources – which can have potential impacts on milk production with associated effects on youngstock liveweight gain
- Changes in grass productivity and palatability, potentially affecting performance to positive or negative effect
- Increased density and distribution of tick vectors that transmit diseases such as Louping ill and Lyme disease as a result of longer periods of activity associated with warmer spring and autumn conditions.

Increased winter rainfall and wetter conditions linked to extreme weather events and associated flood risk in combination are likely to present issues such as:
- Increased incidence of Fluke (including issues on farms with no history) in both sheep and cattle, and the associated problem of increasing resistance to Triclabendazole flukicide – see focus feature below

Climate change presents issues for animal welfare management, including problems linked with managing stock on wet ground.
Changes in management may contribute to an increased disease risk – e.g. increased need for, or earlier housing, and/or supplementary feeding, particularly from troughs, making it easier for disease to spread among animals.

More extreme weather events may mean more frequent sudden storms, leading to increased flood risk or even prolonged harsh weather and snow. These effects may result in impacts such as:

- Increase in the incidence of mycotoxin toxicity from mouldy feed
- Periods of extreme weather and snowfall threatening stock survival and increasing feed costs
- Veterinary treatments not getting the chance to be effective – e.g. pour-on ectoparasiticides being washed off earlier than expected due to extreme weather patterns (anecdotal only).

Increased temperatures in general are likely to present issues such as:

- Increased prevalence of pests and diseases due to increased reproductive capacity of vectors, and changes in the survival rates of disease agents – e.g. sheep scab mites, ticks, worm eggs
- Wider geographic range of virus issues such as Schmallenberg and Bluetongue, linked to insect survival and movement capacity
- Emergent pest and disease problems as our climate changes and offers climatic range to new vectors – the overall effect may be an increase in pest and disease pressure, or a shift in pressure as some vectors shift northwards to be replaced by alternatives.

The response to the potential impacts on animal health and welfare are likely to be as a result of the cumulative impacts of climate change effects. The efficacy of veterinary treatments is one element of this, existing products and approaches may be less effective as a result of a generalised increase in disease pressure, difficulties of administering products effectively, emergent issues requiring rapid scientific development of treatments (for example the current development of effective vaccines against Schmallenberg), or problems of resistance.

What can farmers do to become more resilient to the welfare issues presented?

There is a need for a risk management approach to be taken to animal health and welfare, to be better placed to cope with extremes, atypical conditions and the effects of climate change. For example, making the most of available preventative measures, and being able to respond quickly with management alterations such as earlier housing, additional supplementary feeding and veterinary treatments.

Farmers are encouraged to undertake Farm Health Planning as a general rule, working closely with their vets to identify animal health and welfare issues and take a proactive planning approach to their management. However, with the effects of a changing climate, certain elements may become more of an issue or new threats may become apparent, which could mean amending management practices to take account of the changing climatic conditions.

In order to consider climate change in Farm Health Planning it is important to take a long term approach. Reviews of health plans need to consider emergent issues linked to climate change and recognises management changes associated with this. This may mean seeking alternative treatment options, development of vaccination programmes or alteration in the timing of treatments.

Issues such as heat stress and pneumonia could be partially mitigated by increasing the availability of shade and shelter across farm holdings. This could be offered in the form of strategic native tree planting to act as shelterbelts and windbreaks, also offering shade in hotter conditions (see Strategic Native Planting case study). Ensuring a consistent supply of drinking water can be assisted by installing additional and alternative supplies to reduce the reliance on natural watercourses which may not carry the same volume of water in future – by reducing access to watercourses the risk of fluke and Cryptosporidium-linked welfare issues may also be reduced.

WELFARE FOCUS

Management of liver fluke

Due to the very wet summer and autumn of 2012, Liver fluke infestation (fasciolosis), especially in sheep, has been a massive problem over the autumn and winter. Liver fluke can infect cattle, sheep, horses, goats and llamas.

Fluke is a production limiting disease of cattle and sheep. Sheep are more susceptible to disease and death from fluke because their livers have less repairing ability and tend to scar more easily than cattle livers. Liver rejections at slaughter for cattle have been running at 40% nationwide this winter which gives an ideal of the extent of the fluke problem.

Epidemiology

Fasciola hepatica infects the liver in both cattle and sheep. For part of its life cycle it inhabits the snail, Lymnaea truncatula. This important stage of the parasite life cycle necessitates wet and warm conditions (above 7 - 10°C) during the summer/autumn months. Once the snails on a farm become infected, that farm will need to have a fluke control plan every year unless wet areas can be fenced off or drained.

Liver Fluke Life Cycle

Liver fluke (Fasciola hepatica) is a flat, leaf-like (3.5x1.5mm) parasite found in the liver of grazing animals. Eggs from adult female fluke pass in the dung to contaminate pasture.

When conditions are suitable – damp and warm (above 10°C) – the eggs hatch to form mobile larvae that seek out mud snails to complete their life cycle.

The presence of the amphibious mud snails determines the distribution of fluke. So the highest risk grazing areas are wet areas around pools of water.

The larvae multiply in the snails and emerge to attach to the grass as cysts. The grazing animal ingests the cyst where it breaks out as an immature fluke to make its way to the liver.

The fluke tunnel through the liver and if conditions favour, then a mass hatch and infection can cause severe and permanent damage.

The veterinary profession has a unique role in combating the effects of climate change and understand issues and take a proactive planning approach to their management.

An absence of fluke symptoms and a lack of farm history is no reason to leave fluke risks unmonitored. A fluke control strategy is still recommended.

The Role of the Veterinary Surgeon

(Information taken from the RVU Policy Brief: The Role of the Veterinary Surgeon in Responding to Climate Change)

The veterinary profession has a unique role in combating the effects of climate change, through:

- Disease detection and diagnosis – in the front line of disease diagnosis on the farm, in the clinic, laboratories and in universities
- Protecting public health – giving advice on the risks from animal pathogens in forests, hills, farms and recreational areas
- Preventative measures for disease – working with others to develop strategies to deal with diseases associated with climate change
- Minimising the impact of animals on climate change – through farm health planning and disease control to minimise methane emissions by maximising animal unit production
- Protecting food safety – through assessing livestock keepers about the prevention and control of current and future food-borne safety hazards.
Liver Fluke in sheep

Consequences
- Sudden deaths with acute fluke
- Less severe (sub acute fluke) may have rapid loss of condition and poor fleece quality, depression, anorexia and weakness may be seen
- Chronic fluke infestation – very poor body condition score and poor fleece quality and some but not all have “bottle jaw”, poor scan results.

Diagnosis
- Blood tests in sick ewes for liver damage will help diagnose fluke infection
- Check fresh faeces for fluke eggs, ideally from 6 – 8 ewes, in late winter
- Post-mortem will be able to detect liver fluke and is recommended especially if other sheep are lethargic and difficult to gather.

Treatment
As a general flock health plan guide treat sheep for fluke twice yearly, pre-tupping and mid-winter. But in order to use the correct product at the correct time of year, an understanding of the age of fluke each product kills is necessary (see table).

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Triclabendazole is the only product which kills very immature fluke and should be ideally used when sheep are still picking fluke up off the pasture (October – November). Usually when the temperature drops below 10°C, fluke are no longer active, therefore a mid-winter fluke dose can be another product that does not kill early immature fluke. We are recommending that farmers treat pre-tupping with Triclabendazole and mid-winter with Flukiver. There have been cases in the local area of Triclabendazole resistance. We were first alerted to a failure of pre-tupping fluke treatment on some farms due to sudden deaths in ewes and ewes in poor condition. Investigations found sheep still harboured large numbers of fluke despite being drenched properly. This emerging resistance is one of the reasons we are advising using a drench other than Triclabendazole mid-winter in order to reduce pressure. Fluke avoidance strategies such as avoiding grazing wet land with sheep in the autumn, fencing off wet land, drainage etc. should be adopted as part of a fluke control strategy. Individual farm flock health plans should be tailored to your farm with the help of your vet.

Liver fluke in cattle

Consequences
- A low grade infection of just 100 fluke has been shown to reduce milk yield by 400 litres/cow/lactation, 1000 per lactation at 25ppl
- Heavily pregnant dry cows in poor body condition can experience a fluke-associated nutritional challenge in late pregnancy
- Calf birth weights for fluke-infected cows can be up to 10% lower
- Youngstock will experience poorer growth rates giving reduced efficiency for the rearing of replacement heifers
- Fluke infection (fasciolosis) can reduce feed conversion and depress appetite (dry matter intakes can be reduced by as much as 11%). This nutritional stress depresses fertility and compromises the cow’s immune status
- In essence fluke infection can reduce lifetime performance
- Fluke infection can also precipitate other infectious diseases such as the Clostridial infection ‘Black Disease’ or it can compound outbreaks of Salmonella

Diagnosis
- Fluke diagnosis is not straight forward and needs careful interpretation, so speak to your vet
- Fluke egg counts from faecal samples indicate infection but egg production is sporadic
- Blood sampling a random group (young homebred stock would be a good indicator) can reveal the evidence of fluke infection
- Post mortem/slaughterhouse feedback provides a direct report of fluke level in condemned livers. Many more abattoirs are doing this now.

Treatment
Treatment is very effective but needs to be targeted to the fluke season and to recognise the variable efficacy of product for the different stages of fluke (early immature, immature and adult). Fluke treatments come as drenches and injections, and are also available in combination with wormers. The recognition of fluke and a strategic approach to treatment should be a component of herd health plan reviews. A little investment will go a long way to alleviating the production loss.

Further information
A useful reference point for further information is the National Animal Disease Information Service (NADIS) www.nadis.org.uk
As well as providing detailed information on disease risks and veterinary management advice, NADIS also prepare a monthly Parasite Forecast for farmers, based on detailed Met office data. The Parasite Forecast outlines the parasitic challenges facing cattle and sheep, across different regions of the UK. It is used to promote SCOPS recommendations in a seasonal context, and underlines the importance of parasite control being part of a veterinary health plan. National Parasite Forecasts are being developed for England, Scotland and Wales.
The British Veterinary Association has produced a Policy Brief – ‘The Role of the Veterinary Surgeon in Responding to Climate Change’, used as a key reference in the compiling of information for this case study.

www.bva.co.uk

The local veterinary contacts (farm practice) for the Cheviot Hills area are:

**Alnorthumbria Veterinary Group**
Rothbury – 01669 620 638
Wooler – 01668 281 323
Alnwick – 01665 510 999

**Cheviot Vets**
Brandon White House Farm, Powburn, Alnwick
01665 578 728
vets@cheviotvets.co.uk

**Merlin Veterinary Group**
Kelso – 01573 224 496
Galashiels – 01896 753 759
Duns – 01361 883 266
enquiries@merlinvet.co.uk