Johne’s Disease
Control in the Dairy Cow
How Common is Johne’s Disease in the UK?

- VLA survey on 120 farms in 2006 – reliably confirmed infection in 34% of herds
- Likely to be an underestimate – NML internal analysis of over 900 30-cow screens in 2011 found one or more positive result in 68.9% – Other data also suggests the disease situation has got worse
The Iceberg Concept

- For every animal that develops clinical signs
  - there will be 7 to 10 animals excreting
  - there will be a further 7 to 10 in the silent period of infection

- In heavily infected herds around 25% of animals are faecal culture positive

- No more than half or a third of infected animals will be detected by lab tests on a single occasion.
The Iceberg Concept

- Identify and Cull
  - Infect MANY animals

- Identify to avoid transmission
  - Infect FEW animals

- Diarrhoea
- Super shedders (Milk + Faeces)
- Production loss
- ”Normal” shedders (Most in faeces + Some in milk)
- Infected (Potential future shedders)
- Non-infected

Proportion of MAP shedding
Johne’s Disease

- Caused by bacterium *Mycobacterium avium* subspecies *paratuberculosis* – long lived and persistent
- Chronic wasting condition of cattle (affects all ruminants and rabbits)
- Slow developing, typically taking 2 years to show noticeable effect.
  - Initially may see general reduction in productivity (eg in dairy 10-25% reduction in milk yield).
  - 95% of infected cows show no signs but are a constant source of new infection
- Followed by classical signs of:
  - Scouring and weight loss
  - but animal often remains bright
  - May see periods of remission
  - Increased susceptibility to other problems such as mastitis and lameness
  - Reduced fertility
  - In advanced cases, bottle jaw, emaciation and death
- Clinical cases may be rare in well managed herds as often culled prior to symptoms
Why Control?

• Annual incidence of mastitis around 65/cases/100 cows/year
• Lameness prevalence ?? 20%
• Conception rate 37% and falling,
• Cull rates ........

“We’ve got enough problems ........Why Bother?”
Is there a Cost Benefit?

Inaction in the long term will cost more than action!
Develop a farm plan with your vet

Select the most appropriate strategy for farm by assessing factors such as:

- Current **Prevalence** of Johne's on the farm
- **Biosecurity** risk associated with the farm (e.g. buying in of stock)
- **Bio-containment** risk associated with the farm (e.g. risk of spread within the holding)
- **Resources** (capital and human)
- **Aspiration** (eg desire to eliminate Johne’s completely or simply contain the disease at manageable levels)
Know Your Johne’s Disease Status

Establish a base status of the herd

1. A herd-level test to provide an indication of prevalence
2. An assessment of the risk of entry of the disease (Biosecurity)
3. An assessment of the risk of spread of the disease (Biocontainment)
Johne’s disease is complex and not always easy to detect. The more samples you take, the more reliable the results.
Question 1

What do you think is the most important source of transmission of infection of Johnes in the herd?

1. Faecal contaminated material
2. Trans-placental during pregnancy
3. Bacteria excreted directly in the milk and colostrum
4. Aerosol route
Breaking the Johne’s cycle is Key

80% of Johne’s infections occur within the first month of life
1. Biosecurity Protect and Monitor

- For herds with no evidence of disease

  1. A plan to protect the herd from disease entry
  2. Monitor through appropriate screening tests
     e.g. repeated 30 cow screens /whole herd screens quarterly

Buyer Beware (Testing)
2. Improved Farm Management

- Works by reducing the risk of spread to calves using husbandry measures alone
- Requires dedication and labour
2. Improved Farm Management

- Prevent ingestion of manure by all animals
  - Particularly the young ones
  - Keep manure out of feed

- Do this by:
  - Colostrum/milk management
  - Calf management
  - Cleaning and disinfection

- Calving pen
  - Clean and dry

- Separating cows from calves
Question 2

What form of testing have you performed within the herd in the last year?

1. None
2. Bulk Milk
3. 30 cow screen
4. Cull cow testing
5. Whole herd testing via milk /blood
3. Improved Farm Management and strategic testing

- Using a testing program in conjunction with IFM will help identify heavy shedding or infectious cows.
- Use Risk Based Planning
- For Example, test positive cattle are not allowed to enter the maternity areas.
4. Improved Farm Management, Test and cull

- Suitable for low prevalence herds wanting to quickly remove infected animals from the herd BEFORE they get chance to spread Johne’s
- Work with your vet to adopt a culling policy in addition to the steps above.
## 4. Improved Farm Management, Test and cull

### Advantages

- Hassle free testing through milk recorded sample
- Regular monitoring allowing more accurate timely culling
- Ability to manage 90% of the herd normally

### Disadvantages

- Requires milk recording or regular bleeding
- There is no gold standard test available, so false positives may be culled
- Need to mark and identify test positive cattle and calve in isolation from main herd
5. Breed to a terminal sire

• In herds where the level of infection means there is a high risk of transmission to youngstock
• Infection levels high in home bred replacements, so not advised
• Purchase replacements from lower risk herds
• Breed all cows to terminal sire until infection controlled
6. Firebreak vaccination

- A short term option for high risk or high prevalence herds to buy some time
- Delays the onset of clinical signs but does not eliminate excretion of MAP
- Vaccinated animals will test positive
  - May make selling animals more difficult
  - Makes interpretation of tests difficult
- Cross reacts with bTB test and increases possibility of false positive bTB reactors
- Vaccinated stock should be viewed as infected rather than free of disease
Control

• Has to be a team approach.
• All staff need to know polices and understand importance
• Educate
• Revisit – don’t assume it’s all working fine
A Case Study
Paraban Champion Farm
Chalk Lodge

A Responsible Approach to Johne’s Control
Johne’s disease history - before 2014

- Restocked 2001 post FMD
- 3 main herds bought
- Started seeing clinical cases 2004
- Incidence increased to 1 per month
- Commercial herd increasing size to 680+ (2015)
- 2008 - Opportunity to bleed whole herd as part of an SAC BVD study
- Joined PCHS 2010
Cows Bled Annually since 2008 and Identified
New Calf Shed and Pasteuriser – 2009
New calving pens built - 2011
Whole herd blood test results

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No Homebred +ve | 23 | 24 | 20 | 28 | 35
Average Age +ve | 4yrs 7mo | 4yrs 11mo | 5yrs 7mo | 4yrs 7mo | 4yrs 6mo

Chalk Lodge

% of animals sampled

What Happened?

Reducing nicely
There was a cluster of animals infected

20 Animals
Key Messages from a Farmer

• It is a challenging & frustrating disease because
  – The immune response and tests are not perfect
  – Events 3+ years ago affect outcomes
  – It is an iceberg disease – only see the tip
  – It is hard to keep motivating staff

• Attention to detail needed but some quick wins

• Eradication in expanding commercial herd unlikely

• Farmers must know and monitor their status

• Everyone in the industry has to be responsible
DAIRY

Johne's disease often remains hidden for years, but outbreaks have devastating effects on individual animals or entire populations. Neil Ryder speaks with vet David Black and farmer Mike Bowe who believe the disease can only be brought under control by an industry-wide approach.

Agricultural sector needs to work together to tackle Johne's disease

David Black (left), surgeon from Paragon Veterinary Group and Mike Bowe, Chalk Lodge farmer.

For far too long, many in the industry have effectively turned a blind eye to the problem of Johne's disease in cattle, fearing recognition of the threat will prejudice stock sales.

But veterinary surgeon David Black of Paragon Veterinary Group in Dalston, Carlisle, and dairy farmer Mike Bowe of Chalk Lodge, Dalston, say it is time for vets, farmers, auctioneers, dealers and breed societies to make a concerted effort to understand more about the prevalence, spread and risks of this disease.

Mr Black and Mr Bowe are working closely together to control the incidence of Johne's in Mr Bowe's 600-cow dairy enterprise. They are also teaming up to highlight the wider need for Johne's control.

They say while the very nature of the disease means eradication is very challenging, an industry-wide approach can greatly reduce incidence of the disease and transmission risk between individual animals and between herds.

Mr Black says much of this is simple risk management aimed at breaking the chain of transmission by which Johne's can move between animals and especially protecting young calves from infectious materials.

Mr Bowe is the fourth generation of his family to hold the tenancy of Chalk Lodge and with his son and daughter 'mad about farming', there is every likelihood of a fifth generation.

Stock at the farm comprises 600 milkers and 500 followers (including calves), which are all Holstein and about 90 per cent pedigree.

If a young calf is infected with Johne's, it will usually show little sign

DAVID BLACK

"Up until about this time last year we averaged about 9,500 litres per cow, but because of high feed costs, this dropped back to the present 8,250 litres at 4 per cent fat and 3.3 per cent protein. We do not push the cows and this is really a relatively low input, low output system.

"Feeding is a mix of barrier fed forage out of parlour feeders and feeding to yield in the 28:56 swingover parlour."

Calving interval

Fertility is currently very good. The submission rate of 66 per cent and pregnancy rate of 24 per cent, have culminated in a falling calving interval. This is predicted to be 385 days for this year.

with all suitable heifers retained as herd replacements. Some additional heifers are bought-in.

Mr Bowe says: "We used to have the big, tall type of Holstein,

Johne's
Key Messages to Control Johne’s Disease

• Know Your Status
• Break The Link
• Agree a Strategy with your Vet
• Predict and Prevent Infection
Johne’s Disease is a chronic, debilitating and irreversible infection of cattle which is common in many herds. While as few as 1 to 3% of cows in any year will show clinical signs of scour or wasting, more of the herd will nevertheless be affected and suffer reduced output. Animals with Johne’s Disease are likely to be culled earlier, and are also likely to be affected by other conditions, including chronic mastitis, lameness, and high somatic cell counts.

Work with your vet to assess infection risk and know your herd Johne’s Disease status.

Johne’s Disease is complex and expert veterinary advice is vital to make sure you take the most ast and effective steps towards managing the infection in your herd.

Work with your vet to carry out a risk assessment as part of your herd health plan. It is important to note that while 1% to 3% of dairy herds do not have Johne’s Disease present on their farms, they may still need a robust plan in place to keep it out.

Testing will help determine your herd’s Johne’s Disease status. The more samples you take, the more accurate will be the indication of your herd’s Johne’s Disease status. A popular method of initial Johne’s Disease screening is the targeted 30-cow screen using blood or milk from cows over 3 years of age with histories of poor yield, weight loss, or high somatic cell counts. Unlike other diseases, milk testing is not sensitive enough to detect infection at the early stage of infection. If your risk of Johne’s Disease is high, it is important that you reduce them by adopting an effective control programme and manage carefully for infection within your herd.

Understanding the spread of Johne’s between animals:

1. Infected cow
2. Dung
3. Colostrum
4. Milk
5. Infection spreads from cow to cow through dung, milk, and contaminated bedding, utensils, tests, or dirty buckets of colostrum or milk.

Johne’s infection is mainly caused by calves ingesting dung through contaminated bedding, utensils, tests, or dirty buckets of colostrum or milk. Much less commonly, the disease can be acquired in the womb or later in life. 80% of Johne’s infections occur within the first month of life.

www.actionjohnesuk.org