

PINE NEEDLE ABORTION

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INTRODUCTION

Pine Needle Abortion (PNA) is a problem for cattle ranchers who raise cattle in areas where ponderosa pine trees grow. Abortions caused by pine needles are most common on grazing lands throughout the western United States (James et al., 1977). Pine needles have been known to cause abortions in cattle since 1920 (James et al., 1989). PNA can cause severe financial losses to the cattle industry. Abortion rates can range from 0% to 100% (James et al., 1989).

Abortions are caused when cows eat green pine needles off trees, from windfalls, and dead needles off the ground around pine trees (James et al., 1977). Cows in feedlots have been seen eating pine needles due to boredom (James et al., 1977). Weather influences consumption of pine needles by cows, due to the availability of feed, snow cover, and grazing time (Pfister et al., 1993).

Calves aborted due to PNA are born weak but viable, meaning pine needles cause a premature parturition (Ford et al., 1992). Abortions may occur as early as twenty-four hours to as long as three weeks following ingestion of pine needles (Pfister et al., 1993). Cows usually retain the placenta after abortions caused by PNA (Stuart et al., 1989). There are also other problems associated with PNA such as metritis, peritonitis, and death to the cow (Stuart et al., 1989).

PNA interrupts the stage of development when cell division and growth are occurring rapidly (Chow et al., 1972). The stage affected is the last trimester of pregnancy during late fall, winter, or early spring. Various studies indicate that blood flow to the calf is reduced during late pregnancy by up to 60% (Ford et al., 1992; Panter et al., 1992). The reduced blood flow stresses the calf, causing a premature parturition (Short et al., 1997). The chemical in pine needles responsible for the reduced blood flow to the calf and the cause of PNA is called Isocupressic acid (Smith 1996).

DIFFERENTIAL DIAGNOSIS

PNA should not be confused with abortions caused by Foothill Abortion. PNA generally occurs later in gestation than does Foothill Abortion. PNA calves have a short hair coat, lack teeth, and are very susceptible to respiratory infections. Pine needle aborted calves may be viable if they are spotted early enough because they are born prematurely but not dead. Foothill aborted calves are typically born dead, with no chance of survival. They generally have lesions around their lips and no hair on the body with the exception of a little hair above the eyes.

SUSCEPTIBILITY

Cows are susceptible to PNA even when there are very few pine trees in the area they are grazing. The only way to prevent PNA is to keep cows away from pine trees and pine needles (Short et al., 1994). One rancher has observed that one pine tree per three acres is enough to cause PNA. Cows having access to pine needles are at risk, no matter how few pine trees they have access to.

Cows will eat pine needles off the ground or while they are still on the tree. The pine needles that are eaten off the ground are eaten because the cows are trying to eat the grass coming up underneath the pine needle cover.

Often in snowy country, the area under pine trees does not have much snow cover. Grass can easily grow in this area under the fallen pine needles.

Cows try to move the pine needles away so they can get to the grass. However, by trying to clear the pine needles away they still may ingest enough pine needles to cause PNA. This usually occurs under trees that are all by themselves with no other trees nearby. The area under these trees is not trampled on by cows trying to stay out of harsh weather conditions and provides a good environment for grass to grow.

Pine needles eaten off trees are due to snow or wind pushing branches down to a level where cows can easily reach them. Once the snow or wind has pushed the branches down, cows are able to reach up and grab a mouthful of pine needles. The reason cows eat pine needles off branches is unknown, but may be due to boredom or a diet high in protein. Upon inspection of pine trees it is easy to see that cows do eat pine needles from the branches.

MANAGEMENT STRATEGIES

Cattle ranchers have a variety of methods from which to choose to combat PNA. These may include pruning trees higher so snow and wind cannot push branches down to a level that cows can reach. All fallen pine needles around trees must be raked up as well. Other strategies include logging the trees, fencing cattle away from trees, or simply avoiding grazing areas that contain pine trees during cows' third trimester of pregnancy. The pine needle cover can be abundant under trees.

Each of these strategies carries considerable additional costs to ranchers. Also, not all of these strategies have the same effectiveness. In selecting a preventative strategy ranchers must determine what they can afford to do.

They should account for the cost of the strategy they choose and also the amount of time required to implement the preventative strategy.

Calves born after day 250 of gestation have a greater chance of survival than calves born prior to day 250 (Panter et al., 1992). These calves need to be warmed up quickly since they have been born prematurely and lack the ability to keep themselves warm. Also, some calves will need to be bottle fed since some cows have not been stimulated to produce milk (Stuart et al., 1989).

The amount of money cattle ranchers lose due to PNA depends on what costs the rancher has in the cows. Total costs including feed, pasture, veterinarian, supplements, etc., may be as high as \$421. This is just an example; actual figures will vary depending on size, and location of operation. Ranchers may also need to include other expenses to determine the actual amount lost per calf due to PNA.

At \$421 per calf, the amount a rancher can lose due to PNA can be very large. Cattle ranchers need to be aware of PNA and of the substantial costs that come with it. There are ways to deal with PNA that may cost cattle ranchers a lot of money in the short run but will save them money in the long run.

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