



# Johne's Disease

**An emerging problem  
in Ireland's cattle herds**

Advice for Farmers



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# Johne's Disease in Cattle

## What is Johne's Disease?

Johne's (pronounced Yoh-nays) disease is a chronic infectious disease, the clinical symptoms of which are characterised by chronic continuous or intermittent watery diarrhoea. While clinically ill animals continue to eat, they gradually lose condition and finally die. It is caused by infection with *Mycobacterium avium* subspecies *paratuberculosis* or MAP for short. It is a disease notifiable to the Department of Agriculture through the District Veterinary Office and regulated by the Johne's Disease Order, 1955 (S.I. No. 86 of 1955).

## How do cattle get it?

Most cattle are infected early in life by ingestion of MAP through colostrum, milk, faecal contaminated teats, water, feeds or surfaces. Calves may be infected before birth. If the cow is clinically sick with Johne's Disease then up to 50% of calves will be born infected. If the cow is infected but not clinically sick then that will fall to 10%. Calves usually develop resistance to becoming infected as they get older. Adult animals can also become infected but it is rare, and usually they have other problems such as deficiencies with their immune system.

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## When is it seen?

Typically most cases of Johne's Disease show clinical signs between the ages of two and six years and thus the disease is normally seen in cows or breeding bulls. Early development of clinical signs is usually a result of very heavy exposure to MAP such as in a heavily infected herd. The number of MAP bacteria excreted by an infected animal dramatically rises as clinical disease develops.

## What factors increase the risk of disease?

The onset of clinical symptoms may be precipitated by intensive farming systems, acid soils, poor nutrition, stress related to transport, lactation, calving and immunosuppression by other biological agents such as BVD or by deficiency of essential elements. It has been found that high yielding, high production animals succumb to the disease quicker.

## How long does the disease last?

The duration of the clinical phase varies from weeks to months. Periods of temporary improvement of symptoms may be seen and animals have a marked tendency to show apparent improvement in late pregnancy only to relapse after calving. There is no satisfactory treatment and therefore the majority of animals showing clinical symptoms will eventually die of the disease.

## What are the consequences of infection?

Animals with clinical Johne's disease have reduced milk production and weight gain. They are culled prematurely and thus their breeding potential is curtailed. There is evidence that sub-clinical infection gives rise to losses due to higher rates of mastitis, longer calving intervals, and infertility. Food conversion efficiency is reduced due to damage to the intestine.

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On average it has been found that a clinically affected animal produces 16% less milk in its last lactation and 6% less milk in its second last lactation than would have been expected.

It is therefore desirable, even from a purely economic perspective, for farmers to make every effort to keep this disease out or if already infected then to eradicate this disease from their herd. As with other diseases, the introduction of infected live animals is the most effective method of contaminating a herd therefore operating a 'closed herd' policy is to be recommended.

## How is Johne's Disease diagnosed?

Suspicion of the disease often arises as a result of a combination of factors such as:

- **Presence of symptoms**
- **Failure to respond to treatments**
- **A history of exposure to MAP or**
- **Links to imported animals.**

**Diagnosis in the later stages of infection is not usually a problem.**

**Sample materials used depend on the test methods available and include blood, faeces, and milk or post mortem tissues.**

Internationally research is ongoing in attempts to devise new or refine existing tests, to improve the early diagnosis of Johne's disease. With all tests there are however problems with specificity and sensitivity. Put simply 'Specificity' is where a test gives a false positive and 'Sensitivity' where a test gives a false negative.

Repeat tests of blood and/or faeces are frequently required to determine the true disease status of an animal particularly one considered "at risk" but not exhibiting clinical symptoms. Culture of the organism, taken as the "Gold standard" may only detect 50% of infected live animals and will take up to 6 months before results are available therefore making it of limited value in an ongoing disease situation.

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## What else should I be aware of?

Farmers with affected animals should be aware that this condition is:

- **highly contagious and**
- **can exist silently spreading within a herd for long periods of time.**

## What are the "At Risk" Animals?

"At risk" animals include:

- **those that could have been exposed to MAP but more specifically those exposed when under 1 year old.**
- **imported stock particularly if companion animals to an animal with Johne's symptoms.**
- **Farmers should, in particular be aware of clinically normal animals in any "at risk" group.**

Animals apparently normal but sub-clinically infected can shed very large numbers of organisms for long periods resulting in a highly contaminated environment.

Thus, good farming practice would dictate that farmers should take precautions to prevent this disease becoming established in or spread from their herds and thus they should be cautious in deciding to breed from or sell for breeding "at risk" animals.

## Where is the disease prevalent and should I import?

Farmers should also be aware that the prevalence of this disease is much higher in most other countries, for example in the Netherlands 20-40% of herds are infected.

In Denmark 47% of dairy herds tested positive in a bulk milk survey. In most countries with substantial intensive cattle production systems the disease is endemic although most do not have accurate data on prevalence. Farmers therefore should be particularly vigilant when introducing imported animals or their progeny to their herds. They should at a minimum require certification as recommended in the Code of Practice for Importing Animals. Many countries have herds participating in voluntary control or accreditation programmes that would provide additional assurances. Nevertheless farmers should be alert for the appearance of clinical symptoms in imported and other "at risk" animals. Unless Johne's disease is excluded as the cause of the symptoms the affected animal should be removed promptly as effective isolation is likely to prove difficult.

**New bloodlines introduced into a herd by semen or embryo importation are not considered a risk factor for Johne's Disease.**

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## What should I do to prevent or control infection?

Calf rearing management procedures for breeding animals will significantly affect the probability of success in controlling and eradicating Johne's from a farm. Hygienic calf rearing on its own will eventually eradicate Johne's from a farm whereas testing and culling positive animals on its own never will. Management practices therefore should aim to prevent calves coming into contact with faeces of adult animals.

Particular attention should be paid to the isolation of all potential breeding calves during their first year of life. Calves being reared for meat production are unlikely to develop advanced Johne's Disease infection or excrete significant concentrations of bacteria before reaching slaughter weight and as such are less important. It must also be noted that milk from an animal suffering from a visible disorder may not, in law be supplied for human consumption and therefore must be disposed of. In the case of Johne's disease such milk should not be fed to calves or disposed of in such a manner as to contaminate the calf environment.

## What is the most dangerous way of spreading Johne's Disease?

The common practice of pooling colostrum/milk from many cows and feeding this to calves is the single greatest risk factor in rapidly spreading Johne's Disease to all herd replacements.

If it is absolutely necessary, use colostrum from old healthy cows (8 years +) for calves.

Rearing calves with cows in confined spaces where the feed, bedding, cow's teats and other surfaces become heavily contaminated with faeces is also highly dangerous.

## What is the most important thing I can do?

The single most important thing any farmer can do is to manage calf rearing particularly for potential breeding animals.

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## So how should I rear my calves in a dairy herd?

- Calve cows in clean pens with plenty of clean bedding.
  - Separate the calf from its mother as soon as possible after receiving only her colostrum. This minimises the risk of infection either directly from the milk or from faecal contamination of the udder. Thereafter the calf should be reared on powdered milk replacer.
  - Pay particular attention to ensure that each calf is individually identified with its dam. If the dam is subsequently confirmed infected then the infection status and potential danger posed to the herd by her calf must be considered.
  - Rear calves in pens that have not previously housed adult animals or were at least thoroughly cleansed, disinfected and rested since so doing.
  - Offer hay as soon as possible to develop rumen function. Provide the hay from racks raised off the ground to reduce the risk of young animals eating contaminated bedding.
  - Make sure that calf housing is situated where run off (rainwater/slurry) from adult yards/housing will not cause contamination.
- Ensure that those feeding/handling calves do not wear the same boots/overalls, as when handling adult animals - ideally the calf rearer should not be involved with the adult herd.
  - Graze calves on new or clean pastures that have not been used for adult grazing or have not had slurry spread on them for at least one year.
  - Do not graze calves with or on pastures used by other ruminants.
  - Fence off access to streams/watercourses. Provide clean drinking water uncontaminated by slurry.

## What about rearing calves in a suckler herd?

The same principals apply as to rearing the calf in the dairy herd except of course that the suckler calf and its mother cannot be separated. Thus the opportunities for the calf to come into contact with faecal material from adult infected animals are magnified therefore hygiene, cleansing, bedding and overcrowding must all be addressed. On the plus side a suckler calf rarely gets milk from any cow except it's own mother.

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## Are there any other points of interest?

It has been demonstrated, in the United States, that the application of lime to pastures (increase in soil Ph) was associated with a ten-fold reduction in the risk of a dairy herd being tested positive for Johne's infection. In some countries farmers contract to have their calves reared by specialised calf-rearers in order to ensure that calves will have no contact with adult animals.

Lime should be used to treat slurry from infected herds.

The web site <http://www.johnes.org/> is a good source of information on Johne's Disease with links to many other sites on the topic.

## What if there are already infected animals in the herd?

Advice to farmers with Johne's affected or clinically suspect animals is that:

- Such animals should be slaughtered as soon as possible;
- Their milk must not be used;

- Their most recent calf should be removed or fattened and slaughtered;
- Any calves 12 months of age or under likely to be infected, or to have come in contact with infected cattle or manure should similarly not be bred but fattened and slaughtered;
- Calves that are intended for breeding should never receive pooled colostrum or milk;
- Infected manure should be stored away from cattle or spread on tillage ground; Slurry should be treated with lime-milk;
- Young animals (calves) should, preferably, be grazed on fresh ground, ideally on new grazing ground after a tillage rotation, where infected slurry or manure has not been spread in the previous season;
- Drainage from sheds where affected, suspect or cattle "at risk" of being infected are housed should be away from calf accommodation to prevent contamination of the calf's environment.



*You need to ask why is this four-year-old cow so thin, even though she is eating well?*

Contact your Veterinary Surgeon for further advice.