

Modelling Johne's disease in Ireland

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The Irish Johne's Control Programme is engaged in several pieces of research work aimed at improving the ways that Johne's disease can be controlled in Ireland.

One research project that is just concluding has been modelling various factors related to spread of infection, either within infected herds or between herds. This project adapted an existing French computer model of Johne's disease spread to the Irish context, to see how changing certain farm management elements can influence the spread and impacts of infection. For the modelling, the Irish dairy industry compared to the French is concentrated on more seasonal, has much greater levels of movement of animals between farms, and has infection with Johne's disease occurring in fewer herds and fewer animals per infected herd.

The current study shows which reasonable and effective actions farmers can take to reduce the spread and impacts of Johne's disease.

The first set of actions relate to the movement of animals from herd to herd, which the most important factor in spread of infection between farms. An estimated 70% of Irish dairy farms are not yet infected, and maintaining these as closed herds (not bringing in any animals, including bulls) will give them the most protection.

However, many farms will continue to buy in animals for various reasons, so spread of infection will inevitably continue. The model shows that these farmers can reduce by 50% or more the likelihood of their herd becoming infected, by being selective about introduced animals. Before deciding to purchase animals, determine whether they are likely to be clear of infection. In practical terms, ask the seller if the herd participates in the Johne's programme or (CHeCS for pedigree herds) and has the herd testing results to show that the herd is unlikely to be infected. If you do not receive a satisfactory answer and factor that into your buying decision, the model indicates that you double the likelihood of your herd becoming infected.

The model also shows that the greater the number of herds that are participating in the Johne's control programme and that are selective about sourcing animals from low-risk herds, the greater the benefits, not just to the participating herds but to all herds in Ireland.

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Regarding the control of spread within infected herds, the model shows that the most effective measure is to protect calves from exposure to adult cattle and their manure. This involves a package of actions, including removing high-risk cows from the common calving area, keeping clean the calving area and cows within it, early separation of calves from cows into a clean calf rearing area, and ensuring that beestings and milk fed to calves is collected hygienically from low-risk cows and fed using hygienically clean feeders.

The next-most effective measure shown by the model is to remove cows with high-positive results for blood- or milk-ELISA testing, from the herd within four weeks. It is common practice in Ireland to retain these cows until the end of lactation, or even into the following lactation, but this increases the risk and rate of spread of infection within the herd. This suggestion to remove the cows with high-positive ELISA results is independent of the result of ancillary PCR (dung) testing. Remember that dung testing is only for the purpose of confirming the presence of MAP (the bacteria that causes Johne's disease) in the herd and that a negative result for dung PCR test does not mean that the tested animal is not infected; a positive ELISA result and especially a high-positive ELISA result suggests that the animal is infected and should be removed from the herd as soon as possible.

The model also shows that reducing stress on cows will also contribute to reducing spread of infection, by slowing the progression of infection from 'latent' or dormant to infectious or spreading.

Lastly, the model demonstrates that the best control is achieved by consistently implementing both the closed herd or selective introductions ('bio-exclusion') and the control of within-herd spread ('bio-containment') throughout the year. This is consistent with the principles of the veterinary risk assessment and management plan (VRAMP) under the Irish Johne's Control Programme.

All cattle herds, and especially dairy herds, pedigree herds and herds which have previously bought in numbers of cattle, will benefit from controlling Johne's disease. To find out more, speak to your veterinary practitioner or contact Animal Health Ireland on 071 967 1928 or our website [click here](#).

