



# Guidance on control of Johne's disease in dairy herds

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### Controlling Johne's disease in dairy herds

Johne's disease or paratuberculosis is widespread in the major dairying areas of the world. It is a difficult disease to control. The disease can have a significant financial impact on herds through loss of output and early culling, and the welfare of affected animals is compromised.

All dairy farmers would be well advised to prepare and implement a herd health and welfare plan with their veterinary surgeon that includes a policy on the control or prevention of Johne's infection. This guidance provides essential information on Johne's disease and suggests strategies for its control in dairy herds. Control of this disease is complicated and we strongly advise discussing the situation with your veterinary surgeon before taking any action.

#### Strategy for Control of *Map* in Cows Milk

Johne's disease is caused by a bacterium called *Mycobacterium avium* subspecies *paratuberculosis*, or *Map*. It has been suggested that this organism may also be a possible cause of Crohn's Disease in humans. Such a causal link between the two conditions has yet to be proved or disproved, however the Government is taking a precautionary approach in this area. A possible route to infection in humans could be through consumption of milk containing *Map*.

The Food Standards Agency has published a strategy for reducing the levels of *Map* in milk. The strategy includes the following components:

- Hygienic milking practices
- Effective pasteurisation of milk
- Reducing the level of *Map* in dairy herds

This guidance note is aimed at reducing the incidence of Johne's disease in the UK dairy herd, and thus reducing the levels of *Map* in milk. For more information visit [www.food.gov.uk/science/sciencetopics/microbiology/mapinmilk](http://www.food.gov.uk/science/sciencetopics/microbiology/mapinmilk) and for more information on dairy hygiene refer to <http://www.defra.gov.uk/corporate/rds/shortguide.pdf>. The guidance is based on a detailed study undertaken for Defra by the Scottish Agricultural College.<sup>1</sup>

<sup>1</sup> Scottish Agricultural College: Assessment of Surveillance and Control of Johne's disease in farm animals in Great Britain. Published in 2002 – [www.defra.gov.uk/animalh/diseases/zoonoses/zoonoses\\_reports/sac2.PDF](http://www.defra.gov.uk/animalh/diseases/zoonoses/zoonoses_reports/sac2.PDF)

### Johne's disease – What you should know

Johne's disease is an infectious wasting condition of cattle and other ruminants caused by *Mycobacterium avium* subspecies *paratuberculosis*, commonly known as *Map*. It is closely related to the organism that causes tuberculosis. The disease progressively damages the intestines of affected animals, and in cattle this results in profuse and persistent diarrhoea, severe weight loss, loss of condition and infertility. Affected animals eventually and inevitably die. In dairy herds, the presence of Johne's disease will significantly reduce milk yields well before other signs of the disease can be found. Johne's disease is not a notifiable disease in Great Britain (England, Scotland and Wales), but it is notifiable in Northern Ireland.

### How is *Map* spread?

Diseased animals in general pass large numbers of *Map* in their faeces (dung). A single diseased animal can therefore pose a high risk to susceptible animals, in particular young calves in the herd. Diseased animals may also excrete *Map* in milk and colostrum. While cattle remain susceptible to infection throughout life, they are at their most vulnerable in the first few months of life. Calves may be infected in the womb but are more commonly infected through:

- drinking contaminated colostrum;
- ingesting dung that may be present on unclean teats;
- contaminated feed; and
- contaminated environment or water supplies.

The organism is extremely tough and may survive for up to a year on pasture, in slurry and in water. Other animals, particularly deer, sheep, goats and South American camelids such as llamas and alpaca, can carry *Map* and pass it in their dung. They can therefore be sources of infection where there is co-grazing or sequential grazing in the same pasture. Rabbits and other wildlife can be infected with *Map*. Although their role in the spread of disease in livestock has not been established, rabbits are currently believed to be less significant as a source of disease than infected cattle.

### How can you spot Johne's disease?

*Map* is a slow growing organism. After infection, it may be years before the infected animal becomes ill. In the early stages of infection, the only way to confirm whether an animal has Johne's disease is to carry out blood tests. These do not detect all infected animals, but at this stage are more likely to identify infection than tests for the organism itself. Signs of the disease are rarely seen before two to three years of age. Generally, there is a period of reduced milk output or fertility well before the animals begin to show signs of advanced disease. These signs include persistent and profuse diarrhoea and significant weight loss, and are seen most commonly in animals at three to five years of age. After disease has developed the diagnosis can usually be confirmed microscopically from a dung sample.

### Johne's disease – a long term problem

When a case of Johne's disease is discovered in a dairy herd, many other animals within the herd will have been exposed to infection. It is very likely that the disease will be developing in several other animals. For every diseased animal that is found in a herd, it is likely there will be a group where the disease is already affecting their milk output or fertility **and** a group where the disease is taking hold and the effects may be seen in later years. Because of the high persistence of *Map* in the environment and the long "silent" period between infection and the first signs of disease becoming apparent, it takes a long time to significantly reduce the level of infection in a dairy herd.

#### Summary of key points

- *Map* is long-lived and very persistent. It can be found in slurry and in watercourses, and standing water like ponds may be heavily contaminated.
- Cattle (both dairy and beef) with Johne's disease can produce very large numbers of *Map*, which contaminates pastures, feed and bedding. This poses a significant risk to the rest of the herd, particularly young stock.
- Other livestock, such as deer, sheep and goats, can also carry *Map*.
- Diseased cattle produce *Map* in colostrum and milk.
- Calves can be infected in the womb or, more commonly, by drinking the colostrum of infected dams, from contaminated teats or the environment.
- Once infected by *Map*, it takes a long time for Johne's disease to appear in cattle, typically at least two years.
- Once discovered, the reduction of the level of infection in a dairy herd will take several years to achieve.

### Why control Johne's disease?

If uncontrolled, Johne's disease will have a financial impact on your dairy business. Particular impacts include:

1. Milk production may be impaired before other clinical signs are evident, but the loss of production may not be recognised as due to Johne's disease. In the lactation in which signs of the disease become apparent cows can produce 25% less milk than their potential yield. In the lactation before this the reduction is 10%. By the time signs of diarrhoea and wasting are clear, milk yield will be significantly affected. Your total milk yield and thus income from the herd could be significantly decreased.
2. Infected cattle are more susceptible to other diseases such as mastitis and, because they have difficulty maintaining body condition, their fertility is poor. Treatment of these conditions is expensive, and you will have to consider the costs of replacing culled stock.
3. The capital value of your breeding stock could also be reduced if there is demand for stock or milk from herds that can be certified as tested free of Johne's disease.

### 3 Good Reasons for controlling Johne's disease

Control and prevention of Johne's disease makes sound long term sense for three reasons:

1. To reduce or prevent your production losses and income that result from this disease;
2. To increase the value of your breeding stock if your herd is certified as free of the disease;
3. To reduce the level of *Map* in milk and the environment.

### Screening your herd for Johne's disease

Because it takes a long time for signs of Johne's disease to appear in infected cattle, you may not know that it is present in your dairy herd. It is very important to look out for signs of the disease and advisable to take steps to screen the herd for the presence of *Map*. This will help you and your veterinary surgeon decide the best course of action, particularly in preparing a herd health and welfare plan.

Once an animal has severe diarrhoea and is losing weight the disease can normally be readily confirmed by a blood test or by microscopical examination of the dung. The *Map* organism can be cultured and identified from the dung, but it takes up to six months to obtain the result – too long for this to be useful for the routine diagnosis of disease. However diagnosis of the presence of the organism in animals in the silent period of the infection, before signs become apparent, is difficult. Infected cattle seldom pass detectable numbers of *Map* in their dung until they are beyond two years of age.

There is a blood test that detects the antibody to *Map* produced by infected cattle. However, cattle tend to produce the antibody to *Map* relatively late in the infection. In some individuals it may be difficult to confirm the presence of infection in the live animal. Where an infected animal is tested throughout its life it can be expected to test negative on one or more occasions before it tests positive. This also means that testing **apparently healthy** animals at the point of sale or on arrival in their new herd cannot guarantee prevention of the introduction of infected animals to the herd.

Taking these realities into account, you should consult your veterinary surgeon to develop a screening programme that best suits your business needs. For instance:

- If you believe your herd is not infected and you wish to provide a high level of assurance for certification to support sales, a regular testing programme may be appropriate. This might take the form of a blood test every one or two years on all or part of the adult herd, combined with tests on any "suspect" animals or other culls;
- If you believe your herd is not infected but wish to ensure its early detection if it does occur, then tests on suspect cases, on culled cows, or periodic screening of a proportion of the older animals in the herd may be enough.
- If you know Johne's disease is present in your herd and want to try to eradicate it, a more intensive programme will be needed in conjunction with other management controls.

Suitable testing programmes are provided by schemes that operate under the guidance of Cattle Health Certification Standards (CHeCS) for further information see [www.herdcare.com/HealthScheme.htm](http://www.herdcare.com/HealthScheme.htm) or [www.cattlehealth.co.uk](http://www.cattlehealth.co.uk)

### Herd health and welfare plans

1. It is good practice to implement a programme designed to reduce the chances of introduction of infection into the herd and spread of infection within the herd. This is true whether you know you have infection, or believe you may be free from it.
2. It is very important to develop a health and welfare herd plan in conjunction with your veterinary surgeon.
3. The control of Johne's disease on your farm needs to be considered together with the need to control other cattle infections. Improving or maintaining strict biosecurity can help control many diseases, as well as Johne's disease.

### Strategies for controlling Johne's disease

Whether or not Johne's disease has been detected in your dairy herd, you should implement a number of basic biosecurity measures, incorporated into your herd health and welfare plan. They will help stop the disease being introduced into your herd, and, should it already be present, they will help to prevent its spread to other unaffected cattle.

### Stocking

The major source of infection is the purchase of infected dairy or beef cattle or other livestock (including sheep and other species) that are not yet showing the signs of the disease. To keep the disease out of your herd or to prevent re-infection it is preferable to maintain a closed herd. If you have to bring in replacements (including stock bulls), try to obtain them from herds that are undergoing regular testing and where no evidence of infection has been found. The longer such a herd has regularly tested negative, the lower the risk of purchasing an infected animal. Herd health accredited farms are a possible source of new infection-free stock. If you cannot find a fully tested herd as a source of replacement stock or hired bulls, you should at least assure yourself that Johne's disease has not been diagnosed in the herd, and ask what tests have been carried out.

Bear in mind that embryo transfer is potentially the safest way to introduce new blood lines into your herd, provided the recipient animals are known to be free of disease.

### Clean Water

Johne's disease can spread by contaminated watercourses. You should:

- Wherever possible, provide mains water for drinking.
- If you have a private water source ensure that it is checked regularly.
- Ensure that drinking troughs are kept as clean as possible.

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- Where you are able to provide water through a mains supply or a clean private source, fence off your herd's access to ponds, streams and rivers, particularly slow moving watercourses or stagnant water that the cattle may wade in.
- If you are grazing in flood meadows or in cases where a slurry pit has been flooded, you should try to delay grazing as long as practicable after flooding has occurred and subsided.

### Pasture management

*Map* may be present in dung or slurry. Because it is a tough and persistent organism, it may be found on pasture for at least a year after slurry or manure has been applied or has been contaminated by grazing cattle. Even if manure has been well composted, *Map* may still be present. You should avoid grazing young animals on land for at least three months and ideally a year after application in order to minimise the likelihood of infection, where practical.

Deer, sheep, goats and South American camelids (including llamas and alpaca) are also susceptible to the disease. On farms where the disease is present in cattle it may spread into these animals that will then act as an infection reservoir. Infection could therefore be reintroduced to a herd through these species. You should therefore avoid co-grazing. Sequential grazing with such animals in the same grazing season should be avoided.

### Protecting calves and young cattle from Johne's disease

An important source of infection of calves is faecal contamination of the milk, teats soiled with dung, or faecal soiling on a calf's coat, which the calf then swallows when grooming itself. It is therefore important to use good hygienic practices to minimise as much as possible the exposure of young animals to dung or slurry from adult animals. This begins from the moment the calf is born. To achieve this it is highly desirable to:

1. Ensure cows calve in clean well-bedded areas. The ideal is calving boxes thoroughly cleaned and disinfected between cows. The dam's teats must be as clean as possible to prevent ingestion of faecal matter.
2. Ensure that calves are subsequently reared in a clean environment, free of adult faecal contamination.
3. Do not graze young stock on pasture where adults have grazed or where slurry has been applied in the past three months and ideally in the past year.

### If you have Johne's disease in your dairy herd

#### New-born Calves

If Johne's disease has been found in your herd, you must be aware that *Map* may be present in the milk of infected cows and is commonly found in their colostrum. When calves are born in such a herd they are particularly vulnerable to infection, and specific measures are necessary to minimise the likelihood of infection occurring.



When calves are born it is important to follow the advice in the Code of Recommendations for the Welfare of Livestock: Cattle<sup>2</sup>. However, in order to minimise the likelihood of infection you may need to consider removing the calf from its dam earlier than the recommended 12-24 hours after birth. You should seek the advice of your veterinary surgeon in advance of calving to decide when a calf should be removed, and this should be recorded in your herd health and welfare plan. **If you must remove calves from their dams early, it is essential that they are subsequently reared in a clean, thoroughly disinfected environment, free of adult faecal contamination.**

**It is also essential that new-born calves receive sufficient colostrum, so you must ensure that:**

- Calves **only** receive colostrum from their own mother, or in the absence of their own dam's colostrum, preferably **only from a single animal** that has repeatedly tested negative for *Map*.
- After receiving colostrum they are reared on milk replacer or milk that has been heated to boiling point.
- Where calves are allowed to remain with their dam, teats must be as clean as possible, to prevent ingestion of faecal matter, and the pen must be kept clean.

**DO NOT feed discarded milk to calves. If discarded milk is to be fed to calves it should be heated to boiling point.**

**DO NOT pool colostrum and feed to calves. Pooling colostrum from a herd where Johne's disease is present should, if possible, be avoided, even from cows that have tested negative. It cannot be guaranteed that an animal that has tested negative will not be shedding *Map*, and pooling colostrum will increase the risk of infecting calves. However, if you are considering pooling colostrum as a strategy, you should seek the advice of your veterinary surgeon, taking into account the particular needs of your herd.**

### IMPORTANT NOTE

**You should note that this specific action to protect calves from infection is wasted if you do not make sure that they are reared in areas free from adult faecal contamination and by carrying out the other important actions stated in this leaflet.**

<sup>2</sup> The code is intended to encourage all those who care for cattle to adopt the highest standards of husbandry. By law, all stockmen must have access to the code and be familiar with its provisions. Employers must ensure their staff receives guidance on the code.

### Herd Management

If Johne's disease is confirmed as being present in your herd you should, in consultation with your veterinary surgeon, take the following action:

1. Remove animals that have tested positive from the herd as early as possible. Removal before the animals show clinical signs of Johne's disease will minimise the exposure of other animals to the organism as the numbers of the *Map* organism shed with dung are relatively low at early stages of infection.
2. As the offspring of infected females have a high chance of being infected these should also be removed from the herd. **Do not breed from the offspring of infected animals. In the case of valuable but infected cows one option is to collect embryos and transfer them into 'clean' recipients.**
3. Ensure that the general biosecurity measures explained in this guidance note have been put in place to limit the spread of infection in the herd. It is also important to prevent further introduction of infection in replacement stock: see page 7.

The Cattle Health Certification Standards body (CHeCS) has defined the industry standard screening and control programme for Johne's disease that provides an agreed mechanism for herds to follow a test and cull programme.

### Vaccination against Johne's disease

In Britain there is a vaccine, however it is only suitable in limited situations. Consult your veterinary surgeon on a case by case basis before embarking on such an initiative as money may be wasted. It must be given to calves in the first month of life and its use will reduce the number of animals in a herd that develop the later stages of the disease. However it does not remove the infection from the herd. Animals that have received the vaccine react to the avian component of the tuberculin test, which complicates the interpretation of the herd tuberculosis test. The Divisional Veterinary Managers will be advised of vaccinated herds in their Divisions. Use of the vaccine also interferes with the Johne's disease blood test, particularly where animals are tested at two years of age. A vaccination programme will have most effect where it is combined with a management programme as described in this leaflet. You should seek the advice of your veterinary surgeon in making a decision, and update your herd health and welfare plan accordingly.

### What to do about Johne's disease: 10 steps to consider

1. Prepare a herd health and welfare plan with your vet that includes measures to control Johne's disease.
2. Remove diseased cattle from the herd as early as possible. Do not breed from their offspring.
3. With your vet, discuss screening your dairy herd for Johne's disease infection to establish if infection is likely to be present or to detect its occurrence as soon as possible. Consider removing infected cattle before the disease develops.
4. Infection is most likely to occur in the first few months of life. Put in place strict hygiene on the farm, particularly at calving. Wherever possible, rear calves and young cattle away from adult faecal contamination.
5. Make sure, wherever possible, that all calves only receive colostrum from their own mother. Do not feed pooled colostrum in infected herds.
6. As a rule, do not feed calves discarded milk unless it has been heated to boiling point.
7. Keep a closed herd, but if it is essential to buy in cattle, try to obtain stock from sources that can demonstrate they are tested free from Johne's disease.
8. Delay grazing young cattle on slurried pasture as long as possible and, if practical, for at least one year.
9. Wherever possible, provide mains water and keep troughs clean. Fence off rivers and other water sources if possible, especially ponds and other areas of stagnant water.
10. Avoid co-grazing or sequential grazing with other livestock that can carry Johne's disease infection.

NB. The points above are suggested prevention measures. Steps taken to implement them on your farm should be discussed with your veterinary surgeon.

For more information, visit [www.defra.gov.uk](http://www.defra.gov.uk) or order further copies of the Guidance Notes from Defra publications 0845 955 6000. You can also download the Guidance Notes from the Defra website.

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