



Animal Health Perspectives

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There's a New CVO in Town

By: *Dr. Stephanie Smith, Chief Veterinary Officer, Saskatchewan Ministry of Agriculture*

Who on earth could ever replace Dr. Betty Althouse? That is a question that I have asked myself many times. After getting to know Betty over many years, throughout my veterinary education and career, I was so impressed with her level of knowledge, professionalism and dedication to animal health and welfare and I found it hard to believe that anyone would be brave enough to take her place. So how did I manage to obtain the position of Chief Veterinary Officer? Let me tell you about my journey.

Born and raised on a farm in Saskatchewan, my appreciation and respect for the agricultural industry began early in life. My thirst for knowledge and a deep admiration for my province guided me through my education and I knew that my path in life was to make a positive impact on animal health and welfare in Saskatchewan.

Working first in private practice, I was enthused with the opportunities that mixed practice provides, where I



Dr. Stephanie Smith, CVO

could learn something new every day, work with different species, different diseases and a variety of clients. I always envisioned myself as a jack of all trades – continuously learning new things and having the ability to find the answer, regardless of whether the problem was affecting chickens, ferrets or sheep. I began to appreciate the challenges faced by our veterinary profession as well as our livestock and poultry industries and I wondered how I could make things better.

An opportunity to work with the poultry industry was eye-opening. Moving from a role in general practice to something more specialized was a shift in my thinking. This opportunity expanded my knowledge of the challenges our industries face and reminded me that I wanted to think bigger in order to satisfy my need to make a broader impact on animal health and welfare for all species.

I joined the Ministry of Agriculture in the Livestock Branch as the Animal Health Veterinarian Intern in 2018. Given my strong interest in regulatory medicine and animal welfare, this position was a natural fit. Working with the Ministry meant that I could continue to expand my knowledge and provide a positive impact for animal health and welfare in a way that would benefit our Saskatchewan agricultural producers. I then moved into the position of Animal Health and Welfare Veterinarian for a short period of time, where I gained a better understanding of the animal welfare

challenges we are facing. While I had intended to stay in this position for the foreseeable future, the challenges and opportunities provided by the CVO position were too exciting to resist. Looking at the wide array of challenging files that Betty worked on, I knew that I wanted my chance to make a difference as the CVO someday. What luck that the opportunity presented itself now, instead of having to wait for “someday”!

Becoming CVO early on in my career will certainly have its challenges but also some incredible opportunities. I am fortunate to be surrounded by an incredibly knowledgeable and innovative team, on whom I know I can rely. I will bring my own perspective to a government role, with my background in private practice, industry and as a cattle producer. I look forward to growing in this position and getting to know more of our veterinary community and continuing Betty's incredible work to the betterment of animal health and welfare in our province and beyond.

Mycotoxin Contamination in Western Canada

By: Barry Blakley, Veterinary Toxicologist, WCVM; Victoria May and Taylor Ogilvie, PDS, Toxicology Laboratory

Background:

Mycotoxins are secondary fungal metabolites produced by a variety of molds. Worldwide, many different types of mycotoxins are produced. Specific mycotoxins produced vary from region to region. This variability is related to temperature, moisture, type of crop and agricultural practices such as crop rotation, fungicide application, roadside plant control, and no till management.

Most mycotoxins are extremely potent and produce clinical disease at very low concentrations. Analytical detection is a challenge. Rapid metabolism and elimination from tissues further compromise analytical options. Mycotoxins are a feed-related problem and are not typically associated with water or air contamination in livestock.

Characteristics of Mycotoxin Poisoning in Livestock:

1. Often a vague problem. Molds don't grow uniformly in feed and mycotoxin production is highly variable. Intermittent low-concentration exposure is common
2. Sick animals do not respond to antibiotics
3. Outbreaks are often seasonal, primarily winter
4. Geography and climate are important
5. Problems are often associated with feed or a change in feed (feed refusal is common)
6. Fungal growth or mold in the feed is not a reliable indicator of mycotoxin content
7. Usually it is a herd problem

Analytical Assessment:

Mycotoxins or groups of mycotoxins affect specific systems. Therefore, it is important to characterize the

clinical disease and evaluate all mycotoxins that could produce the disease. Consequently, it is important to test for a variety of mycotoxins in the feed as effects may be additive. Many mycotoxin-related disease problems are both time- (of exposure) and dose-dependent. Exposure over a long period of time at a low dose may produce similar effects as a higher dose over a shorter period of exposure. Since each mycotoxin or group of mycotoxins may produce different effects, the highlights for each mycotoxin will be briefly summarized:

1. AFLATOXIN

Associated with *Aspergillus flavus* typically. Several mycotoxins are in the group B-this is most common.

Clinical features:

- Liver disease
- Carcinogenic
- Poor performance

Aflatoxin is rarely observed in most parts of Western Canada unless the feed has been imported from the USA.

2. ZEARELENONE

Associated with *Fusarium* species

Clinical features:

- Estrogenic properties
- Infertility, anestrus

Zearalenone is not frequently encountered in Western Canada. In the USA, this is a common problem in corn crops.

3. TRICHOHECENE MYCOTOXINS

Associated *Fusarium* fungi.

- There are several mycotoxins in the group with varied potencies:

HT-2 toxin, T-2 toxin, deoxynivalenol (vomitoxin, DON) plus 3 and 15-acetyldeoxynivalenol, nivalenol (NIV), diacetoxyscirpenol (DAS)

- Relative potencies:
HT-2 toxin = 50-fold more potent than DON and others
T-2 toxin = 5 fold more potent than DON and others

- During assessment of feed quality, differences in potency must be considered.

Clinical features:

- Feed refusal
- Dermal necrosis
- GIT irritation
- Immunosuppression
- Embryo toxicity, possible abortion

Tricothecenes are a common problem in Western Canada

4. ERGOT

Associated with *Claviceps* species and *fescue* species. A common problem in Western Canada. Marked species susceptibility.

Clinical features:

- Gangrene
- Feed refusal
- Convulsions (not common in Western Canada)
- Abortion (not common in Western Canada) –
- Agalactia (reduced prolactin)

Horses and sheep are highly susceptible to milk production losses. Effects often observed during winter months. Livestock standards in feed vary widely from country to country. **Clinical disease in livestock has been observed at concentrations below current CFIA regulatory standard.**

Ergot mycotoxins (alkaloids and epimers) vary widely in feeds. The current standards in most countries are based exclusively on the ergot alkaloid total concentration. However, the epimers may also have pharmacological activity. The total ergot alkaloid and epimer concentration must therefore be considered when evaluating feed quality. Ergot contamination of crops is highly variable from region to region and is dependent upon crop type (cereal and grass crops are susceptible) and level of rainfall in the spring months.

5. OCHRATOXIN

Associated with *Aspergillus* and *Penicillium* molds. There are several ochratoxin mycotoxins such as Ochratoxin A.

Clinical features:

- Kidney damage

The clinical significance in Western Canada is variable.

6. FUMONISIN

Associated with *Fusarium* species.

- Clinical disease associated with Fumonisin B1 or B2 has not been confirmed in Western Canada

There is marked species differences and susceptibility. In horses, it produces a neurological problem, whereas in swine, it produces a respiratory syndrome. Cattle and poultry are more resistant to clinical disease.

Species Differences:

Susceptibility to various mycotoxins is highly variable, species to species. Consequently, the clinical manifestations may also vary. In cattle, dairy breeds may present a special concern. In general, dairy breeds may be four-fold more susceptible compared to beef breeds. In some instances, monogastric species may be more susceptible compared to ruminal species. There are exceptions to this statement, it is therefore important to contact a nutritional specialist or consult species-specific guidelines.

Sampling Concerns/Tips:

Proper representative sampling of feedstuffs is vital for obtaining accurate analytical results. A few infected grains can lead to heavy contamination of the sample which may not reflect the overall suitability of the feed. As well, a sample that does not adequately represent the feed may give a “cleaner” result than is actually the case. Approximately 90% of the variability observed in analysis is related to sample collection.

Corn: Grazing standing corn presents a unique problem. The contamination is almost exclusively in the cob. Since cattle graze the entire plant, submission of chipped plants including the cob is recommended. Animals that preferentially graze the less palatable stems and leaves may suggest the cobs are heavily contaminated. The extent of visual mold growth is usually a poor indicator of mycotoxin contamination. Analysis is, therefore, critical.

Swath-grazing Crops:

Generally, mold growth on

swathed crops occurs after swathing. This late season mold growth does reduce feed quality, but mycotoxin production is typically limited, although some risk is possible.

Blended Grain/Pellets: it is important to check that blended grains/pellets are safe for consumption. Testing is critical to ensure that these blends are below toxic levels, especially when sources for the blends/pellets are not known.

Sample Analysis:

Prairie Diagnostic Services (PDS), through the purchase of two brand new Ultra High Performance Liquid Chromatography- Tandem Mass Spectrometers (UHPLC-MS/MS), is now able to offer clients comprehensive panels for mycotoxin and ergot analysis:



Mycotoxin Panel: evaluates 11 analytes (Deoxynivalenol (Vomitoxin); 3+15 – acetyldeoxynivalenol; Nivalenol; Diacetoxyscirpenol; Aflatoxin B1; Ochratoxin; Fumonison B1; Fumonison B2; Zearalenone ; T-2 Toxin; HT-2 Toxin)

Further Information:

General guidelines and information with regards to maximum allowable concentrations in feed as well as species/age/mycotoxin specific considerations can be found on the CFIA website: www.inspection.gc.ca (search “RG-8”).

For any enquiries regarding sample analysis, please go to www.pdsinc.ca.



Ergot Alkaloid Panel:

evaluates 6 alkaloids as well as their corresponding epimer (Ergocornine + Ergocorninine; Ergocristine + Ergocristinine; Ergocryptine + Ergocryptinine; Ergometrine + Ergometrinine; Ergosine + Ergosinine; Ergotamine + Ergotaminine)

Interpretation of Feed Analysis

The evaluation of mycotoxin analysis in feed samples is complex. Species differences, mycotoxin interactions, duration of exposure, climatic conditions, etc. make interpretation a challenge. Following consultation with various websites, it is recommended that you contact the feed specialist in the laboratory. Proper interpretation of results depends on many factors such as species for which feed is intended, age of animals, amount of feed provided to animals, and if sample is a proper representation of the feed being tested.

BE SAFE, BE SURE, TEST TODAY

PDS News

FAREWELLS:

Kazal Ghosh (PDS Surveillance Microbiologist):



Dr Kazal Ghosh accepted a position with the Animal Health Centre, Abbotsford, BC in mid September 2020. Kazal is interested in working with fish and we are sure his new position will provide him with plenty of opportunity to indulge his personal interest. We wish Kazal and his family every success and happiness as he takes this new direction in his career. We also thank him for his outstanding dedication, skills and contributions while we were fortunate to have him at PDS these past three and a half years.

Erin Zachar (PDS Anatomic Pathologist)



We are sad to have bid farewell to Dr. Erin Zachar in mid-September. After almost 4 years with PDS, Erin accepted a position with the Faculty of Veterinary Medicine, University of Calgary in August 2020. Dr. Zachar is a 2007 WCVN graduate, an Alberta local and a member of a veterinary family. She returned to WCVN after about 6 years of mixed and small animal practice. She received a MVSc degree and completed a senior residency in Veterinary Anatomic Pathology in the Department of Veterinary Pathology, WCVN. Erin's diagnostic expertise, augmented by her clinical experience; positive attitude to life and approachable nature will be greatly missed by everyone in PDS. Good luck on your new adventure Erin!!

CONGRATULATIONS:



Dr. Sarah Wood (PDS Anatomic Pathologist) successfully defended her PhD thesis on Oct 5th, 2020. This is an important personal achievement for Sarah. Her friends and colleagues in PDS and the Department of Veterinary Pathology, WCVN are very proud of Sarah's dedication in completing this goal.

READERS' FEEDBACK

The **Animal Health Perspectives** editorial team (Dr. Moira Kerr and Kathryn Tonita) invite readers' comment on material published in the newsletter or questions on material submitted by contributors.

Submit your comments or concerns to Dr. Moira Kerr (email: moira.kerr@pds.usask.ca) and they will be forwarded appropriately.