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Animal Health Perspectives

Animal Welfare Updates

By: Betty Althouse, DVM, Director Animal Heath and Chief Veterinary Officer. Saskatchewan Ministry of Agriculture.

As part of its mandate to protect the health and welfare of animals in Saskatchewan, the Ministry of Agriculture recently replaced *The Animal Protection Act, 1999* with *The Animal Protection Act, 2018*, and proclaimed updated *Animal Protection Regulations*.

For veterinarians, a major change in the new Act is the requirement for them to report suspected cruelty cases.

WHAT'S INSIDE

While veterinarians always had the ethical obligation to report such cases, there was no law requiring them to do so, until now.

While many parts of the old Act have been reworded or updated, there are a few new provisions to be aware of. One of the first changes in the new Act is the term "animal protection agency." This term applies to organizations, including humane societies that enforce the new Act and employ animal protection officers. Animal Protection Services of Saskatchewan, Regina Humane Society, Saskatoon SPCA and Prince Albert SPCA have been designated as animal protection agencies.

The term "abandoned animal" has been added to the definitions. This does not mean animals that are running at large, but rather those left behind when people move, or that are left unclaimed after a service, such as boarding. The new Act allows an animal protection officer (APO) to take an abandoned animal into custody and deliver them to an animal protection agency or caretaker. Previously, action could not be taken unless such animals were in distress.

So, what is "distress"? The new Act has a very detailed description of distress. It has been expanded to include: deprived of food and water to maintain an animal's health, deprived of veterinary care or medical attention, not protected from injurious temperatures, an animal kept in conditions that are: unsanitary, impair the animal's health over time, cause extreme anxiety or suffering, or an animal abandoned by the owner or person responsible which will or may cause distress.

The Act continues to use standards, code of practice, or guidelines, listed in the new regulations, to guide what is considered appropriate practice and use of animals. This is especially important for those who manage livestock, as if they are following the Code of Practice for the species, they are not causing distress.

Animal Care Duties have been added and every person responsible for an animal has a duty to provide for their care. The new Act includes a section detailing what these duties involve. This section also states that animals cared for in accordance with the appropriate standard, code of practice or guideline will be considered as being provided adequate care.

The new Act provides greater detail of the actions an APO can take in a suspected cruelty case and expands locations that are subject to inspection, while also ensuring a fair approach for the person responsible for the animal. APOs previously had the ability to take any action to relieve an animal in distress, following guidelines in the Act. Now, APOs can also take a more proactive approach and investigate cases where animals are likely to be in distress and act to prevent distress.

Corrective Action Orders are described, and APOs can order any corrective action needed to prevent or relieve distress of animals. The orders specify the timeframe in which corrective actions must take place and the APO can follow up and ensure that orders are followed.

There are some important initiatives taking place outside of legislation, as well.

The welfare of animals in Saskatchewan involves multiple agencies. The Ministry of Agriculture hosted two invitational facilitated animal welfare engagement meetings in October 2015 and January 2017 to identify and clarify roles of partners actively involved in animal welfare, and to promote a collaborative approach. Key players, roles and possible actions have been identified and a third meeting will be held on October 30th, 2018.

Research shows that there is a direct link between the welfare of animals and humans. **Animal welfare investigations and interventions often require human service providers. Some examples include domestic squalor, hoarding, complications associated with aging, mental health and domestic violence. To better respond to these complex cases, an interagency human and animal welfare task team has been formed. The task team is comprised of representatives from animal protection, police, veterinary social work and relevant government Ministries, such as Health, Corrections and Policing and Social Services, and is lead and coordinated by the Ministry of Agriculture.** We aim to improve responses in cases where both human and animal welfare are compromised. The second meeting of the task team will occur in November.

Animal welfare is an important component of animal health. For veterinarians, it is important to stay current on legislative changes, and your responsibility

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to report animal neglect or abuse. Consider developing an animal cruelty response protocol for your veterinary clinic, and be proactive when you see compromised animal welfare. Consider educating producers on the Codes of Practice, and check out the Canadian Agriculture Partnership (CAP) assurance systems programs producer rebate on Saskatchewan.ca. The program supports veterinarian involvement with on-farm animal welfare and provides assistance for producers to make welfare improvements.

BVD Testing News

By: Dale Godson, PDS, Diagnostic Immunologist/Virologist

I would like to make everyone aware of a change in our test method for detecting BVD persistently infected (PI) animals. ***Due to limited antibody reagent availability, we are switching from immunohistochemistry (IHC) to PCR tests. The important consequence of this change is that fresh, not formalin-fixed ear notch samples are required.*** Otherwise, the sampling procedure is quite similar and a more detailed instruction sheet can be obtained from the PDS website: http://www.pdsinc.ca/Portals/0/BVD%20Sampling%20Instructions%202018.pdf

Samples can be tested in pools of up to 10 animals, so the cost/animal when doing herd screening is similar to the IHC test. Submit individual samples and pooling will be done at the lab. If a pool is positive, the individual positive animals will be identified at no extra cost.

PCR testing cannot reliably discriminate between transient and persistent infection; thus retesting of the animal after 3 weeks is recommended for confident determination of PI status.

BVD PI HERD SCREENING

Animals persistently infected with BVDV are the primary reservoir for BVD infection in cattle, shedding large amounts of virus throughout their lives. Thus, identification and removal of PI animals from the herd is the major focus of BVD control programs. Control programs also include vaccination to reduce BVD infection rates and biosecurity measures to prevent introduction of BVD PI animals into the herd.

BVD PI detection may be a "needle in the haystack" exercise, so herd screening should be done in a rational, comprehensive manner. Veterinarians and their clients should discuss the best strategy for a particular herd, given producer goals and exposure risk. Keep in mind that good record keeping of animal ID and test results is required. The PI status stays the same throughout an animal's life, so once an animal has a negative test, it does not need to be retested at a later date. Conversely, knowing which animals in the herd have not been tested focuses efforts in future rounds of testing.

One strategy is to test all calves in the spring. Identifying PI calves allows them to be removed from the herd before they expose pregnant cows to the virus.

- Also test all aborted fetuses and stillborn calves. Then test the dams of any positive calf or fetus. A PI cow will have a PI calf, but not all PI calves are born from PI cows. Most PI calves are the result of a transient infection of a dam at the stage of gestation (in the first 4 months) when the fetus is immunotolerant.
- Identify and test the animals in the herd that have not yet been tested, such as open cows, cows that have not calved at the time of herd sampling, or cows that lost their calf and the calf/fetus could not be recovered for testing.
- Any new entries such as replacement heifers or bulls should also be tested before entering the herd.

OTHER TESTS AVAILABLE FOR BVD DIAGNOSIS

As well as skin biopsies, PCR testing can also be done on unfixed tissue samples from aborted fetuses or necropsies, blood or serum, and individual or bulk milk tank samples. EDTA blood is the best sample to detect transient infections in live animals, since the virus can be most reliably detected in the buffy coat cells.

Virus isolation is the traditional method for detecting BVD virus, and can be used with the same samples noted above for PCR testing. However, since additional care is required getting the samples to the lab in a timely manner to ensure virus viability, and isolation may take up to 2 weeks to get results, this test now is used mostly for cases in which further characterization of the virus isolates by genetic analysis is required.

Antibody testing by virus neutralization assay is used to demonstrate exposure to the virus. It may take as long as 4 weeks to develop a significant antibody titre after infection. Testing acute and convalescent serum samples is required to establish that an infection occurred recently. Historically, killed vaccines did not elicit high titres and thus the magnitude of the antibody level could sometimes be used to distinguish vaccination from infection. However, newer modified live vaccines produce higher titres which makes this discrimination more difficult.

Transient infection of the pregnant cow can result in abortion, a PI calf, or congenital abnormalities. While persistent infection results from *in utero* exposure at 30 to 125 days of gestation (period of immune tolerance), virus infection at later stages of gestation can still result in congenital abnormalities. However testing the fetus or calf in these cases does not always demonstrate virus since the developing immune system of the fetus can clear the virus infection. Detection of antibodies in serum from newborn calves collected prior to colostrum ingestion indicates *in utero* infection, and can be used to diagnose the role of BVDV in these cases of congenital abnormalities.

If you have any questions about testing for BVD, please contact:

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Laryngeal Rhabdomyosarcoma in a young Boxer cross dog

By: Moira Kerr, Veterinary Pathologist, PDS

A 3 year-old, spayed female, Boxer cross dog was presented to the Western College of Veterinary Medicine Veterinary Medical Centre (WCVM-VMC) for further investigation of a previously identified laryngeal or tracheal mass. The dog lost the ability to bark twelve months prior to being referred to the WCVM-VMC. On physical examination the dog was BAR but a marked abdominal component was observed with inspiration. The dog was eating and drinking normally without any episodes of vomiting or regurgitation. The dog had experienced respiratory dyspnea with excitement and episodes of tonic-clonic seizures during these episodes. Survey cervical radiographs revealed a poorly circumscribed, large, homogeneous, soft tissue opacity that deviated the larynx and trachea ventrolaterally and to the right. During anesthetic induction for advanced imaging studies (CT and MRI) two large masses could be observed, one tonsillar and one laryngeal. The caliber of the trachea was narrowed and required the placement of a small endotracheal tube. Due to respiratory complications the advanced imaging studies could not be completed. The owner elected euthanasia when informed of the advanced nature of the mass and the need for a temporary or permanent tracheostomy tube. The owner consented to incisional biopsy of the laryngeal mass following euthanasia. Imprint cytology was performed and the biopsy was submitted for histopathologic examination.

The imprints of a biopsy of the laryngeal mass were highly cellular and comprised dense collections of round to polyhedral to spindled cells with distinct cell borders and a moderate to high nuclear to cytoplasmic ratio (see image 1). The nucleus was centric, round to oval with a finely stippled chromatin pattern and a single, large, round nucleolus. The cytoplasm was scant to moderate and amphophilic. There were linear forms of these cell that contained multiple (up to 4 seen) centrally located nuclei and vague perpendicular bands/cross striations (possible Z-bands). Anisokaryosis and anisocytosis were moderate. Mitoses were rare. Macronucleoli and karyomegaly were rare. The cytologic diagnosis was a skeletal muscle tumor—most likely a laryngeal rhabdomyosarcoma given the cytologic findings, degree of pleomorphism and location of the mass. Histochemical stains and immunohistochemistry were used to lend support to the diagnosis of a rhabdomyosarcoma. Staining with phosphotungstic acid-hematoxylin revealed a small minority of tumor cells that contained a dark blue, finely stippled material but did not demonstrate cross-striations (see image 2). Staining with periodic Acid Schiff (PAS), without and with diastase, revealed variably positive cytoplasmic staining with PAS that was sensitive to treatment with diastase. The majority of tumor cells in the mass were positive for desmin intermediate filament expression (see Image 3). Approximately 50% of the tumor cells in were positive for vimentin intermediate filament expression.

The histologic findings in the biopsy from the laryngeal mass coupled with the clinical findings, imprint cytology and histochemical and immunohistochemical stains were most consistent with a laryngeal rhabdomyosarcoma (RMS). RMSs are malignant neoplasms of striated muscles, which originate from muscle progenitor mesenchymal cells or from myocytes undergoing neoplastic transformation (1,2). The majority of RMSs in dogs have occurred in tissues that normally do not contain striated-muscle cells, such as the pharynx, gingiva, urethra, trachea, larynx and the jawbone (1). In veterinary medicine RMSs can be classified into subtypes based on histologic characteristics:

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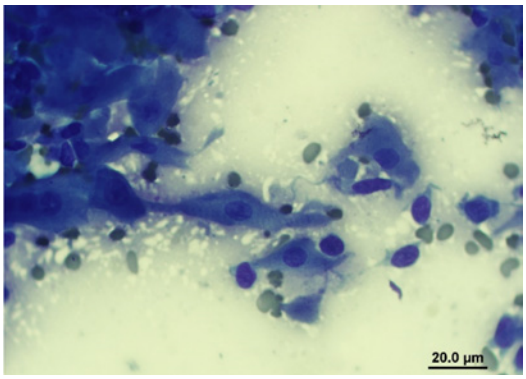

Image 1: Fine needle aspiration cytology showing singleton and close groupings of tumor cells. Some tumor cells have cytoplasmic cross striations. Wright Giemsa stain.

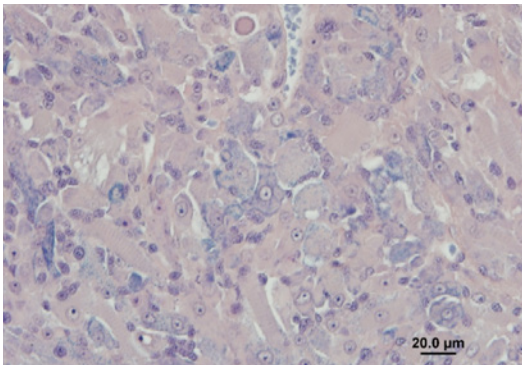

Image 2: Tumor cells showing different patterns of staining with phosphotungstic acid-hematoxylin stain

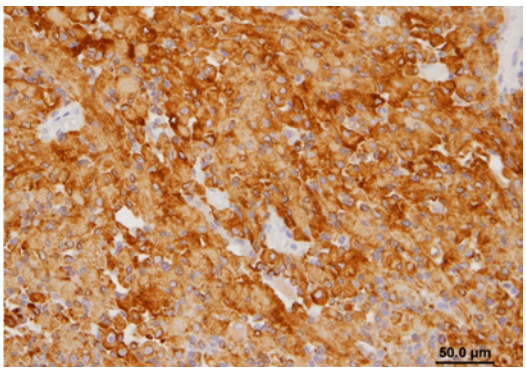

Image 3: Tumor cells exhibiting variable positivity for desmin intermediate filaments.

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embryonal RMS, alveolar RMS, botryoid RMS (aka: botryoid embryonal) and pleomorphic RMS. The clinical relevance of this tumor subtyping has not been established in veterinary medicine (1).The variation in phenotype, age of onset and cellular morphology makes the diagnosis and classification of RMS difficult. The diagnostic features of skeletal muscle differentiation are not always evident on light microscopic examination and immunohistochemistry and ultrastructural examination are often needed to confirm the diagnosis (1).

Canine laryngeal rhabdo-myoma/sarcoma is considered a rare, distinct clinical entity in dogs, being locally invasive but rarely metastatic (1,3). Complete excision is often difficult due to local invasion and recurrence of these tumors often lead to euthanasia. Although most are histologically benign, they may cause death or result in euthanasia due to laryngeal obstruction-- as in this case. Affected dogs typically present with dysphonia, aphonia, stridor, and dyspnea. Due to the limited number of cases, age, sex and site predilection have not been recognized.

Canine laryngeal rhabdomyoma and rhabdomyosarcoma have been diagnosed as laryngeal oncocytoma in the past. Laryngeal rhabdo-myomas/ sarcomas can be distinguished from laryngeal oncocytomas by positive staining for myoglobin and desmin or by the ultrastructural presence of myofibers in addition to intracytoplasmic glycogen (PAS +ve and diastase-sensitive) and numerous mitochondria (1,2).

The use of immunohistochemical stains for desmin, α-actins, myogenin, and MyoD1 and ultrastructural identification of sarcomeric structures can be used to determine if relatively undifferentiated tumors could be RMS.

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Gail Krohn Retires from PDS

Gail Krohn retired from PDS April 20, 2018 after 38 years in the laboratory profession. Gail obtained her diploma in Biological Sciences Technology in 1980 and progressed through various positions in laboratory settings. Gail got her first laboratory technology position as a summer student at the Tisdale Alfalfa Dehy laboratory in 1979. After graduating from Biological Sciences in 1980 she worked as a research technologist at Western College of Veterinary Medicine for Dr. Henry Tabel. In October 1981 she started work as a technologist at Saskatchewan Provincial Health laboratory in the virology. Her love of the veterinary field drew her to the Saskatchewan Provincial Veterinary Laboratory in Regina to work as a technologist in 1986. Once in the veterinary field she progressed her career to head technologist and quality manager at the Regina Laboratory. With the formation of Prairie Diagnostic Services (PDS), Gail continued her work in Regina until 2009 when she started working in Saskatoon. From 2009 until her retirement in April she continued her work as quality and project manager and participated on the leadership team. Gail was a valued member of the PDS teams in Regina and Saskatoon and her dedication, quiet but firm mentorship, knowledge and enthusiasm are greatly missed by everyone who had an opportunity to work closely with her. We wish Gail and her family all the best in this new phase of their lives…as you can see she already has a handle on retirement and how best to enjoy it!

READERS' FEEDBACK

The **Animal Health Perspectives** editorial team (Dr. Moira Kerr, Brian Zwaan 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.