1951

Johne's Disease

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Recommended Citation

Larsen, Aubrey (1951) "Johne's Disease," Iowa State University Veterinarian: Vol. 13 : Iss. 3 , Article 5.
Available at: https://lib.dr.iastate.edu/iowastate_veterinarian/vol13/iss3/5

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JOHNE'S disease (paratuberculosis) is a chronic infectious disease of cattle and it is occasionally found in sheep and goats. It is caused by a small rod-shaped acid-fast bacillus, *Mycobacterium paratuberculosis* which attacks the intestinal mucosa.

This disease was first reported in the United States in 1908. Since that time it has been diagnosed with increasing frequency. Hastings, *et al.* (1927) showed 127 infected herds in 25 states. A recent survey conducted by the United States Department of Agriculture, Bureau of Animal Industry, revealed that Johne's disease exists or has existed in 454 herds in 41 states. This indicates that the disease may be gradually spreading. In addition to the 454 herds in which the disease has been reported, there probably are many other diseased herds that have not been called to the attention of regulatory officials, making it difficult to estimate the annual national loss from the disease. However, it is possible to make an estimate of the financial loss in an infected herd experiencing an average number of deaths which is about 5 percent of the adult animals annually. Using a twenty-cow milking herd as the basis, the annual loss would be as follows: If one average dairy cow were to die from Johne's disease each year, it would be worth $193.00. In addition, as observed on cases at this laboratory, she would be sick and unproductive an average of 85 days prior to death, during which time she would require feed, labor, and space that could be used for a producing animal. This loss would be $60.00. An efficient dairyman would ordinarily sell three surplus milking animals each year at the average price of $193.00 each. However, if his herd is infected with Johne's disease he would sell such animals for slaughter, since animals from infected herds should not be sold except for slaughter. Such animals would sell for $135.00 each or a total of $174.00 less than the three animals would sell for as milking animals. The total yearly loss in the twenty-cow herd is listed as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death of one cow</td>
<td>$193.00</td>
</tr>
<tr>
<td>Loss of production during illness</td>
<td>$60.00</td>
</tr>
<tr>
<td>Loss resulting from selling three animals for slaughter instead of milking purposes</td>
<td>$174.00</td>
</tr>
<tr>
<td><strong>Total annual loss</strong></td>
<td><strong>$427.00</strong></td>
</tr>
</tbody>
</table>

The annual loss shown here is very conservative, since it is assumed that the herd consists of average animals and only one animal dies each year. Actually, several animals may die each year, and few progressive dairymen and stockmen are satisfied with "average" animals. If the herd consists of high quality animals, the loss would be much greater. In addition, high producing animals are more likely to die from the disease, probably because such animals are under a heavy strain and less able to resist the infection. A profitable dairy or stock raising enterprise often becomes unprofitable.

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through losses from Johne's disease year after year if no attempt is made to control the disease.

**Symptoms**

In most herds, symptoms of the disease usually occur in only one or two animals at a time. The first clinical symptom is a chronic diarrhea which may be preceded by a gradual loss of weight for several months. The hair coat becomes rough and the skin dry. The appetite, temperature, and pulse usually remain normal. If the animal is producing milk, the quantity gradually decreases and production eventually stops entirely. The infected animal continues to scour and lose weight until it becomes extremely thin and dies. Some diseased animals may improve and gain weight for a variable period of time, only to start scouring again several weeks or months later. Animals that have once shown clinical symptoms seldom make a complete recovery. Symptoms are most likely to be observed in animals from 2 to 6 years of age. Such animals may have harbored the causative agent since calfhood and this long incubation period makes Johne's disease difficult to eradicate once it has become established in a herd.

**Post Mortem Findings**

*M. paratuberculosis* bacilli are often found in smears made from rectal scrapings obtained from an animal showing clinical evidence of the disease. When stained with an acid-fast stain, the bacilli appear as small rod-shaped organisms, usually in characteristic groups. Even though they are not found, the suspected animal should be isolated. If it dies or is killed, post mortem examination should be conducted. The mucosa in the lower part of the small intestine and in the adjacent part of the large intestine is usually several times its normal thickness and the ileocecal valve is usually enlarged. Microscopic examination of smears made from the thickened mucosa usually show numerous clumps of bacilli. The microscopic examination should be conducted by an individual familiar with the morphology of *M. paratuberculosis*, for which reason the suspected tissue is often forwarded to a diagnostic laboratory for the examination.

**Control**

Intradermic johnin, although still in the experimental stage, is used as an aid in establishing a diagnosis in an individual animal and in determining the extent of infection in the herd. When the diagnosis has been established, all animals showing clinical symptoms should be removed from the herd at once and slaughtered, since there is no satisfactory treatment for this disease. Reactors to the intradermic test may spread the disease, even though showing no symptoms themselves, thus it is a sound policy to suggest that they also be removed from the herd and sold for slaughter. If they cannot be removed at once, they should be sent to slaughter as rapidly as young animals can be raised for replacements. No animals should be sold for breeding stock as long as reacting animals remain in the herd.

Upon removal of infected animals from the herd, the premises should be disinfected in a manner approved by the United States Bureau of Animal Industry for disinfecting premises from which tuberculin reactors have been removed. All manure and several inches of top soil should be removed from lots used by the infected animals. Obviously this contaminated material should not be placed on pasture land. Low areas and stagnant water pools should be filled in or drained. Feed and water containers should be constructed in a manner that will prevent fecal contamination.

Since young calves are easily infected they should be removed from their dams the first day of life, and reared to maturity in quarters that have not been used by infected animals. Individual portable pens have been used with excellent results in preventing spread of disease to young calves.

Intradermic johnin tests should be conducted on the herd periodically. If three consecutive tests have been conducted at 6-month intervals and no reactors or clinical cases have been observed during
that time, the herd is probably free of the disease. Johne's disease has been successfully eradicated from a number of heavily infected herds by slaughtering reactors, raising young animals separately, and keeping the premises sanitary, even though an infected animal may sometimes fail to react to the test.

Further spread of Johne's disease to herds in which it does not exist can be prevented if the owners use reasonable sanitary precautions and refuse to purchase animals from herds known to harbor the disease. Observations made at the Regional Laboratory indicate that susceptible animals contract the disease by direct contact with diseased animals, their droppings, or by access to uncleaned premises vacated by diseased animals. Transmission of the disease from an infected herd to susceptible cattle on an adjacent farm by wheels of vehicles, footwear of attendants, or contaminated objects, has not been observed although it is possible that it could spread by objects such as manure spreaders contaminated with fecal material or by drainage from the infected premises to adjacent farm land.

Editor's Note: The reader's attention is directed to a case report of Johne's Disease on page 174.

References

3. Autry, K. M., Head Prof. Dairy Husbandry, Alabama Polytechnic Institute, Auburn, Ala. (Personal communication.)

Eight pounds of 50 percent wettable DDT powder to 100 gal. of water used either as a dip or spray will control cattle lice. Two treatments should be given with a two weeks' interval between the treatments.

Histoplasmosis

Practitioners report an increasing frequency in the occurrence of histoplasmosis in their canine patients. The disease is ascribed to a yeast-like organism, Histoplasma capsulatum. Autopsies indicate an enlargement of either the mesenteric lymph nodes alone, or a more generalized condition in which, in addition to hypertrophy of lymph nodes, enlargement of the spleen and liver are observed. Sometimes lung nodules are found. Marasmus, icterus, and vomiting usually precede death, although it is not always a fatal disease. There is some evidence that the disease may be inter-communicable between man and animals.

Synnematin, a new antibiotic reported by Gattshall, is said to demonstrate exceptional activity against Salmonella species. In vitro and in vivo activity in laboratory animals indicates other favorable properties.

Pink Eggs

Eggs will have their whites turned pink if the hens are fed on a diet including plants of the mallow family, among which are hollyhocks and ground-hugging weed known variously as green cheese and cheesewood. Pink-tinged whites also result if hens are fed on cottonseed meal and the eggs kept in storage for a time.

Allied Veterinarian

In Britain in 1949-1950 a total of 600,000 cows (20 percent of the total population) were artificially inseminated.

In human brucellosis, Brucella abortus produces a chronic infection; Brucella melitensis is more acute and often leads to pus formation; Brucella suis induces a disease intermediate between the other two.