SUMMARY ARTICLE

Climate Change Pests and Disease: Livestock and Grassland

Building resilience to both pest and animal disease pressure in light of expected climate changes will be key in safeguarding the future productivity of the livestock sector in the Cheviot region.

In order to plan adaptation and mitigation strategies we need to be able to both predict the change in parasite risk, and determine the efficiency of different control strategies under future climate change scenarios. This requires the development and application of long-term parasite forecasts using different modelling approaches. Alongside this is the need for proactive interpretation of this data and practical adaptions.

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Impacts of Climate change on Animal disease in the Cheviots

The table below summarises the impacts that climate change is predicted to have on the main animal diseases in the Cheviots.

Disease	Expected impact of climate change on the main animal diseases
Anthrax	Heavy rainfall after drought may help bring spore forming bacteria and risk Anthrax spores to the being brought to the surface.
Botulism	Drought creating shallow water may bring risk of outbreaks of diseases in wild birds which could be passed to livestock.. Hot summers provide suitable growth temperatures for some diseases and pests.
Endemic diseases, *E.Coli O157, Toxoplasma, Salmonella*	Increased flooding causing more transmission by faecal-oral routes. Wet conditions favour further faecal-oral transmitting. Lower environmental survival of disease in warmer conditions.
Lungworm, Gastrointestinal parasites	Development and spread of larvae enhanced by wet summers
Listeriosis	Increased soil contamination in silage.
Midge spread viruses	Increases risk of midge survival and therefore vector spread.
Liver Fluke	Warm and wet conditions allow the snail hosts to thrive. Alongside wet conditions this will create a longer infection period. Dry ground conditions reduce pond snail populations helping break the parasite lifecycle

Potential Adaptions for livestock pest and disease control:

1. **Better use and development of forecasting tools**

There is already much success in using forecasts to predict fly strike. Look out for fluke forecasts these will advise if extra treatments are needed. See www.nadis.org.uk and www.scops.org.uk

2. **Improving understanding of the range of diseases out there and the identification of these diseases.**

It is essential to know what diseases may be present on farm and how they can be treated. Maintaining a link with current information from vets, advisors or forecasts will be important. Testing may be useful to avoid misdiagnosis.

3. **Improving understanding of the range of treatments available.**

Treat with the right product at the right time of year – For instance not all Flukicide products are suitable for use in autumn and early winter. It is important to match the treatment to the stage of the parasite you are dealing with.

4. **Health Planning.**

Health planning will help to highlight areas of poor productivity and underlying disease that may otherwise not be noticed.

5. Vaccination

Effective vaccination and quarantine strategies reduce the spread of infection across the country. Adopting closed herd/flock policies avoids buying in additional health problems.

6. Faecal Egg Counts

Checking parasite burdens to ensure it is sufficient to warrant treatment will ensures the problem is indeed actually what was expected and also that excessive chemical treatment is not taking place, building resistance.

7. Consideration of grazing options/timings

Avoid or fence off the wettest areas of grazing to reduce infection risk and identify lower risk areas of grazing and use these for sheep in the autumn. Clean grazing practise can be used to reduce burdens.

Potential adaptations for grassland :

1. Optimum grazing management to reduce weed ingress.

Regular grazing and cutting reduces the impact of broadleaved weeds and reduces perennial weeds like thistles and nettle. It can also reduce disease build up; typically disease moves in when pasture grasses get long and laid.

2. Correct soil structure.
Ensuring fields have good soil structure will aim grass growth. Poaching damages the sward surface allowing weed species, such as rushes in upland areas, to take hold.

3. Drainage

Waterlogging restricts the accessibility of fields for grazing because of increased susceptibility to poaching, which in turn leads to more weed ingress. Wet areas are also prime breeding grounds for intermediate parasites hosts such as snails.

4. Improve soil fertility to favour productive grasses.

It is important to ensure adequate soil fertility: pH, lime, phosphorus and potassium. Soil P and K levels should be maintained and pH does should not fall below 5.8.

In order to cope with the changing prevalence and distribution of livestock parasites, opportunities for control need to continue to be explored and researched. In particular focus should be given to modelling and forecasting potential disease and pest risks in the UK and building into these models the capability to adjust variables such as changes in stocking patterns. Of equal importance is ensuring that the land managers have the knowledge and understanding of pest and disease to allow recognition of disease and appropriate treatment. It is important to disseminate information about the steps that can be taken to alter farm management to build resilience to pest and disease. Cheviot Futures and similar organisations will have an important role to play in spreading this message.