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

• VLA, SAC, AFBN I survey on 120 farms in 2006
  – 65% of herds had 1+ positives
  – 37% of all herds surveyed knew they had the disease already

• 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 shedding the infectious agent
  – there will be more animals 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

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

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 (e.g., 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 signs may be rare in well managed herds as cows are often culled prior to symptoms being seen
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** (e.g. 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.

Know Your Johne's Disease Status

- Repeated whole herd screens
- Whole herd individual sample screens
- Targeted cow screen
- Bulk milk ELISA

Reliability
Question 1

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

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

80% of Johne’s infections occur within the first month of life.

Johne’s infection is mainly caused by calves ingesting faeces from contaminated bedding, udders, teats or on dirty buckets of colostrum or milk. Much less commonly the disease can be acquired in the womb or later in life.
National Johne’s Management Plan:

6 strategies for Johne’s Disease control
1. **Biosecurity Protect and Monitor**

- For herds who have completed appropriate screening and have no evidence of disease
  1. A plan to protect the herd from disease entry
  2. Monitor through appropriate screening tests e.g. repeated cow screens / whole herd screens

**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 faeces by all animals
  – Particularly the young ones
  – Keep faeces 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?

- None
- Bulk Milk
- 30 cow screen
- Cull cow testing
- Whole herd testing via milk /blood
3. Improved Farm Management, risk assessment and strategic testing

- Using a testing program in conjunction with IFM will help identify heavy shedding or infectious cows
- Removing high risk cows allows IFM to work better
- 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 biocontainment & IFM policy in addition to solely culling test positives
• May be high cost of control with slow progress without IFM…
Risk Based Control With Regular Testing

Advantages

• Hassle free testing through milk recorded sample / blood testing
• 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 / negatives 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 but barriers to adopting other strategies
- If infection levels high in home bred replacements, do purchased animals represent a lower risk?
  - 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; what is next step?
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
Herd Performance

KPIs at a glance for last milk recording 24/03/2015

<table>
<thead>
<tr>
<th>KPIs</th>
<th>'Worst'</th>
<th>'Best'</th>
<th>You</th>
<th>'Worst'</th>
<th>'Best'</th>
<th>Mean</th>
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<td>Ave. Fat %</td>
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<td>Mean Parity</td>
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Source: Bishopton: All Recorded Herds

Print Graph
High Milk Production

Milk per cow per year

Period from: 23/04/2010 to 23/04/2015

“A constant 33 litre/cow daily average is now an achievable and realisable aspiration.”

John Smith, Crosby Grange
Herd Performance
Culling at 34%
1. Eliminate the source of Infection

Herd Monitoring

<table>
<thead>
<tr>
<th>Line No.</th>
<th>Ear Tag</th>
<th>ELISA 24/03/2015</th>
<th>ELISA 22/06/2015</th>
<th>Days in Milk*</th>
<th>Milk Yield (kg)*</th>
<th>Parity</th>
<th>Milk Yield Drop</th>
<th>Predicted Calving Date</th>
<th>Infection Group on 22/06/2015</th>
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</table>

*RED* cows (High-risk cows) potentially culled prior to next calving (start with cows with high values). NO COLOSTRUM/MILK USED FOR CALVES

*YELLOW* cows (High-risk cows) require good hygiene around calving. Cull only if few high-risk cows. NO COLOSTRUM/MILK USED FOR CALVES

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HerdWise
Manage disease. Protect your future.

Johne's Action
Johne's Laboratory Limited
## Management Decisions

### Calving time

<table>
<thead>
<tr>
<th>Line No.</th>
<th>Ear Tag</th>
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*RED* cows (High-risk cows) potentially culled prior to next calving (start with cows with high values).

**NO COLOSTRUM/MILK USED FOR CALVES**

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**NO COLOSTRUM/MILK USED FOR CALVES**
Good Fertility
Homebred Replacements
2. Prevent New Infections

Protecting Calves

Separate calving/maternity area for low vs high risk cows

Hygienic colostrum management
Case Study 2
Chalk Lodge
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
- Paraban Champion Farm
Cows Bled Annually since 2008 and Identified
New Calf Shed and Pasteuriser – 2009
New calving pens built - 2011
Whole herd blood test results

<table>
<thead>
<tr>
<th>Date</th>
<th>% Positive</th>
<th>% Non conclusive</th>
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<tr>
<td>Feb 10</td>
<td>9.4</td>
<td>0.7</td>
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<td>Mar 11</td>
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<td>Mar 14</td>
<td>6.7</td>
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<th>2011</th>
<th>2012</th>
<th>2013</th>
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<td>Average Age +ve</td>
<td>4yrs 7mo</td>
<td>4yrs 11mo</td>
<td>5yrs 7mo</td>
<td>4yrs 7mo</td>
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A cluster of animals infected previously can emerge on testing.
Key Messages from a Farmer

• It is a challenging disease so be realistic regarding rate of progress:
  – 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 monitor & manage their status & risks

• Everyone in the industry has to be responsible
Key Messages to Control Johne’s Disease

• 1. Know Your Status - Eliminate the source of infection
• 2. Break The Link - Prevent new calf infections
• 3. Agree a Herd Specific Risk Management Strategy with your Vet

See Ontario Johne’s Whiteboard: