



INTRODUCTION:

Participants attending the meeting:

The videoconference meeting of the WeCAHN dairy network was held Feb. 9, 2023.

Participants attending the meeting: dairy practitioners, laboratory diagnosticians, veterinary college faculty, and industry representatives.

Report Contents:

1. Dataset Overview
2. Interesting or Unusual cases
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1. Dataset Overview:

i. Interesting cases

ii. Clinical impressions survey

iii. Laboratory data: UCVN Diagnostic Services Unit (DSU); Prairie Diagnostic Services (PDS); Manitoba Veterinary Diagnostic Services Laboratory

Clinical Impressions Survey and Laboratory Data:

The clinical impressions survey is a simple, quick overview of diagnoses by practitioners, which does not require practitioners to extract data from their information management systems to complete. Practitioners report, for a list of selected pathogens/syndromes, how frequently they have diagnosed these pathogens over the time period in question. Additionally, they are asked whether, compared to the previous time period, their diagnosis of these pathogens is increasing/decreasing or stable. For each category of disease, clinical impressions survey findings are followed by relevant laboratory data.

2. Interesting or Unusual Cases:

1. Interesting case that appeared as routine coccidia in a post weaned calves on monensin, which should prevent this.

- History: large dairy with ongoing calf health issues.
- 4-7 month old calves noted unthrifty as a group when handled to change barns.
- About 10/70 were 50 - 60 pd light; had bad diarrhea.
- 15-20% of calves were positive for coccidia although on monensin.
- When followed up with *Salmonella* titres (herd was included in provincial pilot project studying titres in high risk farms) 5 of 6 sampled were positive.

Manitoba Provincial pilot program:

"At risk" herds are identified by having:

- Poor biosecurity e.g. lots of cattle movements or introductions.
- Chronic unexplained disease problems (thinking *Salmonella* could cause immuno-suppression and thus predispose to other problems, as with the herd with coccidiosis while on monensin).
- Recent herd expansions

Interesting or Unusual Cases continued:

Q: Can we salvage these animals? Could they eventually be appropriate for slaughter?

A1: Be careful in distinguishing between slaughter on-site and slaughter in commercial facility which likely has better hygiene and much less potential for contamination of the carcass during slaughter process.

A2: Also be clear that farm-based slaughter is for the owner's OWN consumption only. And if the animal doesn't look good, it shouldn't go to slaughter anywhere.

CONSENSUS:

- **Livestock industries, especially swine and poultry, are moving to reduce if not eliminate *Salmonella* from the production chain. In this context, sending an animal potentially still infected and/or shedding is not advisable.**
- **There is no regulatory control prohibiting sending a "recovered" animal for slaughter, but the provinces would advise against it. Long-term this needs to be discussed as an industry goal.**

2. *Bibersteinia trehalosi* cases in prewean Holstein calves on one farm.

- History: This is the first isolation of *B. trehalosi* in our practice.
- Calves were housed in hutches but with lots of nose-to-nose contact.
- Management questionable:
 - ◇ Cows were not vaccinated for respiratory pathogens.
 - ◇ Calves received one S-Q *Mannheimia haemolytica* vaccine
- Clinical signs: some pneumonia, most cases presented as sudden deaths.
- Saw ~ 4 deaths in a 5-6 week period in a group of ~ 30 calves.
- Post-mortem'd one: chronic pneumonia.
- Animal Health Centre: isolated *B. trehalosi*.
- Control: we've added an intra-nasal vaccine including *M. haemolytica* and *Pasteurella multocida* within the first week of life, followed by injectable booster at 6 wk.

Q: Is this a frequent isolation at AHC?

A: More intermittent. Often seen with multiple infections.

Q: How about clinically by other practitioners?

A: Usually more of a one-off.

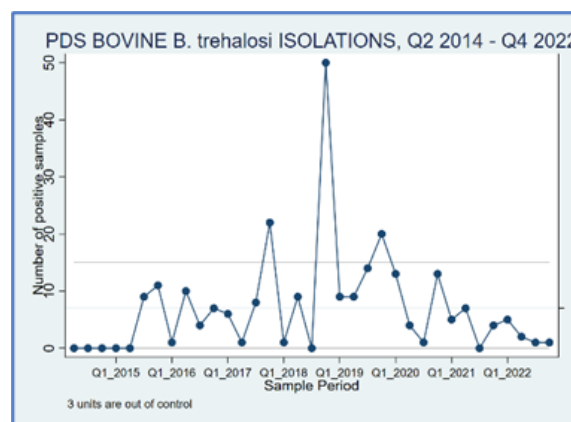
3. Respiratory System

- Respiratory disease was reported Very frequently by network practitioners, with un-differentiated pneumonia (i.e. clinical diagnosis without supporting necropsy or lab data) the most frequent syndrome.
- Bronchopneumonia was the most frequently reported pathologic syndrome.

Recap on 'control charts': For each of the following graphs, each data point reflects the number of positive samples or cases reported, over a 3 month period. The upper and lower horizontal lines, called control limits, are similar to statistical confidence intervals.

Control charts are a simple way of presenting data collected over time. Apparent trends (e.g. increasing or decreasing frequencies of detection) over time, or individual points lying outside the control limits, suggest a need for investigation to determine whether/how significant a signal they represent.

- *Bibersteinia trehalosi* isolations at PDS peaked around 2019 and have been declining since.



- Like the other respiratory pathogens, *B. trehalosi* tends to be most frequently isolated in Q4 (October – December).

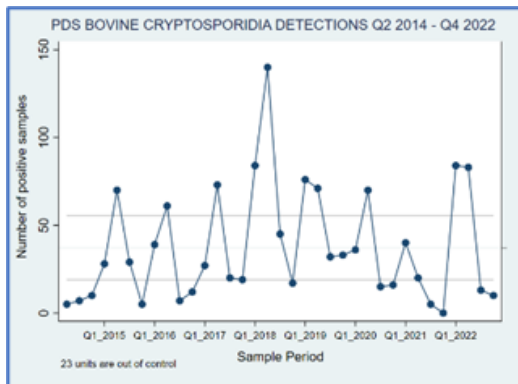
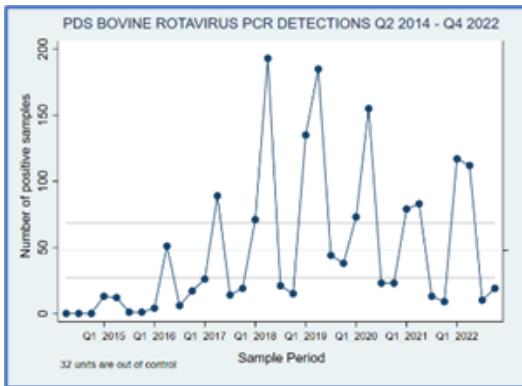
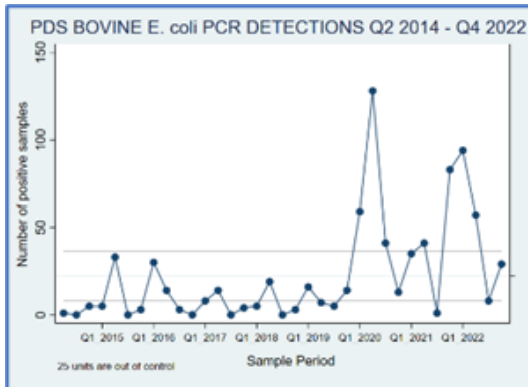


4. Digestive System

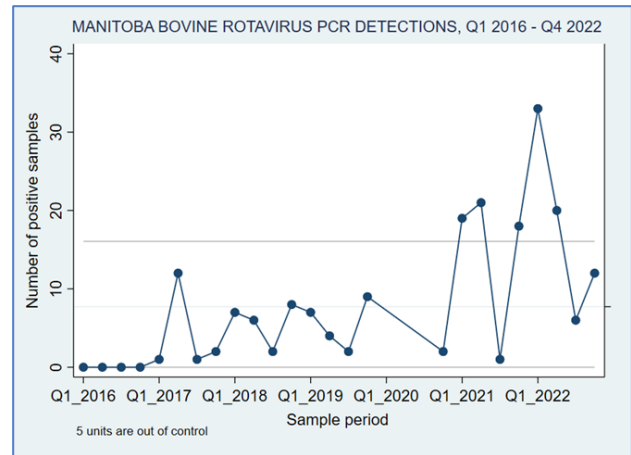
- Diarrhea was the most frequently reported digestive syndrome reported by network practitioners.

Considering calf scours pathogens:

- Frequency of diagnosis of common calf scours pathogens (*E. coli*, Rotavirus, Bovine coronavirus, Cryptosporidia) were all described as Increasing in Q4 2022 by one network practitioner.
- Laboratory submissions show a similar broad trend for Cryptosporidia and Rotavirus at PDS, peaking ~ 2019-2020 and declining since that time. In contrast, potentially disease-causing *E. coli* PCR detections at PDS have been increasing for several years.



- In Manitoba bovine Rotavirus detections have been trending upward. Interestingly, this is driven by an increase in proportions of samples categorized as positive, with total quarterly sample submissions for RV assay declining over the past six years (data not shown).



- There appears to be a cyclical pattern for detection of some of these scours pathogens. Causes are currently unclear. They could include factors such as new strains of pathogens, or changes in risk factors (e.g. nutritional stress).
- **Bloody diarrhea:** was diagnosed Rarely to Commonly by network practitioners, associated with coccidia, *Salmonella* Dublin, and winter dysentery.
- *Salmonella* Dublin cases were reported by UCVM (in a four-week-old Holstein heifer with septicemia) and Manitoba VSDL.

Update: Province of Alberta:

- Had one farm experience *Salmonella* Dublin in calves with mortalities; in follow-up with producer the mortalities have stopped and they appear to have no more problems.
- This farm has had *Salmonella* Typhimurium in the past.

5. Reproductive System

- As usual the most frequently reported reproductive presentations were individual ovarian or uterine disease, both reported Commonly to Very frequently.
- Abortions or infectious infertility were reported diagnosed never to rarely by practitioners, associated with BVD, IBR, and *Neospora*.
- Detections of potential reproductive pathogens including IBR, BVD, and *Ureaplasma* at Manitoba VSDL and PDS continued to be stable (data not shown).
- Non-infectious infertility was reported diagnosed Commonly and associated with energy deficiency and protein deficiencies by one network practitioner.

6. Mastitis

- Acute mastitis associated with both Gram negatives (*E. coli* and *Klebsiella*) and Gram positives (*Staph. aureus*, *Streptococcus dysgalactiae* and *Streptococcus uberis*) was reported Rarely to Commonly by practitioners.
- Isolations of *Strep. dysgalactiae* and *Strep. uberis* continued stable at both PDS and Manitoba VSDL.

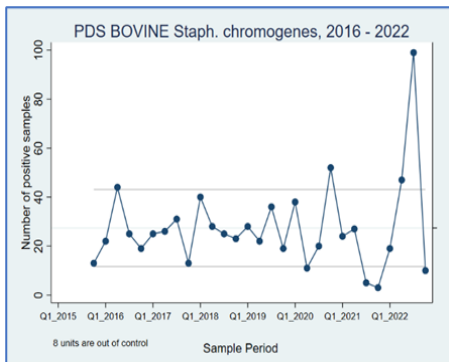
Non-aureus *Staphylococcus* (NAS):

- A recent presentation of some research done at Université de Montréal studied the potential importance of some “non-aureus” *Staphylococci* in clinical mastitis, concluding that four (*Staph. chromogenes*, *Staph. epidermidis*, *Staph. simulans*, and *Staph. xylosus*) could have pathogenic potential (<https://www.youtube.com/watch?v=dM969GiqzCM>).
- This was especially interesting given the relative frequency of their isolation from milk samples in western Canada.

Comments:

- Using MALDI-TOF diagnostics we are aware of ~ 24 species of staphylococci, with *Staph. aureus* being most familiar.
- Aside from *Staph. aureus*, 7 others are found fairly commonly in milk, especially *Staph. chromogenes*, and most heifers’ teats are colonized by year of age with this organism.
- Four are potentially capable of causing as much inflammation as *Staph. aureus*: *Staph. xylosus*, *Staph. simulans*, *Staph. epidermidis*, *Staph. chromogenes*.
- These all are isolated relatively frequently in clinical bovine milk samples at PDS and Manitoba VSDL.
- Following is a look at frequency of diagnosis over time at PDS. The most frequently isolated of the four is *Staph. chromogenes*.
- The plot of isolations on the left, below, can be “decomposed” into several components: the broad underlying trend, the seasonal trend, and the remaining variation in the data.
- The following decomposed graphic on the right, below, shows decomposition of the observed *Staph. chromogenes* isolations (top plot/line) into a global or overall trend (second plot/line), seasonal trend (third plot/line) and residual values (fourth plot).

a) Bovine *Staph. chromogenes* Isolations at PDS, 2014—2022



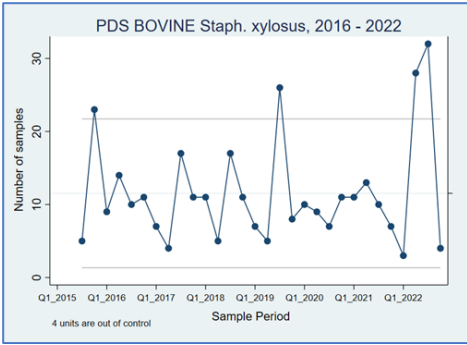
b) Decomposition of Bovine *Staph. Chromogenes*, PDS, Q2 2014 – Q4 2022



(Mastitis, continued)

- Like *Staph. chromogenes*, *Staph. xylosus* isolations experienced an uptick last fall in milk samples at PDS.

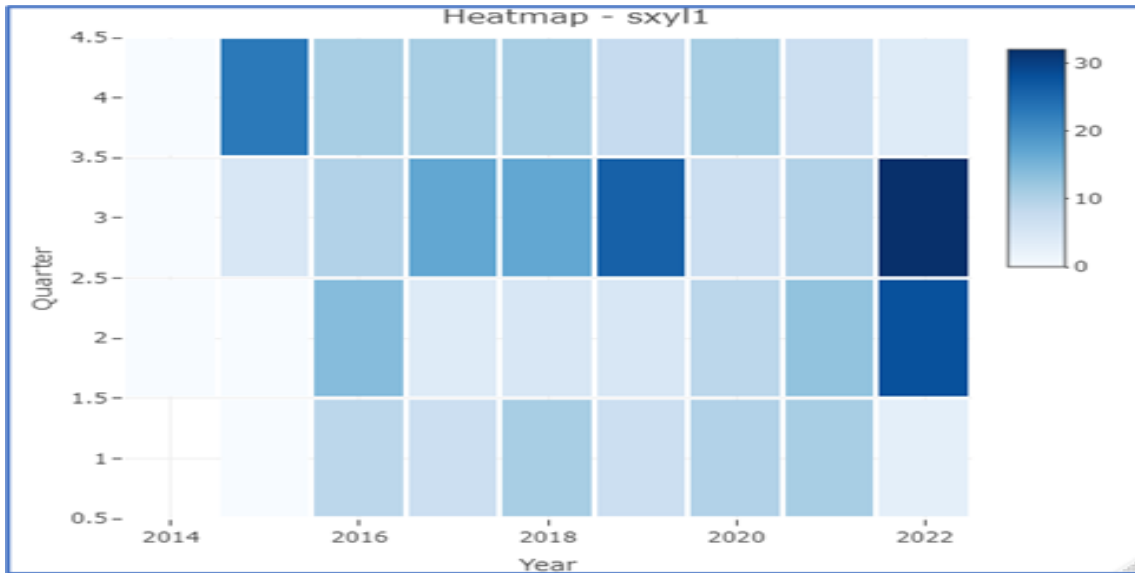
a) Bovine *Staph. xylosus* , PDS, 2014—2022



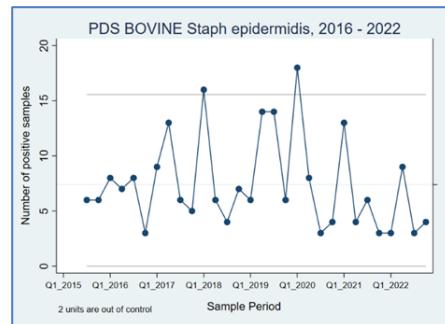
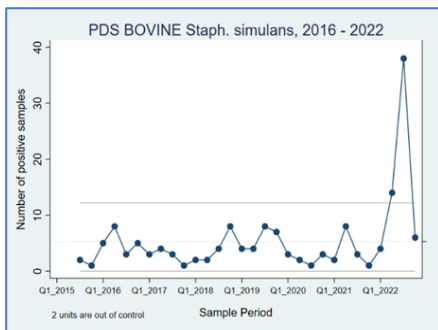
b) Decomposition of Bovine *Staph. xylosus*, PDS, Q2 2014 – Q4 2022



c) Heatmap of Bovine Isolation of *Staph. xylosus*, PDS, Q2 2014 – Q4 2022:



- The heatmap above shows the number of isolations of the bacteria, organized by quarter (meaning 3 month period). Quarter 1 = Jan.—March, and Q 4 = October—December.
- The darker the colour of a specific quarter’s square in the heatmap, the more frequently the bacteria were isolated.
- Interestingly both of these staphylococci seem to be isolated most frequently in Q3 i.e. pasture season, July—September.
- *Staph. simulans* isolations also showed a peak in Q3 2022, in contrast with *Staph. epidermidis* (below).



(Mastitis, continued)

Q: How do veterinarians respond to Non Aureus Staph (NAS) on a culture report?

A1: Like Gram-negatives (e.g. *E. coli* and *Klebsiella*), we generally don't treat them.

A2: Depends on clinical condition of cow. If she has udder involvement, then we treat; if not, we don't.

A3: Ditto. Generally, we treat the Streps, and maybe *Staph. aureus* in a heifer or depending on clinical appearance of the cow. We don't just treat for flakes in the milk anymore since in our practice we find antimicrobials to treat a clinical presentation having just flakes in milk (as opposed to clinical udder involvement) are only effective in ~ 15-20% of cases.

WeCAHN Podcast: Foreign Animal Disease Planning and Prevention for Cattle

Dr. Karin Orsel, a professor in epidemiology and infectious diseases from the University of Calgary, has some up close and personal experience with the impacts of bovine infectious diseases of cattle that currently don't exist in Canada. These foreign animal diseases, such as foot and mouth disease, are kept out of Canada only by the strength of our farm biosecurity and through the ongoing monitoring and reporting of any of signs of concern to veterinarians for further investigation.

Her experiences highlight the potential risks of international travel, and the importance of vigilance and traceability in the cattle sector to ensure the health of our cattle and the security of our food systems.

<https://wecahn.podbean.com/e/foreign-animal-disease-planning-and-prevention-for-cattle/>

7. Meeting take-aways

- 1. Need Industry guidance on decisions for treatment of *Salmonella* cases and ultimately moving to slaughter.**
- 2. Species of *Staphylococci* other than *Staph. aureus* may be encountered in western mastitis milk samples.** Opinion varied somewhat across network practitioners regarding approach to treatment; check with your herd veterinarian.

