Western Canadian Animal Health Network

WECAHN BEEF NETWORK PRODUCER REPORT

APRIL-JUNE 2023

Beef Network Meeting

The WeCAHN beef network met Aug. 31 2023 with veterinary practitioners, producers, provincial veterinarians, diagnosticians, and researchers in attendance.

Report Contents:

1. Interesting Cases

i. Redwater in beef and dairy herds secondary to liver fluke migration

- A practice in southeastern Manitoba has seen a series of herds with clinical redwater after fluke migration. The first was a dairy herd, which was followed by several beef herds.
- **Diagnosis in this herd**: Two cows died suddenly but were not post-mortem'd. Then a bull died and post-mortem was done by network practitioner, with major finding of large areas of liver damage. Subsequently another cow which died and was post-mortem'd had similar lesions.
- Practitioners' clinical impression is that they are only seeing smaller flukes but realize that a previous survey only identified immature forms of larger fluke [so they could appear to be the smaller species] i.e. *F. magna*.
- **Detection at slaughter**: the Manitoba Food Safety and Inspection veterinarian reported that flukes are the third most common reason for liver condemnations in the province. Inspectors report usually seeing scar tissue as opposed to the flukes themselves. [findings are different in small ruminants in which there is much more extensive tissue damage in multiple organs].
- US packers have reported to Canadian feedlot veterinarians that Canadian cattle slaughtered in the US have significant levels of flukes observed at slaughter, including cattle originating from parts of western Canada other than Manitoba. That said, animals seen in western feedlots with flukes tend to originate from Manitoba.

QUESTION: any federal slaughter data on liver flukes in liver condemnations from cows slaughtered in Canada by region?
ANSWER: what is publicly available at CFIA website only has codes for "hepatitis" and "jaundice" so short answer is no.

ii. *Coxiella burnetii* (Q fever) abortion.

QUESTION: this 9 months' gestation fetus had partially aerated lungs. Is this unusually late in pregnancy for a *C. burnetii* abortion?

COMMENT FROM PATHOLOGIST: late gestation abortions are not an unusual presentation to the lab, since the organism causes a chronic infection in the foetus. All ruminant abortions in the lab are categorized as risk group 3, which requires additional Personal Protective Equipment for staff. One finding from the Saskatchewan-supported program automatically testing ruminant abortions with placenta available for *C. burnetii* at no charge, has been the observation that it may be detected in some (sub?)clinical cases beyond those in which it is concluded to be the cause of abortion. The detection rate in 2022 was about 12% from all placentas tested.

Interesting Cases (continued)

[These are good arguments for producers to consistently wear appropriate PPE when intervening in calvings. This organism can cause severe and debilitating disease in people].

iii. *Streptococcs plurianimalium*-associated abortion.

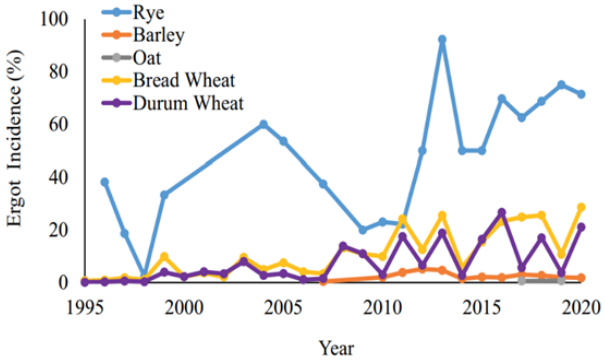
- A 33 kg, male, Angus, bovine fetus (dead born), and placenta were examined on April 24, 2023.
- **COMMENTS**: "There is 2+ isolation of the *Strep. pluranimalium* from placenta. This organism has been identified previously in the cases of abortion in cattle at DSU. It is known to cause meningitis in calves, abscesses in animals, and abortion in a wide range of animals. Pathologist suspects it is a cause in this case. In previous cases, have seen inflammation of the placenta and pneumonia. In this case, there is subtle inflammation in the placenta. Q-fever PCR test is negative in this case."
- While the organism was not definitively associated with the cause of the abortion, it was hypothesized by the pathologist.
- This is another potentially zoonotic agent which has been associated with disease in people.

iv. Herd problem with skinny cows dying, and some findings suggestive of ergot toxicity

- **History**: Owner tested their pellets and found ergot. Stopped feeding the pellets a month ago. Still wondering if they can test for it [on rumen content in clinically affected cattle].
- Lab findings from cow post-mortem: Received fresh tissues for examination including 2 ear tips, mammary gland, the tail tip, two claws from the left hindlimb and rumen content. The ear tips were dry and firm and on section the subcutaneous tissue was red. Similar changes were noted on the tail tip. The feet were unremarkable.
- 1. Ear tips, dry gangrene.
- 2. Tail tip, healing wound.
- Ergot testing on rumen content: not detected.

BACKGROUND: Ergot detection in Canadian crops over time

From: Walkowiak et al., 2022



Comparison of frequency of detection of ergot in Canadian cereal grains, 1995-2009 vs 2010 – 2020

Ergot in Canadian cereals 797

Table 1. Comparison of annual ergot incidence (% of samples inspected in a year that contained ergot sclerotia) and median severity (% mass sclerotia/mass sample inspected) between the two time periods of 1995–2009 and 2010–2020 for Canadian cereal samples submitted to the Canadian Grain Commission Harvest Sample Program (2022a).

Crop	Total N samples	1995–2009			2010–2020		
		N samples	Ergot incidence (%)	Median ergot severity (%)	N samples	Ergot incidence (%)	Median ergot severity (%)
Bread wheat	177,831	117,557	4.2	0.02	60,274	19.5	0.02
Durum wheat	46,489	32,166	2.9	0.02	14,323	13.1	0.02
Barley	4,470	394	0.3	-	4,076	2.4	0.02
Rye	803	547	27.6	0.08	256	65.6	0.08
Oat	421	-	-	-	421	0.7	0.01

From: Walkowiak et al., 2022

Interesting Cases (continued)

Who tests what, when?

- **Saskatchewan Agriculture: "**Seed cleaning plants and grain terminals would look for it in the grain, but not at the field level. The amount of ergot contributes to the grade the grain is given – too much, and it's downgraded to feed. As long as the elevator has enough wheat (or rye) free of ergot that's a No.1 grade they can blend in that ergot to lower its levels to the correct guidelines. "
- **Cattle producer: "**We bring in a boatload of screenings. Testing is up to us. We purchased from a neighbour who has a seed cleaning plant. We aren't usually worried about the stuff he grows as it is on sandy poor soils where we don't typically see ergot. However one particular load was from wheat grown at another location and we ran into problems… Screenings are not typically tested (we test them coming in normally) but a vendor selling screening pellets or further processed products would typically do some testing on the product prior to sale. For the most part – it is up to the buyer to test."

DISCUSSION:

i. Is ergot broken down or inactivated during ensiling process?

Feedlot nutritionist: "The short answer is I'm not sure. Due to the cost of testing I don't know of anyone that is doing routine testing and generally we are only testing when we think there is a problem. We did recently test some silage for Ergots and it was clean along with all of the other mycotoxins. As for grain the primary monitoring would be looking at incoming grain for contaminated kernels. I hear of the occasional load being rejected but can't say it is any different from the past. But we may be missing contaminated grain. There are a few folks trying some rye silage and it works out ok. Those that are trying it are using it in a rotation so if that is handled correctly the risk of Ergot should be lower. [there is a good page with recs for minimizing risk of carryover at Saskatchewan Agriculture: https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/agribusiness-farmers-and-ranchers/crops-and-irrigation/disease/ergot-of-cereals-and-grasses] So far, I haven't seen any issues with the rye silage and ergots. Due to the lifecycle of Claviceps I wouldn't think it would be possible for it to replicate in silage and the low pH would also likely inhibit any reproduction."

ii. Can sclerotia be present in straw harvested from a contaminated field?

ACTION: unclear; will try to find out.

COMMENTS:

i. An MSc student just defended her thesis, describing study of the impacts of relatively lower levels of ergot alkaloids on feedlot animals. ["Effect of Increasing Concentration of Ergot Alkaloids in the Diet of Feedlot Cattle: Performance, Welfare, and Health Parameters" in August issue of Journal of Animal Science]. The animals exposed to ergot in this research did not show typical signs (e.g. sloughing hooves) but more subtle problems of reduced performance, and reduced heat tolerance.

ii. COMMENT: We see a big increase in uptake of hybrid rye varieties especially in irrigation areas, and commercial feedlots will likely be using a nutritionist and receiving advice on how to mitigate the risk of ergot. However, smaller producers are more likely to be using older varieties more susceptible to ergot, and also to be in general less aware of the potential risks. It could be good to put together a list of resources, or draft a factsheet, targeting that group, with basic information on what to send where, or who to ask for guidance.

Interesting Cases (continued)

RESOURCES:

- Podcast https://podcasts.apple.com/ca/podcast/the-beef-cattle-health-and-nutrition-podcast/id1652384748?i=1000614512200
- BCRC blog https://www.beefresearch.ca/blog/ergot-in-beef-cattle-feed/

TAKEAWAYS:

- The frequency of ergot contamination of tested cereal grains in western Canada is increasing over time.
- Rye is high! and the probability of grain being contaminated varies with species: rye > wheat > barley > oats.
- Rye and triticale are becoming increasingly popular western crops given their relative drought resistance.
- Screenings are anecdotally reported to be more likely to have elevated levels of ergot relative to other feedstuffs. If the vendor has not tested screenings for ergot, the purchaser should.
- Newer hybrid rye varieties have reduced risk of ergot contamination relative to older ones.

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v. Calf with hemorrhages in stomach and intestines.

- **History**: day old Angus calf, grossly dehydrated and partially skinned, submitted to DSU.
- **Gross examination** revealed severe pathology in the gastrointestinal tract which explains the sudden death of this calf. The primary concern is for a clostridial infection and death due to the blood poisoning.
- PCR positive for *C. perfringens* A and attaching and effacing *E. coli*.

QUESTION: How commonly would a calf which died due to illness be skinned to improve chance of its dam adopting a new calf, which would have the skin tied on to its back for few days?

Consensus: very commonly . . . although it is really bad from a biosecurity perspective.

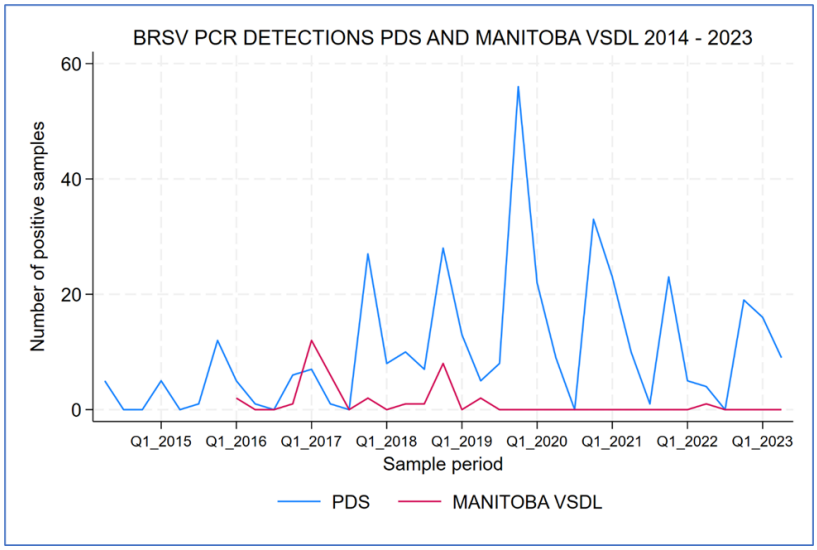
2. Syndromic Surveillance

a) Respiratory Disease

Bovine Respiratory Syncytial Virus

While BRSV PCR detections have trended sharply up at PDS from 2017 – 2020, this has not been the case at Manitoba VSDL.

In fact, in Q1 of 2017 the number of BRSV detections was greater at Manitoba than PDS, but the trends moved in opposite directions thereafter. The trend to increasing BRSV detections appears to have been driven by a similar trend in submissions for BRSV assay, and the proportion of samples categorized as positive has not changed significantly.



Syndromic Surveillance (continued)

Unfortunately, a large proportion of submission forms do not contain additional information. Such as class or age of cattle sampled However, considering the samples for which this information was provided in the submission form, these BRSV submissions originate predominately from pre-weaning beef calves.

Project is being developed: Clinical BRSV isolates could be collected prospectively and genetically sequenced with the objectives of:

- Identifying subtype(s) currently circulating in the west.
- Compare these with older strains from other sources.
- Compare these with current vaccines strains.

This information could potentially be used to build capacity for distinguishing between vaccine and wild strains in clinical samples, which has been previously discussed at network meetings.

b) Digestive Disease

Digestive disease associated with diarrhea was reported commonly by network practitioners, and associated with several common pathogens. Calf diarrhea associated with *E. coli*, rotavirus, coronavirus and cryptosporida were all rated Increasing and also associated with treatment failure by one practitioner. However, detections of these pathogens were stable at both laboratories.

***Mycobacterium avium paratuberculosis* (MAP)**

While practitioners have reported that their diagnoses were stable in Q2 (April—June) and previously, the trend is to increasing counts of MAP PCR diagnosis at both PDS (this is in clinical samples collected outside of the SK provincial control program) and Manitoba.

PDS MAP PCR sampling overview

- Currently practitioners' sampling strategy appears to be risk-based; important to note that the data reported by WeCAHN is outside that generated by the provincial Johne's program though.
- Given recent research (Johnson et al., 2022), important to note that this risk-based testing may provide useful information to inform culling decisions but is unlikely to eliminate MAP from an infected herd.

Given some cows are likely to be culled in the near future given time of year and also drought situation in some areas, Johne's status could be one piece of information to inform culling [or purchase?] decisions.

Saskatchewan Johne's control program experience:

- **Overview:** participants receive free testing for up to 250 head in the first year of the program, with the level of support reduced to 50% thereafter. This was originally restricted to serology but now may be used for PCR (initially pooled in lots of 5 samples, with re-test of each sample in a pool testing positive; same general approach to pooling as Animal Health Centre Abbottsford).
- **Who participates:** more popular with commercial producers than purebred folks. The initial questionnaire captures reasons for enrolling, and most participants either suspect or know that their herd is positive.
- For more information: https://skstockgrowers.com/johnes-disease-surveillance-program/

3. Scan

i. Bovine tuberculosis in Saskatchewan June 2023

On February 23, 2023, the United States Department of Agriculture (USDA) notified the CFIA that tissues collected at slaughter from a heifer originating from Canada had a positive polymerase chain reaction (PCR) test for bovine tuberculosis. The animal was exported from Saskatchewan in September 2022 and was in a US feedlot until its slaughter.

In May 2023, all animals over six months of age in the herd of origin were tested for bovine TB and the reactor animals were removed for slaughter and post-mortem examination for signs of the disease. Tissues from the suspect animals were shipped to the CFIA's Ottawa Laboratory–Fallowfield where PCR testing confirmed 2 cases of bovine TB on June 19.

ii. July update

The index herd has been slaughtered and tested. A herd has been quarantined in MB due to fenceline contact during summer grazing over the last 5 years or so. Four animals from the index herd were found alive in a feedlot in AB. The pen has been quarantined and those 4 will be slaughtered and tested (if positive, rest of pen will be tested but as all are to slaughter there is no concern about additional herds or premises implicated because of these 4 animals)

For more information: https://inspection.canada.ca/animal-health/terrestrial-animals/diseases/reportable/bovine-tuberculosis/saskatchewan-2023/

4. Meeting Takeaways

- Ergot risk mitigation: if purchasing or raising rye for feed, consider newer hybrid varieties to reduce risk of ergot contamination; if feeding rye or screenings, especially rye or wheat, test; if purchasing other grains, at least visually inspect, remembering the limitations of this method of assessment.
- Calving or abortion protocols: PPE should be worn to reduce risk of zoonotic disease. Pathogens such as *Coxiella burnetii* (Q fever) may be with abortions.
- If you're culling cows, the ones with Johne's are a great place to start. They're going to get worse, and they're costing you money.