# Animal Health Monitor

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BRITISH COLUMBIA | Ministry of Agriculture

## Articles of Interest:

- ***Bovine Abortions in Fraser Valley***
- ***Polarized Debate About Neonicotinoids***
- ***Pacific Agriculture Show Highlights***

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## Update on New Regulations Coming in Under the New *Animal Health Act* by Dr. Jane Pritchard

The new *Animal Health Act* was passed by the legislature in spring 2014 and has three main goals:

1) to assist in protecting human health through the early detection and management of zoonotic diseases;
2) to ensure the continued productivity and competitiveness of farm operations in BC through on-farm prevention strategies, early detection and eradication of animal diseases; and
3) to minimize the likelihood of interprovincial or international trade closures by effectively managing animal disease outbreaks.

The Act was brought into force in January 2015 and made operational by a total of 7 regulations.

The Act and the regulations place more accountability on persons responsible for animals to ensure that on-farm practices prevent to the greatest degree possible, the occurrence and spread of disease. The accountability focus also places responsibility on practicing veterinarians as they are the most likely persons to become suspicious of, and to confirm a notifiable or reportable disease.

The Reportable and Notifiable Disease Regulation is one of the seven regulations under the *Animal Health Act* (*AHA*) which was passed in 2014 http://www.leg.bc.ca/40th2nd/3rd_read/gov19-3.htm#section23.

**Some key features of the new Reportable and Notifiable Disease Regulation:**

This new regulation expands the scope of provincial authority for disease control from 16 diseases to over 120. The diseases listed in this regulation align with similar lists prescribed by other provincial governments and the government of Canada.

The *AHA* defines reportable and notifiable diseases as follows:

- "reportable disease" means an environmental toxin, infestation, syndrome or transmissible disease that is prescribed as a reportable disease for the purpose of implementing preventive, control or eradication measures
  a) to safeguard animal health,
  b) to safeguard public health in relation to environmental toxins, infestations, syndromes or transmissible diseases that are or may be transmissible from animals to humans,
  c) to avoid barriers to trade, or
  d) for other reasons in the public interest.
- "notifiable disease" means an environmental toxin, infestation, syndrome or transmissible disease that is prescribed as a notifiable disease for the purpose of implementing monitoring measures
  a) to determine its presence, identity, nature, effects or spread,
  b) to avoid barriers to trade, or
  c) for other reasons in the public interest.

Reportable diseases include transmissible diseases, environmental toxins, infestations and syndromes. Some reportable diseases are zoonotic.

The regulation also requires that a person who has reasonable grounds to suspect that a reportable or notifiable disease has occurred must make a report within 24 hours to the office of the Chief Veterinarian. In most cases this will be the practicing veterinarian. Procedures and information requirements for making such a report are prescribed in the regulation, including requirements for retaining samples and records.

If you have any questions, please email me at Jane.Pritchard@gov.bc.ca

## Bovine Abortions by Devon Wilson, WCVM, Saskatoon

*Devon Wilson, Western College of Veterinary Medicine, Saskatoon, SK*
*Karin Orsel, University of Calgary, Calgary, AB*
*Josh Waddington, Greenbelt Veterinary Services, Chilliwack, BC*
*Tomy Joseph, Animal Health Centre, Abbotsford, BC*
*Amy Sweeney, National Institutes of Health, Bethesda, MD*
*Mike Grigg, National Institutes of Health, Bethesda, MD*
*Stephen Raverty, Animal Health Centre, Abbotsford, BC*

Abortion is an important fertility disorder, significant cause of economic loss to dairy producers and may be due to a variety of infectious and non-infectious processes. One of the most important infectious causes of bovine abortions worldwide is *Neospora caninum*, which also causes neurologic and musculoskeletal disease in domestic dogs, coyotes and other wild canids. A project supported by *Growing Forward 2 (GF2)*, a federal-provincial-territorial initiative, is currently underway to investigate the natural history of *N. caninum* in dairy herds and wildlife in the Fraser Valley, BC. The first phase of this study determined the causative agents of bovine abortions and described the prevalence, signalment and potential risk factors associated with *N. caninum* abortions in BC Animal Health Centre (AHC) submissions.

A database was created to compile information from pathology records of 236 bovine fetal submissions from 2007 to 2014. Of the 236 fetal submissions, 182 were routine diagnostic cases and 54 were actively recruited from dairy farms in the Upper Fraser Valley region initiated in July 2013. The causes of bovine abortion were determined based on review of necropsy examinations and diagnostic testing for all submissions. A confirmed cause was identified in 44% of submissions; 15% bacterial, 15% protozoal, 4% viral, 3% nutritional, 2% developmental, 1% fungal, and 4% mixed infections. *Neospora caninum* was associated with 24% of cases and was diagnosed in 48% of actively recruited fetuses compared to 16% of routine submissions. This data confirms that *N. caninum* is the most significant cause of infectious abortion in dairy cattle in the Fraser Valley, and that active surveillance may reflect a higher and more accurate rate of infection in Fraser Valley dairy herds.

Using data from Statistics Canada and review of archived case records from the AHC, the proportion of farms that submit bovine abortions for fetal examination to AHC was calculated. Between 1% and 5% of BC dairy farms submit fetuses per year for routine diagnostics. This proportion of farms submitting case material was surprisingly low and indicates that diagnostic tools are not commonly used when managing fetal abortions. Increased vigilance and post mortem diagnostic evaluation would establish baseline health trends, as well as improve understanding of endemic and potentially emerging disease agents causing bovine abortions on an individual herd basis, as well as provincially.

Potential risk factors of *N. caninum*-associated abortions were also analyzed, and while the diagnosis of neosporosis is made in virtually all months of the year (with the exception of May), protozoal abortion may be correlated with month of submission. Though statistical analysis was not performed on the data, it appears that more diagnoses were made in the late summer and fall compared to the spring. In addition, dairy-bred fetuses had a significantly greater risk of being associated with *N. caninum* compared to beef breeds. There did not appear to be a difference in the prevalence of *N. caninum* associated with fetuses submitted from heifers compared to those submitted from multiparous cows, though many cases records did not report cow parity.

The findings of the first phase of this *GF2* initiative indicate that *N. caninum* is an important cause of infectious bovine abortions in BC and laboratory diagnoses can provide valuable information for veterinarians and producers. Fetal diagnostic services are not commonly used and active surveillance increased diagnosis of neosporosis, indicating improvements could be made in *N. caninum* detection resulting in on-farm risk factor management of the disease.

## Cryptococcus gattii TYPE VGIIa Infection in a Harbor Seal (*Phoca vitulina*) in BC, Canada by Dr. Stephen Raverty

*Justin F. Rosenberg,[1*] Martin Haulena,[1] Linda Hoang,[2] Muhammad Morshed,[2] Erin Zabek,[3] and Stephen A. Raverty[3]*

[1]*Vancouver Aquarium Marine Science Center, Vancouver, British Columbia, V6G 3E2, Canada*
[2]*BC Center for Disease Control, Vancouver, British Columbia, V5Z 4R4, Canada*
[3]*Animal Health Centre, BC Ministry of Agriculture, Abbotsford, British Columbia, V3G 2M3, Canada*

Since the late 1990s, cryptococcosis has been an emerging disease of humans and animals in the Pacific Northwest. After initial detection in humans and companion animals on Vancouver Island, BC in 1998, the incidence of *Cryptococcus gattii* in western Canada is now among the highest world-wide. *C. gattii* has been documented in a variety of wildlife and domestic species and has been implicated as the cause of pneumonia in marine mammals, specifically porpoises and dolphins. Despite intensive recovery efforts to recover and screen beach cast and dead seals for fungal infections, to date no cases of *C. gattii* have been identified in pinniped species, although there is one report of a California sea lion (*Zalophus californianus*) with a *Cryptococcus albidus* infection. This report documents the first case of *C. gattii* in a harbor seal (*Phoca vitulina*).

A case of systemic *C. gattii* was diagnosed in an approximately 3 week old female harbor seal. This animal was presented to Vancouver Aquarium's Marine Mammal Rescue Centre from Roberts Creek, BC. On initial assessment, the animal was dehydrated and malnourished and there were multiple draining puncture wounds on the hind flippers. Within 3 days after being admitted, the pup died and a large volume of mucohemorrhagic discharge was observed around the nares. Post mortem examination and histopathology revealed generalized lymph node enlargement, bronchopneumonia, meningoencephalitis, fungemia, and multiple granulomas with intralesional yeast. Fungal culture from lung and lymph node confirmed heavy growth of *C. gattii* type VGIIa. This is believed to be the first case of cryptococcosis in a harbor seal in the northeastern Pacific region and the implications of cryptococcosis for pinniped population health have not yet been determined.

## Pancreatic Islet Amyloidosis in an Adult Cat by Dr. Stephen Raverty

A 15 year old 4.5 kg adult was recently presented to the Animal Health Centre. After a protracted course of progressive mental deterioration and multiple cranial nerve deficits, the animal was euthanized and presented for post mortem examination. A suspect brain tumor or possible meningoencephalitis were differentials. The animal was in fair body condition and the most significant findings at necropsy were marked focal nodular enlargement of the pancreas, which extended up to half the width of the duodenum, enveloped and partially compressed the lumen of the adjoining segment bowel and hepatomegaly. The mass was multinodular, tan yellow smooth and homogeneous on cut surface. Microscopically, there was multifocal acinar cell nodular hyperplasia and diffusely, the islets were expanded and effaced by dense homogeneous to finely wavy material. Additional recuts and Congo red stains revealed apple green birefringence with polarized light (amyloid). The diagnosis was marked islet amyloidosis with multifocal exocrine nodular hyperplasia. In addition, hepatic lipidosis and coronary arteriosclerosis were observed. There were no apparent lesions in multiple levels of brain and cranial nerves and the most likely cause of the neurologic deficits were metabolic derangements associated with the pancreas and liver lesions. No significant bacteria were recovered from sampled tissues and pooled samples were negative by polymerase chain reaction for feline herpesvirus and feline corona virus.

In cats, the highest incidence of islet amyloidosis is in animals over 8 years of age and castrated males tend to be more commonly affected than females. The cause of this localized primary disorder of amyloidosis has not yet been fully resolved, but involves beta cell IAPP protein production, usually associated with obesity and impaired glucose tolerance. This condition is also reported in humans, non-human primates, raccoons, cattle and transgenic mice.

## The Polarized Debate About Neonicotinoids by Paul van Westendorp

Neonicotinoid insecticides remain an intensely debated topic, involving environmental groups, governmental agencies, farming communities, pharmaceutical industries, academics and the public. So, why have neonicotinoids become so controversial?

Neonicotinoids belong to a class of insecticides introduced in the 1990s that have proven very effective in controlling insect pests in agriculture. Their systemic action, relatively low mammalian toxicity and ease of application have made these products the most widely-used insecticides in the world. Their popularity is partly due to having replaced the far more dangerous organophosphates, organochlorines and carbamates.

In 2000, French beekeepers began reporting high colony losses near corn and potato field plantings. Even though neither one of these crops were forage sources of bees, it was speculated that the systemic neonicotinoid insecticides were silently poisoning the environment and killing non-target organisms through their chronic presence in the environment at sub-lethal levels. Reports of similar losses in other parts of Europe led regulatory agencies to initiate numerous studies of determining the true impact of neonicotinoids on the environment.

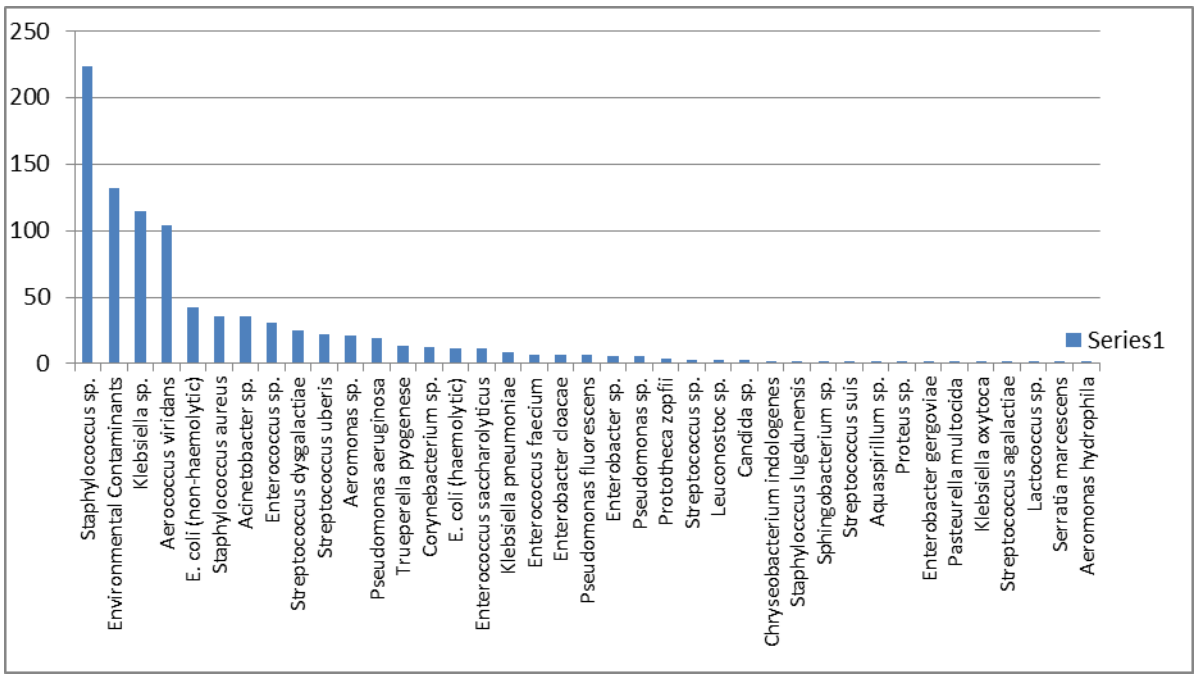
The speculation that neonicotinoids were in some way implicated with the decline of pollinator populations became an entrenched belief among environmental groups and organizations. While numerous peer-reviewed studies failed to detect any residues or observe abnormalities in pollinator populations, opponents have persistently claimed that pollinator declines are attributable to chronic neonicotinoid exposure at sub-lethal levels. Such exposure would cause irreversible nerve damage leading to a various physiological and behavioural abnormalities including spacial disorientation, loss of floral fidelity during foraging, disruption in mating and nesting behaviour. Despite these claims, numerous studies have so far failed to establish a correlation between pollinator population declines and neonicotinoid use when applied correctly.

Reports of declining pollinator populations world-wide have received widespread media attention and have fuelled the public's fear of environmental degradation. It has also made the public receptive to accepting claims without empirical evidence. This has led to the curious situation where hundreds of peer-reviewed scientific studies that have found no correlation between neonicotinoids and pollinator declines, are dismissed while extraordinary legitimacy is given to a few studies of questionable scientific merit that claim such correlation.

Declines in the diversity of pollinator species have been documented for many areas, especially in agricultural regions with a shift towards a numerical increase of a few dominant pollinators. The declines of many wild pollinator species worldwide can be attributed to a range of biotic and abiotic factors including pathogens, nesting habitat destruction, habitat fragmentation, mono-cultural farm practices, unsustainable apicultural practices, and pesticides. Neonicotinoid insecticides have so far not been identified as a cause to pollinator declines.

## Milk Culture Results by Dr. Jane Pritchard

January 1—December 31, 2014—Results of milk cultures sorted by frequency of isolation.

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* The following isolates were single occurrences during the period of January 1-December 31, 2014, and not included in the chart above: Aerococcus urinae, Alcaligenes sp., Candida krusei, Citrobacter koseri, Corynebacterium bovis, Enterococcus faecalis, Kodamaea ohmeri, Lactococcus lactis, Mannheimia varigena, Myroides sp., Paracoccus sp., Proteus mirabilis, Pseudomonas cedrina, Raoultella terrigena, Serratia sp., Staphylococcus epidermidis, Streptococcus bovis, Streptococcus lutetiensis, and Weeksella sp.

Between January 1 and December 31, 2014, 1109 milk samples (244 submissions) were received for culture and sensitivity at the Plant and Animal Health Centre. Out of the 1109 samples submitted, no bacteria was isolated in 424 samples.

| Resistance by Isolate | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | amp | kf | ob | e | xnl | p10 | pyr | sxt | tet | # of isolates tested |
| Staphylococcus sp. | 5% | 0% | 6% | 4% | 1% | 5% | 8% | 1% | 6% | 223 |
| Klebsiella sp. | 71% | 17% | 70% | 72% | 12% | 72% | 72% | 1% | 10% | 115 |
| Aerococcus viridans | 1% | 1% | 16% | 4% | 2% | 2% | 4% | 8% | 10% | 104 |
| E. coli (non-haemolytic) | 45% | 40% | 86% | 86% | 14% | 86% | 86% | 14% | 17% | 42 |
| Staphylococcus aureus | 3% | 0% | 0% | 6% | 0% | 3% | 3% | 0% | 6% | 36 |
| Acinetobacter sp. | 8% | 22% | 31% | 11% | 3% | 11% | 31% | 3% | 11% | 36 |

| | | | | |
|---|---|---|---|---|
| amp – ampicillin | ob – cloxacillin | xnl – excenel | pyr – pirlimycin | sxt – sulfamethoxazole/ trimethoprim |
| kf – cephalothin | e – erythromycin | p10 – penicillin | tet – tetracycline | |

## 17th Annual Pacific Agriculture Show
## January 29-31, 2015
## Abbotsford Tradex

The 3-day event was attended by over 7,500 visitors and there was a record turnout of 300 exhibitor booths. There was so much interest in exhibitor space that 45 companies were left on a wait list.

The Ministry of Agriculture booth was represented by staff from the Plant and Animal Health Branch, Food Safety and Inspection Branch, Sector Development Branch, Business Risk Management Branch, and the Innovation and Adaptation Services Branch, at the 17th Annual Pacific Agriculture Show.

Animal Health Centre
1767 Angus Campbell Road
Abbotsford BC V3G 2M3

Toll free (BC only):
1-800-661-9903
Phone: 604-556-3003
Fax: 604-556-3010

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http://www.agf.gov.bc.ca/ahc/AHMonitor/index.html

Send correspondence to:

Rosemary Pede
Email: Rosemary.Pede@gov.bc.ca
Phone: 604-556-3065
Fax: 604-556-3015

To receive this newsletter electronically, contact Lynette.Hare@gov.bc.ca