



The WeCAHN beef network met June 14th 2024 with veterinary practitioners, producers, provincial veterinarians, diagnosticians, and researchers in attendance.

Report Contents:

1. Overview of Dataset
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Data sources in this report include:

- i. Clinical Impressions Surveys completed by network practitioners.
- ii. Data shared by western veterinary diagnostic laboratories: Manitoba Veterinary Services Diagnostic Laboratory (VSDL), Prairie Diagnostic Services (PDS), and University of Calgary College of Veterinary Medicine Diagnostic Services Unit (UCVM DSU).
- iii. Scan: Bovine surveillance reported by other sources or networks.

Feedlot Animal Health Surveillance Update:

- i. Background :A working group has been seeking funding to establish a feedlot health surveillance system, which is a current beef surveillance gap previously identified by the Canadian Animal Health Surveillance System (CAHSS). This group was recently successful in procuring funding for a 4 year Alberta pilot project supported by Alberta SCAP funding.

ii. One of the first activities of this group will be to conduct a focus group meeting 17th July in Lethbridge. Currently, confirmed participants include government veterinarians, industry, producers, and practitioners. A major objective for this meeting is to identify which data are most important to collect.

Case report (HYPOTHETICAL): milk cow with reduced production

History: Cull dairy cow used as farm's milk cow.

Clinical signs:

- Drop in milk production.
- Off feed.
- Fever.
- Thickened colostrum-like milk.

-> This could be a potential HPAI (H5N1 Avian Influenza) case.

Update: To date (9th July 2024) confirmed HPAI idairy herd detections in 12 states (including Minnesota, South Dakota, Wyoming, and Idaho) and 140 dairy herds.

- Detections of infected dairy herds in 3 new states in early June, AFTER federal movement restrictions imposed.
- Transmission routes remain unclear, although understanding is that one spillover event in late 2023 from birds to cattle was followed by within-herd and between-herd transmission..
- Recently H5N1(the type of HPAI Avian Influenza infecting US dairy cattle and poultry) has been detected in mice on premises with H5N1 positive poultry.
- Reports of respiratory disease in clinically affected dairy cattle, with severe disease in dry/freshening cows. (Oguzie et al., 2024) https://wwwnc.cdc.gov/eid/article/30/7/24-0717_article

The current understanding of transmission is that there was likely a single spillover event from birds to dairy cattle, not a bunch of separate ones explaining the outbreaks in each herd or even each state.

Another takeaway from genomics is that given the level of variation in cattle isolates collected so far, likely this initial spillover event happened months before the first identified clinical cases, so again the virus then circulated un-detected for several months.

In a nutshell we are learning that similar to pigs, dairy cattle may be a potential mixing vessel for influenza viruses originating from multiple host species.

A RECENT SMALL STUDY IN Denmark identified avian influenza receptors in beef respiratory tract and brain, as well as dairy cow brain, respiratory tract and udder. The significance of this finding is currently unclear, given no reported beef cases and voluntary testing in the U.S. and Canada restricted to dairy cattle. Reference: Kristensen et al., 2024. <https://www.biorxiv.org/content/10.1101/2024.05.03.592326v1.full.pdf>

QUESTION: are producers concerned by the HPAI outbreak in US dairy cattle? And if so, do they think it could have an impact on their own operations?

ANSWER FROM VETERINARIANS:

- For feedlot clients: the cattle market dropped immediately in response to news of the initial US detections. I still spend time updating clients on H5N1 developments; they are fearful. Our feedlot producers were also worried if HPA1 would impact CFIA import protocols for US feeders.
- It's unfortunate that in the ongoing meat testing for HPAI, the news reports just say virus was detected, since the only thing detected are H5N1 fragments detected on PCR, and so far no infectious virus has

been isolated.

- In our practice concerns peaked shortly after the initial infections, then declined.
- Our clients don't indicate concern.
- Neither do ours, although we are currently dealing with an outbreak of disease in a dairy herd fairly close to the US border for which we are considering H5N1 as a ruleout. There could be some potential for beef exposure in our beef clients feeding beef-on-dairy cross cattle.

COMMENT:

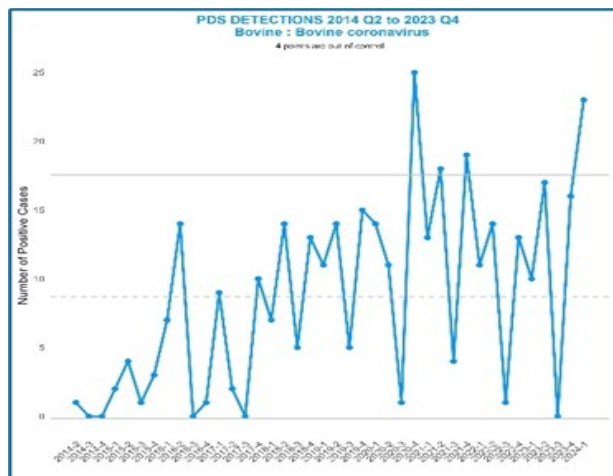
- Our group have tested thousands of beef deep naso-pharyngeal (DNP) swabs collected in 2021 and 2022, using PCR and metagenomics. We found lots of Influenza group D positives, and some C. However, we found no influenza group A positive samples (H5N1 viruses would fall in this group A).
- NOT finding Influenza A from 2021 & 2022 samples is quite valuable information.
- Especially since late 2021 & 2022 coincided with the first waves of HPAI in poultry in western Canada, with lots of wild waterfowl both dying from and moving the disease. [This observation from 2021 and 2022 samples at least confirms that H5N1 has NOT been present un-detected in western Canadian cattle since the start of the H5N1 outbreak in 2022 in poultry].
- **Takeaway:** Our understanding of the virus will continue to change as it is increasingly studied. However, producers can act to mitigate their risk by employing good biosecurity practices which they may already have in place. READ MORE: <https://www.beefresearch.ca/blog/prevent-a-biosecurity-breach/>



Syndromic surveillance

Respiratory system

An uptick in Bovine coronavirus (BCoV) associated with respiratory disease was reported noted at PDS. This was also reflected in the practitioners' survey, with one veterinarian rating BCoV associated with pneumonia **Increasing** relative to last year. This was seen primarily in pre-



weaning beef calves.

It's important to note that cattle vaccinated with live strain may be PCR positive for some time, since current PCRs cannot distinguish between field and vaccine strains.

QUESTION: what vaccine is being used for respiratory disease?

- There is no specifically licensed vaccine in Canada for preventing respiratory coronavirus. However, there is one in Europe.

QUESTION: Do we know how close respiratory BCoV is genetically to scours BCoV?

ANSWER: in our limited data, separate respiratory and scours sequences may cluster together [suggesting the scours and respiratory strains may have some genomic differences].

UPDATE: BCoV SEQUENCING PROJECT AT PDS

- We are sequencing the BCoV gene for the spike protein, originally targeting intestinal samples.
- Now we are expanding to also study respiratory samples. We are finding a variety of strains, all phylogenetically distant from the original [vaccine] strain.

Digestive system

Diarrhea associated with *E. coli*, Rotavirus, Coronavirus, *Cryptosporidia*, and *Clostridia* were all rated Stable by network practitioners with the exception of *Cryptosporidia* which was rated **Increasing** by one practitioner. Laboratory data were Stable for all of these pathogens for this year relative to last year.

QUESTION: if you are seeing an increase in *Cryptosporidia* infections in your practice, do you have ideas regarding why?

ANSWER: we are seeing an increase in beef herds in our practice maybe for a couple of reasons:

- The price of calves currently means producers are more interested in doing diagnostics. We are more likely to see it in black and white beef calves ie beef-on-dairy- crosses. [*Cryptosporidia* infection is reported frequently in dairy calves].

In contrast with respiratory-associated detections, Bovine coronavirus detections associated with scours infections at diagnostic laboratories continued Stable.



Reproductive disease

Case report: Ureaplasma abortion

History: roughly 6-month-gestation male bovine fetus that has complete absence of hair and measures 60 cm from crown to rump (weight = 6.36 kg). No placenta was submitted [which is an oversight since the placenta often has important diagnostic clues].

Morphologic Diagnoses:

- a) Joints (right and left hip and left stifle):
Severe, chronic, destructive arthritis.
- b) Lungs: Pneumonia.
- c) Eyelid: Minimal conjunctivitis (pinkeye).
- d) Small intestine: Mild inflammation.

Final diagnosis: Ureaplasma associated abortion (PCR positive).

Takeaways: Ureaplasma bacteria may be found in the reproductive tract of healthy cows, but can also be associated with infertility and abortion. There is no vaccine available. WeCAHN monitors the western Canadian laboratory isolations of Ureaplasma, and these have remained Stable over time. However, it's maybe a less familiar potential pathogen. A good writeup on Ureaplasma appeared in the Western Producer a couple of years ago: <https://www.producer.com/livestock/ureaplasma-may-be-overlooked-diagnosis-for-abortion/>



C3SN benchmarking of calving season performance indicators

A recent publication summarized some of the benchmarking work done by the Canadian Cow-Calf Surveillance Network, or C3SN.

Waldner C, Windeyer MC, Rousseau M and Campbell J (2024) The Canadian Cow-Calf Surveillance Network – productivity and health summary 2018 to 2022.

Front. Vet. Sci. 11:1392166. doi: 10.3389/fvets.2024.1392166

Median* values for calving assistance, based on 379 western Canadian herd calving records between 2019-2022

% Females calving assisted:	Cows = 2.3%
	Heifers = 12.5%
% Females with easy pull	Cows = 1.2%
	Heifers = 6.7%
% Females with hard pull	Cows = 0.7%
	Heifers = 3.3%
% Females with Caesarean section	Cows = 0
	Heifers = 0

*Median = the midpoint of the data, with half of the observations falling above, and half below. Note that median values of zero don't mean that there was no illness or death reported by any participants, but that at least half of the surveyed herds didn't report any.

QUESTION: relative to recently published benchmarking, how do you think your clients compared this year?

ANSWER: The published percentage of hard pulls especially in calves looks relatively high compared with our clients.

RESPONSE: the definition of hard pull used in the survey was use of a calf jack, which a lot of producers or veterinarians might disagree with.

QUESTION: in the analysis of consecutive years' data in the survey, did you see a year effect?

ANSWER: we did, although this was biggest at the individual herd level.

QUESTION: how did calving season go in your practice considering reproductive performance e.g. % of pulls?

ANSWER:

- i. Pretty normal.
- ii. Calving numbers similar to usual in our area - lower heifer numbers due to continued drought and the guys with skinny cows don't often call for dystocias.

Takeaway: reassuring to hear performance was relatively normal given the drought last year. With the short interval required between calving and re-breeding to maintain an acceptable length-distribution of calving dates next year, it's tough to maintain momentum if cows/heifers are skinny and/or late.

Median* values for calf sickness and mortality from 24 h to 30 d, based on 565 western Canadian herd calving records between 2019-2022

Waldner C, Windeyer MC, Rousseau M and Campbell J (2024) The Canadian Cow-Calf Surveillance Network – productivity and health summary 2018 to 2022. *Front. Vet. Sci.* 11:1392166. doi: 10.3389/fvets.2024.1392166

% Calves dead 24h to 30d: Cows = 1.3%
Heifers = 0%

% Calves reported treated with antibiotics 24 h to 30 d
Scours = 0.9%
Respiratory disease = 0.7%
Navel or joint ill = 0.0%

% Calves dead with attributed cause 24 h to 30d
Scours = 0.0%
Respiratory Disease = 0.0%
Navel or joint ill = 0.0%

Median = the midpoint of the data, with half of the observations falling above, and half below.

Note that median values of zero don't mean that there was no illness or death reported by any participants, but that at least half of the surveyed herds didn't report any.

QUESTION: how did calving season go in your practice considering calf health e.g. % of mortality to 30 days?

ANSWER:

- Exceptional maybe due to our dry weather.
- Similar to last year; maybe better since clients more inter-

Meeting Takeaways

- HPAI: To date still there have been no detections of HPAI in beef cattle. Our understanding of the virus will continue to change as it is increasingly studied. However, producers can act to mitigate their risk by employing good biosecurity practices which they may already have in place.
- Bovine Coronavirus: (BCoV): Detections of BCoV have been reported from cases of clinical pneumonia, with no other pathogens found. The significance of these observations is still unclear. Currently we can't distinguish between vaccine and wild strains of BCoV on diagnostic PCR tests.
- Some good news: Network veterinarians reported relatively normal calving season metrics in the aftermath of the 2023 drought.

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