



Icelandic Sheep Breeders of North America

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Bluetongue Virus in Sheep

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Introduction

Last July, my yearling Icelandic ram "Grey" became sick and died within five days after symptoms developed. Post-mortem results were somewhat inconclusive, but a blood test revealed that he had been exposed to the bluetongue virus. Since I was unaware that bluetongue was in our area, and was generally ignorant of the disease, I researched the virus. The following article is a summary of what I found.

The Bluetongue Virus

Bluetongue is a non-contagious, insect-transmitted disease of ruminants. Cattle are thought to be the primary reservoir ("carrier") of the virus, as their general health is not affected except in rare cases. However, sheep infected with bluetongue are capable of producing severe clinical signs.

Transmission of the virus requires a very small biting midge, *Culicoides varipenis*, as a vector. *Culicoides* is attracted to the soil-water interface, so it can be found near irrigation ditches, marshes, irrigated pastures, etc. It is nocturnal, but primarily active at sunrise and sunset. In the Susanville area, this species is mostly active during summer months, and becomes dormant after the first "killing" frost in fall. Subsequently, bluetongue outbreaks generally occur August through early October. In mild climates, where the midge stays active all year, outbreaks can occur any time.

Bluetongue virus in sheep causes an increase in permeability of blood vessel walls, permitting leakage of blood constituents into the surrounding tissue. This results in swollen ears, muzzles, and coronary bands, and also pulmonary edema. Clinical signs include high temperature the first few days (106-108 degrees F), swollen lips, swollen and droopy ears, swelling beneath the jaw, swollen tongue, inflamed coronary bands, and ulcers in the mouth and tongue. Affected sheep usually will not eat or drink. The course of the virus lasts from 10 to 15 days, although symptoms may last for several weeks. Sheep may recover from the virus, although there are reports of between 5-80% mortality in affected flocks. Once infected, sheep will not likely get the disease again (assuming they survive).

There is not much evidence that sheep could be "carriers" of bluetongue. Sheep are not a "normal" host for the virus so usually the virus is eliminated (if the animal doesn't die). According to John Glenn (Veterinarian, UC Davis), it may be possible for a sheep to be a carrier, but that would be a very rare occurrence. Cattle, on the other hand, are the "normal" host for bluetongue. Cattle may become infected, never show disease, but yet have circulating virus for long periods of time. He says this is likely how the disease persists in cold climates.

Twenty-four different strains of the bluetongue virus are found world-wide; five of these are found in the United States (types 2, 10, 11, 13 and 17). In general, the disease is most common in the western and southern states. Three of the strains are common in California (types 10, 11, 17). A fourth strain has been identified in California, but is rare.

Sheep breeds native to endemic areas are probably more resistant to bluetongue than breeds from

bluetongue-free regions. For example, breeds native to Africa and Asia (where blue-tongue historically occurred), such as Karakul and Black Head Persian, are more resistant than European breeds.

Prevention of Disease

1. House the sheep indoors at night during summer months. Apparently *Culicoides* does not like to go inside unlighted buildings (even unscreened barns). Placing sheep in the barn every night at least 30 minutes before sunset and held until 30 minutes after sunrise is very effective in preventing blue-tongue infection.
2. Routinely spray the flock with insecticides, or use insecticide ear tags during the bluetongue season.
3. Vaccinate. Currently there are vaccines for the three strains common in California (10, 11, and 17). There are no vaccines available for the other strains. The vaccines are available in 100-dose packages and can be purchased from the California Wool Growers Association. Price of vaccines for each strain is about \$0.32/animal (for all three strains about \$0.96/animal).

Vaccines should be administered in spring or early summer, as it takes about 3 weeks for them to become effective. Pregnant ewes should not be vaccinated, as it may cause birth defects. Once vaccinated, the sheep would likely be protected for 3-5 years.

Additional Notes

Post-mortem results on my yearling ram were inconclusive, but tests showed positive for bluetongue and there was some liver damage (not indicative of bluetongue). He had several symptoms of bluetongue (swollen muzzle, mouth ulcers, pulmonary edema), but July is early for bluetongue and it usually doesn't cause liver damage. Local veterinarians Tom Pyle and "Doc" Tangeman (retired) both suspect he died of bluetongue; after reading the pathology report and hearing about the ram's symptoms, UC Davis Veterinarian John Glenn concurred (although plant poisoning cannot be ruled out).

Regardless of cause of death, I know that my ram had been exposed to the bluetongue virus. Because my ram tested positive for bluetongue, I know that: 1) there are likely cattle in my area that are carriers of the bluetongue virus; and 2) we must have *Culicoides* present in the area. Either the disease was recently brought into my specific area via new cattle herd, or the disease has been in my area and this is just an "outbreak" of the disease. (Doc Tangeman told Tom Pyle that over the past 45 years or so sporadic outbreaks of bluetongue disease have occurred in different locations throughout the greater Susanville area).

Since my Icelandics are relatively rare, I'm not willing to take the risk of losing more sheep (plus I suspect they may be more susceptible to the disease than my domestic breeds of sheep). So I am vaccinating my sheep as a preventative measure. According to John Glenn's recommendation, I vaccinated all sheep and lambs last year, and will vaccinate all new sheep and lambs this year. He suggests revaccinating the original sheep in 3-5 years.

This treatment is problematic in that I have only a small flock and the vaccines are sold only in 100-dose vials. Once the vial is rehydrated, it is only effective for six to eight hours. If I have to buy 100 doses each year just to vaccinate a few replacements, it would be a tremendous waste, not to mention the cost. I have contacted a few sheep breeders to see if they are interested in vaccinating, but so far most in the area have not had the problem with bluetongue, and feel the vaccine is too expensive. (Most sheep breeders in our area have local domestic breeds and crossbreds, which can be replaced for \$45-\$75). I have tried to lobby the manufacturer, with the assistance of the California Wool Growers Association, to produce the product in smaller quantities. The manufacturer's response is that producing smaller doses would be extremely difficult; it can be done but the cost for a 10-dose vial would still be about the same as producing a 100-dose vial (apparently several extra procedures would be involved to dilute the virus, etc.).

I'd be interested in hearing if any other Icelandic breeders have encountered the bluetongue virus. Also, I wonder if any research has been done regarding the susceptibility of Icelandic sheep to bluetongue, compared with other breeds? Please feel free to contact me with this information.

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