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Johne's Disease

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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. In 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 success­
fully 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 pur­
c chase animals from herds known to har­
bor 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 uncleansed
premises vacated by diseased animals.
Transmission of the disease from an in­
fected herd to susceptible cattle on an
adjacent farm by wheels of vehicles, foot­
wear of attendants, or contaminated ob­
jects, has not been observed although it
is possible that it could be spread by
objects such as manure spreaders con­
taminated with fecal material or by drain­
age from the infected premises to adja­
cent farm land.

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

References

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    ton, D. C.

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 treat­
ments.

Histoplasmosis

Practitioners report an increasing fre­
quency in the occurrence of histoplas­
mosis in their canine patients. The disease
is ascribed to a yeast-like organism, His­
toplasm a capsulatum. Autopsies indicate
an enlargement of either the mesenteric
lymph nodes alone, or a more generalized
condition in which, in addition to hyper­
trophy of lymph nodes, enlargement of
the spleen and liver are observed. Some­
times lung nodules are found. Marasmus,
icterus, and vomition usually precede
death, although it is not always a fatal
disease. There is some evidence that the
disease may be inter-communicable be­
tween man and animals.

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

Pink Eggs

Eggs will have their whites turned
pink if the hens are fed on a diet in­
cluding plants of the mallow family,
among which are hollyhocks and ground­
hugging weed known variously as green
cheese and cheeseswood. 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.

Courtesy Hoard’s Dairyman

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