

# Best practice guidelines for LIV control in sheep flocks and on grouse moors in the absence of a vaccine



## LIV summary

- Louping ill is a disease caused by a virus (LIV) which is transmitted by ticks. The disease is principally seen in sheep and red grouse
- Ticks become infected when they feed on a host animal with high levels of LIV in their blood. These high levels only occur in sheep and grouse for a maximum of five days following infection
- Adult sheep which are vaccinated or previously exposed to infected ticks tend to be immune. Lambs of such ewes are protected for the first 2-3 months of life by colostral antibodies
- As long as the lamb receives enough colostrum after birth, maternal colostral antibodies from hefted ewes can provide good protection for lambs against LIV but not Tick Borne Fever (TBF)
- LIV and the agent of TBF can be transmitted by the same tick or by different ticks present in the same habitat, giving rise to co-infections
- Exposure to LIV and TBF concurrently in an unprotected sheep will usually result in neurological symptoms and death
- As well as these co-infections, stress associated with handling, dosing and vaccination can lead to symptoms of louping ill being displayed



## Advice for management of sheep flocks in the absence of a LIV vaccine

Liaise with your vet to develop a working tick control plan for your individual farm and circumstances. Some points to consider:

- A high risk area could be considered as one where the total tick burden on an untreated sheep is greater than 20 and LIV prevalence within the sheep flock is greater than 10%
- Effective tick control is essential in high risk areas to reduce tick numbers and hence LIV and if aiming to reduce tick on other species
- Expose young lambs to tick in the spring to ensure exposure to TBF while lambs are protected against LIV by maternal colostral antibodies
- Ideally undertake this exposure away from core moorland, if there is a red grouse management interest
- If you lamb in-bye and later put lambs to the hill, remember they may not have been exposed to tick or LIV
- Weigh up the benefits of minimising disturbance and handling of sheep when ticks are most active i.e. temperatures over 7°C and in the peak times of spring and autumn
- Weigh up the benefits of frequent acaricide treatment against the stress of gathering e.g. is the hill high or low risk for tick/LIV?

### **Acaricides (tick killing chemicals) are the main form of tick control:**

1. **Plunge Dips:** Diazinon (an organo-phosphate or 'OP' chemical)
2. **Topical applications:** Deltamethrin, alpha-cypermethrin and cypermethrin (the synthetic pyrethroid chemicals)

### **Advantages and disadvantages of treatments**

Product type	Advantages	Disadvantages
Plunge dips	Immediate and effective treatment. Protects against sheep scab, blowfly strike, lice and keds	Operator safety, environmental toxicity and legal controls on use and disposal
Topical applications	Longer protection and easier to administer	No immediate tick kill

**Consult your vet and/or farm or moor advisor for advice on best tick control practice on your farm:** Consider methods of application; duration of action; meat withdrawal; age of animal and if any other parasite control is required. Use suitable personal protective equipment when using these products.



## Treatment in lambs

Best practice advice is to expose young lambs to ticks early in life while under the protection of maternal colostrum antibodies, but if it is necessary to prevent tick numbers building up, spot-on treatments can be used in lambs from birth and pour-ons if the lamb is over a week old. It is critical to check the product data sheet for dose rates and withdrawal periods as products vary.

## Don't forget the tups and cattle

- Purchase tups whenever possible pre-exposed to tick, otherwise use non-exposed tups in-bye to limit tick bites if possible. Tups can be checked to detect antibody to LIV, which will indicate previous exposure to the virus
- If it is not possible to purchase tups pre-exposed to ticks: Expose them to ticks at least 60 days prior to tugging as TBF will cause temporary infertility. Treat for ticks before releasing on to the hill
- Cattle grazing the hill will need to be protected from ticks and LIV by using a pour on until they gain immunity and regularly after this if control of tick numbers is to be achieved

## Factors impacting on the efficacy of tick control treatments

1. Although there is currently no evidence of chemical resistance to treatments in ticks in the UK, using both dipping and topical applications in a season will reduce the chance of the tick population developing resistance to the effective chemicals
2. Current advice for persistence of chemical treatments is 4-10 weeks for pour on and spot on treatments (depending on the product used) and repeat OP dip 6 weeks later if the infestation is severe. Note that the efficacy of all treatments decrease with time
3. Always follow manufacturer's instructions and consult product data sheets
4. The correct method of application is critical to the product used

## Biosecurity

Best biosecurity practice should be followed for tick control - if you don't have it, don't buy it in

- Quarantine and treat all incoming stock whether newly purchased or returning from wintering or summer grazing – a 3 week quarantine will cover sheep scab, worms and liver fluke as well
- Always obtain details on previous tick exposure from previous owner/grazier and use these to form a tick control plan with your vet
- Diagnostic tests are available to indicate if the animal has had exposure to LIV
- Practice good hygiene in sheds that have housed quarantined animals



## Wildlife and habitat management

- Where sheep are present on grouse moors, regular treatment with acaricides can be locally essential in preventing losses of grouse chicks to tick biting and LIV
- Other moorland wildlife, such as deer and mountain hares, can act as alternative tick hosts (though they do not replicate LIV). A holistic view to wildlife management is essential for optimal tick control where sheep are used as tick mops
- Counting tick burdens on untreated sheep, grouse, hare and deer can identify areas of high risk to these and other species
- LIV prevalence can be tested for in blood samples taken from shot grouse or from live sheep. This information can be used to identify whether extra acaricide treatments may be needed
- Habitat management should be addressed as part of tick control management with bracken control, deer and sheep fencing if appropriate

### Personnel involved with the development of Good Practice Guidelines

Name	Organisation
Beth Wells	Moredun Research Institute
Mara Rocchi	Moredun Research Institute
Hugh Reid	Moredun Research Institute
Matt Colston	Elanco
Bridget Girvan	MSD
Ian Gill	Veterinary Surgeon, Livestock Health Scotland
Adam Smith	Game and Wildlife Conservation Trust

**For further information:** [www.moredun.org](http://www.moredun.org); [www.gwct.org.uk](http://www.gwct.org.uk)