

Management Practices Can Help You Beat Johne's

(Continued from Page A1)

farmers with a source of uninfected animals with which to replace culled cows and, according to Yoxheimer, encourage security measures to prevent the spread of the disease.

The program, which is currently making the bureaucratic rounds, will be voluntary. In order to be in the program, farmers would need to meet several requirements including working with an accredited

infection."

There are indications that the Johne's organism can be found in the milk of infected cows. But as with in-utero transmission, this occurs most frequently in cows showing clinical signs of the disease. It is a good idea not to feed this milk or colostrum to calves.

Calves should be housed separately from adults so that ingestion of infected manure is not possible. The housing should be uphill and

of what makes detection difficult is the slow incubation period, which is two or more years. In addition, there aren't any clinical signs of the disease during the early stages of infection. Clinical signs are often brought on by the stress of calving. Sometimes, however, cows never develop clinical signs, a response that is based partially on the age of the cow at the time of infection and the dose of the organism.

Clinical signs include weight loss to the point of emaciation yet a healthy appetite, a decrease in milk production, a predisposition to mastitis and fertility problems, diarrhea, and edema, a large, soft swelling, under the jaw.

If a farmer finds one animal with clinical signs, he's probably only reached the tip of the iceberg, according to Whitlock. "If you have one positive cow with clinical

sequences that are unique to the Johne's organism. There is not enough information at this time to determine how useful it will be in diagnosing Johne's.

Steps to take

If Johne's is found in the herd, the first step for a farmer is to assess the magnitude of the problem, according to Hoffsis. He should try and find out the origin of the infected cattle. "Many times a farmer can trace all his problems to when he purchased a certain cow," Hoffsis commented.

The next step is to determine the number of cases within the herd. "When it is first diagnosed, fecal test your whole herd," he advised. "If there is only one case, don't panic but take actions to prevent more cases. Too many people who don't pay attention to the disease right away find it builds in the herd."

consider culling all offspring from Johne's-positive cows, especially those from heavily infected cows. Although if the positive cow is from valuable bloodlines, the farmer could save her genes by flushing her embryos.

While trying to eliminate Johne's from the herd, farmers are recommended to retest the herd annually until one or two negative tests are obtained. Replacements should come from known-negative herds.

A Johne's vaccine is available, however, it is not 100 percent. "The vaccine is effective in reducing the incidence or delaying the onset of clinical signs," said Hoffsis. "But some vaccinated animals may have a subclinical infection and shed organisms."

The vaccine must be given to a calf one month or younger in age as an injection in the brisket. In most states it can only be used in positive herds as it causes some problems for regulators with confusing test results. It must be administered in Tuberculosis-free herds by an approved veterinarian. In addition, some states have not approved its use.

There some side effects to using the vaccine. It can cause lumps to form at the site of the injection that vary from 1 to several inches in diameter. It may be positive on later Johne's serologic or sensitivity tests, and its use may cause regulatory problems with preparation and approval of health certificates.

"Don't use it as a replacement for management practices," cautioned Hoffsis. "If you have a choice, employ management practices first."

Johne's Disease is a confusing disease that costs American dairy farmers more than \$105 million yearly, \$6 million of that in Pennsylvania alone. Researchers are attempting to learn cures and treatments, but until they find these, good management practices are the answer to eliminating Johne's.

The last part of this series will run next week and will discuss the research being done by Penn State and the University of Pennsylvania.

If you have one positive cow with clinical signs, you probably have 6 to 12 that will test positive on the fecal culture and 15 to 25 others that are infected but can't be proved positive.

ited veterinarian, having three consecutive negative fecal tests for the herd with the tests being 12 to 14 months apart, purchasing replacements from a negative herd, and refraining from using a Johne's Disease vaccine.

According to Yoxheimer, when the program is implemented, testing facilities would be expanded by allowing Penn State and the University of Pennsylvania to test fecal cultures.

Preventative measures

Because there is no known cure or treatment for Johne's, experts only can instruct farmers and veterinarians how to control and eradicate it through management practices.

Recent studies have proven that the group most susceptible to the Johne's bacteria, *Mycobacterium paratuberculosis*, are newborn and young calves. "The resistance to infection increases with age," reported Dr. Raymond W. Sweeney of New Bolton Center. "Most calves are probably infected shortly after birth, especially if they are permitted to suckle an udder that is contaminated with manure from an infected adult cow."

Management of the disease begins before a cow freshens. She should be put in a pen used only for calving, and the pen should be as clean as possible, which usually will mean cleaning out old bedding and manure and spreading new bedding.

Farmers should try to be present at calving to clean udders if the calf will be allowed to suckle, which is an acceptable practice for known negative dams. If the dam is Johne's positive, the calf should be separated from the cow as soon as possible, before suckling. Colostrum should be fed from a bottle, according to Dr. Glen F. Hoffsis, professor of veterinary medicine at Ohio State University. "Obtain colostrum from a test negative cow or pasteurize colostrum from a positive cow," he said. "Pasteurizing colostrum is more difficult than milk; it turns to a pudding consistency, especially if the temperature (during pasteurization) gets very hot."

Transmission

Johne's is shed in the manure of positive cows, and transmission usually occurs when the manure is ingested. "It is possible, however, for the Johne's organism to pass through the placenta," stated Sweeney. "While up to 25 percent of pregnant, Johne's-positive cows had infected offspring in one study, the likelihood of transmission probably depends on the stage of the dam's infection. If the infection has progressed to the point that the cow has clinical signs, there is a much greater chance that the calf will be born with the

at least four feet away so that barnyard run-off will not reach the calves. Don't park manure handling equipment near the hutches or pens, Hoffsis warned. He cited an example where the farmer parked his spreader between two rows of hutches, and when it rained, manure from the spreader ran out and into the hutches where calves could drink it.

Young stock should be kept separate from adults until they are at least 12 months old, longer if possible. As they grow older the less likely they will become infected.

"Cattle over two years of age are not readily infected even when introduced to a contaminated environment," said Dr. Robert Whitlock of New Bolton Center. "Thus, with each additional month of age the animal becomes more resistant to infection. However, large num...

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bers of infecting organisms will overcome the age resistance."

Manure should be handled differently as well, according to Hoffsis. "All manure must be spread on fields intended for cultivation and never on pastures," he stated. "Field crops don't suck up the (Johne's) organisms. The only way it might get into the feed is if it is particularly dusty on the day you harvest."

Calves shouldn't be pastured, but if they must be, it should be on a field that hasn't been spread with manure or been grazed on by adults. Rivers and streams, or other moving bodies of water, aren't generally a concern for adult cows. "The Johne's organism can live three to five months in a stream, but this isn't a probable method of infection because the organism is greatly diluted and older cows are more resistant," said Sweeney.

Standing water, however, is a great concern, according to Hoffsis. "If the water is not moving, the dose load (of the organisms) could get high," he warned. The level could get high enough to infect adult cows.

Waterers should not be shared between adults and young stock as adults will sometimes defecate in the water. For the same reason, bunk sweepings shouldn't be fed to young stock.

Spotting Johne's

First diagnosed in the United States in 1908, Johne's is difficult to detect and none of the diagnostic tests are 100 percent accurate. Part

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signs, you probably have six to 12 that will test positive on the fecal culture and 15 to 25 others that are infected but can't be proved positive."

He estimates that one out of five cows in Pennsylvania has Johne's.

Currently the most reliable method of detecting infected animals is the fecal culture, according to Dr. Arian Zarkower of Penn State. "The main advantage of this test is that it has almost 100 percent specificity when performed in most bacteriology labs," he said.

Among the disadvantages are low sensitivity, the need for multiple testing, a long incubation period, and possible contamination of the sample. Studies have found that this test will become more sensitive if it is centrifuged before culturing. Centrifugation can increase the likelihood of contamination, however.

Other tests that have been used, with varying degrees of specificity and sensitivity include tissue culture test of certain organs, Enzyme-Linked Immunosorbent Assay (ELISA), Dot Immunobinding Assay, and Agar Gel Immunodiffusion Assay.

"There are two newer tests under development that may provide certain advantages in the diagnosis of Johne's," reported Zarkower. One is the radiometric detection of *M. paratuberculosis*. A relatively new culture procedure, this test incubates the fecal material in a solution containing a special acid. If the Johne's organism is present, it uses the acid and releases a substance that can be measured.

"This test is potentially as specific as the currently used culture method," said Zarkower. "But it requires only about 10 days of incubation time. The test is currently being evaluated and is not being widely used in part because of the highly sophisticated equipment required."

The other new test is a nucleic acid gene probe. It is based on the ability to identify nucleic acid

Most experts recommend isolating cows with diarrhea or cows that look emaciated. "But where do you isolate cows on a dairy farm?" Hoffsis asked. In one case that he cited, the farmer was concerned about spreading the disease to other adults, and so penned the positive animal with the young stock.

Isolating cows that exhibit clinical signs from other adults is not as important as keeping them away from young stock. If possible all positive cows should be culled right away. In Pennsylvania, which is one of the only states with an official Johne's program, farmers can receive indemnity for culled cows if they are in the state program.

Culling is hard for farmers particularly if the animal doesn't exhibit clinical signs. "It's difficult for farmers to get rid of two-year-olds, especially when they're producing a lot of milk," said Hoffsis. "I tell them to milk the cow through most of the lactation before culling her."

Sweeney recommended that, despite the cost, dairymen should

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Puterbaugh Named To Herdsman Position

TUNKHANNOCK (Wyoming)

—Lester Puterbaugh has recently been appointed herdsman for Sire Power's headquarter facilities in Tunkhannock, Pennsylvania. In making the announcement, Assistant Manager J. Lloyd Ebersole stated that Puterbaugh will be responsible for supervising daily barn operations at the main facility which houses the proven sire lineup and young sires entering sampling, as well as the separate mini-stud facility. These responsibilities include feeding and care of the bulls, monitoring sire health, and overseeing semen collection procedures.

Puterbaugh has been with Sire Power's barn crew since he joined the organization in December 1979. He had previously been employed with Loudon Hill Farms. In his spare time, Puterbaugh enjoys hunting, fishing, and

camping. Puterbaugh and his family have relocated to the herdsman's house at Sire Power headquarters.



Lester Puterbaugh