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Dr. David P. Olson  
Extension Veterinarian

# Pine Needle Abortion Disease in Cattle

Abortion diseases of cattle cause a great amount of economic loss to livestock producers in the United States each year. Abortion is caused by a wide variety of infectious and non-infectious diseases, including many that we know little about. One cause reported frequently in the West is pine needle abortion disease.

This disease can result when cattle feed on needles or buds of the ponderosa pine. It is characterized by abortion or birth of premature weak, nonviable calves, retained fetal membranes and subsequent severe illness in the dam. Not all pregnant cattle will abort after eating pine needles, but the disease has been known to affect as many as 50 percent of a cow herd.

Pine needle abortion is widespread wherever ponderosa pine trees are found — in the Northern Plains, Rocky Mountain and Pacific Northwest regions of the United States and in western Canada. Only limited evidence suggests that needles and buds from other pine species also cause abortion in cattle.

Pine needles were first suspected as a cause of abortion as early as 1920. Since then, research has confirmed the association between ingestion of ponderosa pine needles and abortion or birth of weak calves. Cattle are the principal species known to be affected, but the disease has also been suspected in sheep.

Cattle have been observed eating pine needles and buds by preference, even though they had access to good quality feed. This is probably rare, however. Generally, cattle will eat pine needles or buds only when they are "encouraged" by situations such as these:

- Sudden weather changes cause animals to seek shelter under ponderosa pine where they will eat the needles.
- Severe wind or snowstorms place large quantities of needles or tree limbs on the ground.

- Animals are concentrated in a small grazing area near pine trees.
- Animals become hungry because more preferred feed supplies are scarce, perhaps in fall when the grass is gone or in the spring before green-up.
- Hay is fed on the ground beneath pine trees.
- Animals are changed to unfamiliar or poor quality feed.
- Animals are grazed near slashings from lumber operations.
- Animals become bored.

Cattle that have had regular access to pine needles or buds seem to have fewer problems with pine needle abortion than those who have not had previous exposure. And cattle that have continuous access to small amounts of needles or buds during the early and middle stages of pregnancy have little problem with abortion. Under these circumstances, they seem to develop a tolerance. However, cattle in later stages of pregnancy are likely to have abortion problems if they are suddenly given access to large quantities of pine needles or buds.

## SYMPTOMS OF THE DISEASE

Pine needle abortion usually appears 1 to 3 days after pregnant cattle have eaten the needles or buds. Abortion will continue for up to 2 weeks even though cattle are withdrawn from the feed. Abortion or premature calving occurs suddenly and is occasionally preceded by a bloody vaginal discharge. Aborted fetuses usually have not undergone much decomposition. Living calves from affected dams, whether born prematurely or full term, appear very weak. They are reluctant to nurse and usually die within 3 or 4 days, despite treatment.

Many affected cows will retain the fetal membranes. Unless treated, they will become ill and may die. To treat affected cows, veterinarians will attempt

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to remove the retained membranes and will use antibiotics and supportive fluid therapy.

Affected cows usually rebreed, though severe or chronic infection apparently can result in permanent infertility. There is no evidence to suggest that the disease causes sterility, nor is there clear evidence to determine if a cow is likely to abort a second time after losing one pregnancy to pine needle abortion.

### RESEARCH CONTINUING

These and other unanswered questions about pine needle abortion are currently being studied by a number of research scientists. Included are studies to determine the exact chemical composition of the toxin or toxins that cause the disease and the manner in which the material works in the animal's system to cause abortion.

Laboratory studies with mice have shown that, in addition to causing abortions, feeding pine needle

extract in early pregnancy will result in resorption of the fetus. Such fetal resorption may also be a complication of the disease in cattle and may explain why some cows become barren.

The research also suggests that stress, such as that caused by nutritional and infectious diseases or sudden changes in management and weather, also may be an important factor making an animal more susceptible to the disease.

### PREVENTION AND CONTROL

No treatments or antitoxins are now available to prevent or control pine needle abortion once cattle have eaten pine needles and buds. The best recommendation is to prevent the disease. Keep pregnant cattle away from ranges containing ponderosa pine. Maintain the cow herd on a recommended level of nutrition, and avoid stress conditions as much as possible.