Bluetongue

Bluetongue is an insect–transmitted, viral disease of sheep, cattle, goats, and other ruminants, such as white–tailed deer and pronghorn. It is particularly damaging in sheep; half the sheep in an infected flock may die. In cattle and goats, however, bluetongue viruses cause very mild, self–limiting infections with only minor clinical consequences.

A bluetongue virus infection causes inflammation, swelling, and hemorrhage of the mucous membranes of the mouth, nose, and tongue. Inflammation and soreness of the feet also are associated with bluetongue. In sheep, the tongue and mucous membranes of the mouth become swollen, hemorrhagic, and may look red or dirty blue in color, thus giving the disease its name—bluetongue.

The Office International des Epizooties (OIE), the international animal health standard setting organization, considers bluetongue to be an OIE List A disease, which means that it has the potential for rapid spread and has major significance in the international trade arena.

For about 25 years, the presence of bluetongue viruses in the United States has blocked the export of U.S. cattle, sheep, and goats to many major world markets. Currently, these markets include Australia, New Zealand, and the European Union. Canada accepts U.S. cattle, but requires rigorous testing before the animals may cross the border.

Bluetongue was first recognized in South Africa in the late 1800s, but it was not until the early 1900s that it was described in detail. The disease was reported in Cyprus in 1943 and subsequently in Israel, Turkey, Spain, Portugal, Pakistan, India, and the United States during the 1950s.

Bluetongue is a seasonal disease generally observed in the late summer and early fall in the United States. Virus transmission begins in the early spring with the onset of insect flight activity and continues until the first hard frosts.

How it Spreads

Bluetongue viruses are spread from animal to animal by biting gnats. In the United States, the disease is most prevalent in the southern and southwestern States. It is almost non–existent in the upper North Central and northeastern States, where biting flies do not appear able to transmit the viruses.

Animals cannot directly contract the disease from other animals.

Clinical Signs

The severity of signs in an animal infected with bluetongue viruses depends on the virus serotype, the infecting dose of virus, and the age, condition, and resistance of the animal. Bluetongue should be suspected when a number of sheep or cattle show several of the following signs:

- Depression with heavy breathing or panting;
- High fever;
- Superficial hemorrhages or open sores or vesicles on the tongue, mouth, or nostrils;
- Redness of the skin, face, neck, and possibly body;
- Lameness accompanied by an engorged red dish–blue area around the base of the horns and on the coronary bands of the feet;
- Loss of condition and muscular weakness;
- Loss of wool.

Bluetongue disease is not severe in cattle; less than 5 percent of adult animals usually show signs of disease. When clinical illness does occur in cattle, it is similar to bluetongue in sheep, including foot lesions, which could lead to confusion with foot–and–mouth disease. Bluetongue in cattle also closely resembles or may be identical to a cattle disease in parts of the United States known as “myotic stomatitis.”

Goats are more resistant to bluetongue viruses than sheep or cattle. However, some cases of disease in goats with signs resembling those in sheep have been reported, and bluetongue viruses have been isolated from goats.

White–tailed deer and pronghorn in the United States are affected much more severely than cattle and often even more severely than sheep. In deer and pronghorn, the mortality rate can be extremely high. Bluetongue signs in white–tailed deer are identical to those from infection with epizootic hemorrhagic disease (EHD) viruses. Both bluetongue and EHD virus infections cause a fulminating hemorrhagic disease and sudden death in white–tailed deer.

Prevention and Control

Livestock owners in areas of the United States affected by bluetongue viruses can help protect their herds from bluetongue virus infections by:

- Keeping animals indoors at night, especially at dawn, during peak hours for night–flying insects;
- Keeping flocks or herds away from areas where biting insects are numerous;

- Moving animals to higher altitudes during insect seasons;
- Eliminating breeding areas for biting gnats, which are the primary vectors and classified in the genus *Culicoides*;
- Vaccinating sheep with the appropriate vaccine.

The U.S. Department of Agriculture's (USDA) Role

The existence of bluetongue in the United States has been an impediment to moving cattle to Canada, New Zealand, and the European Union, which are classified by the OIE as being free of bluetongue; parts of Australia have been regionalized as bluetongue–free.

In an effort to gain U.S. producers greater access to Canadian markets, USDA's Animal and Plant Health Inspection Service (APHIS) has engaged in a number of activities.

In FY 2002, APHIS' Center for Epidemiology and Animal Health conducted a bluetongue surveillance pilot project in collaboration with three States and USDA's Agricultural Research Service. Up to 65 cattle in each of 120 herds in North Dakota, South Dakota, and Nebraska were bled twice, during a 2-year study, to detect antibodies to bluetongue viruses. During the summer of 2002, traps were set on 27 farms in North and South Dakota to collect *Culicoides*, a biting gnat that transmits the viruses. The farms were selected based on prior vector trapping experiences in the three States.

Very few animals in North Dakota were positive for bluetongue virus antibodies. The distribution of *Culicoides sonorensis*, the primary U.S. vector of bluetongue viruses, was limited to Nebraska and the southwest parts of South and North Dakota, similar to the distribution found in 2001.

APHIS also supported related bluetongue studies in a joint Montana–Alberta (Canada)–USDA project testing for the prevalence of bluetongue virus antibodies to evaluate the prevalence of virus exposure in selected States.

What the U.S. Livestock Owner Can Do

Livestock owners are the first line of defense against the introduction of new serotypes of bluetongue virus and the spread of existing virus. To help prevent any such introduction and to help control and eliminate bluetongue in the United States, livestock owners should inspect their flocks and herds frequently for suspicious signs and report any such conditions to their local veterinarian or to State or Federal animal health officials.

For More Information

For more information on bluetongue virus, contact
USDA–APHIS
Veterinary Services
4700 River Road, Unit 41
Riverdale, MD 20737
Phone: (301) 734–8073
Fax: (301) 734–7817
or visit the APHIS Web site at
www.aphis.usda.gov.