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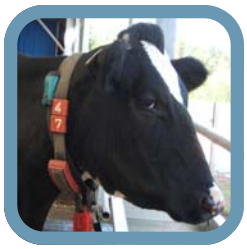

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Veterinary Services Unit—Staffing Update:

Babak Sanei, Lead Veterinarian, Disease Prevention—Poultry, will be returning from his leave of absence on January 19, 2009.

Our thanks to Dr. Agnes Agunos for filling the position during his absence.

Rethinking the Ecology of Disease

Tim Blackwell,
Veterinary Services Unit, OMAFRA

Veterinarians normally view diseases as problems that must be eliminated or controlled. We generally consider the effects of multiple infections to be additive or even multiplicative in terms of the damage they cause to an animal. But can diseases ever work together for the benefit of an animal? Can one infection protect an organism from the damage caused by a second infection?

This appears to be the case in at least one situation where two different non-native insects infest Hemlock trees in North America. Infection with only the woolly adelgid inhibits new growth on Hemlocks by approximately 15% per year, eventually leading to the death of the tree. Infection with only the Hemlock scale insect inhibits growth by about 2% per year and seldom leads to the death of a tree. It would be reasonable to assume that a combined infestation would lead to greater inhibition of growth and a more rapid demise of the tree than either infection alone. This was not the case in an experimental infection reported recently in *Ecology*.

Both insects damage Hemlock trees by sucking tree sap. The woolly adelgid also produces a substance that is toxic to the tree and results in the much greater inhibition of growth compared to the scale insect. Since both insects compete for the same ecological niche (i.e., both drain nutrients from the needles), each restricted the ability of the other to colonize the entire tree. The combined insect infestation restricted tree growth by around 3 to 4% or about twice what the scale insect would have caused alone, but much less than what the woolly adelgid would have done alone. The uninfected controls grew the best but the researchers were surprised to find that a double infection was less damaging than the single infection with the woolly adelgid.

Whether analogies in livestock agriculture exist are unknown. There are reported instances where the same infection in one herd causes

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much less damage to the livestock than the same infection in a separate herd. Some have hypothesized that the differences in severity of the clinical signs between the two herds were due to differences in innate immunity. Perhaps one should also consider the possibility that unseen competition for preferred infection sites could also be responsible for some of these differences in clinical outcomes. Although we all agree that no disease is better than one, in the case of the eastern Hemlock, two diseases can also be better than one.

Figure 1. In a presumed PRRSV-negative herd, a singleton PRRSV ELISA reactor, with accompanying herd mate negative values in the non-zero range, can be indicative of a change in herd status.

PRRSV ELISA Singleton Positive Reactors in PRRSV-Negative Swine Herds

Greg Wideman, Maitland Swine Services
Susy Carman, Animal Health Laboratory
Janet Alsop,Veterinary Services Unit, OMAFRA

A 2400-head, continuous-flow, PRRSV-negative finishing barn that produced replacement gilts was serologically and clinically monitored on a monthly basis. On one routine visit in 2008, one out of ten serum samples tested positive (s/p ratio = 0.487) on the IDEXX PRRSV 2XR antibody ELISA test. The other samples were negative, but six of them had non-zero s/p ratios (0.223, 0.129, 0.054, 0.021, 0.013 and 0.011). There were no clinical signs of PRRSV infection.

Because of the potential for infecting downstream herds, additional tests were performed to confirm the herd status. The ELISA test was re-run twice, again with positive results (s/p ratios of 0.483 and 0.490). The sample was then tested using the PRRSV IgG IFA test for a North American strain of PRRSV (VR-2332). The IFA was negative at the 1:20 dilution. Finally, all ten samples were tested with Tetracore Real-time RT-PCR, in pools of 5. **Both pooled samples were positive for PRRSV.** In the following week, further testing of pigs at the site was carried out. Sixty-nine pigs were tested using Tetracore Real-time RT-PCR in pools of 3. Ten of the pools were positive, confirming that the herd was infected.

The IDEXX PRRSV 2XR antibody ELISA test has a diagnostic sensitivity of 97.4% and a diagnostic specificity of 99.6%, as reported by the manufacturer. However, since this new version of the test was first offered several years ago, it has been recognized that there are more singleton false positive reactors identified than with the older test, despite the high reported specificity.

During routine testing of 10-week old pigs in a PRRSV-negative, batch-flow barn in the period July 2006-September 2008, 17.5% of the batch tests and approximately 1.5% of all of the individual samples (10-12 samples per batch) had a singleton positive reactor, indicating a test specificity on this farm of 98.5%

The serological results from eight PRRSV-negative herds enrolled in the OSHIP program were examined for the period May 2006 – October 2008. Five of the herds had at least one singleton IDEXX PRRSV 2XR antibody ELISA reactor during this period. On individual test dates, the false positive reactors in the five herds ranged from 2.5-5% (sample size ranged from 20-47 animals per group). The reactors in the five herds during the entire period ranged from 0.7-2%. The overall reactor rate for all testing carried out in the eight herds during the period was 0.0064%. The s/p ratios of the eight reactors ranged from 0.409-0.806 and the s/p ratios of the animals classified as negative ranged from 0.000-0.390. The reactors were all confirmed antibody negative by IFA IgG. All of the herds have remained PRRSV negative to date (November 2008).

The test cut-off point for the PRRSV ELISA, set at 0.400 by IDEXX, is designed to minimize false-

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positive results, while maximizing sensitivity. The ELISA is intended to be a herd-based test.

In experimental infections, using the IFA test, IgM antibody can be detected in pigs as early as 5 days post infection (dpi) [1]. IgM antibody peaks at 14 to 21 dpi, and rapidly declines to undetectable levels by 21 to 28 dpi [1]. Experimentally, IgG antibody can be detected in the IFA at 7 to 11 dpi, compared to 9 to 11 days for the ELISA [1]. IFA IgG antibody persists for a relatively shorter time (4-6 months) than antibodies demonstrated by ELISA (4-10 months) [1]. When re-testing the samples from singleton-positive ELISA-reactor animals, practitioners should confer with laboratory diagnosticians to assist them in deciding which IFA test they want to have run (IgM or IgG, or both), and whether they want samples tested using the North American (NA) strain (VR-2332), the South Dakota Euro-like strain or both. To date, all PRRSV strains sequenced at the Animal Health Laboratory have been NA strains.

The PCR test can detect animals that are viremic and have not yet produced detectable antibodies. It is very important to use the clinical history and the ELISA results before making a decision regarding how many samples to pool for PCR testing. If only one animal is positive on ELISA and there are no clinical signs of PRRSV infection, but it is decided to re-test all of the samples, the singleton-positive reactor should be tested individually and the remaining sera should be pooled in groups of no more than 2, because the animals will most likely be at the beginning of infection, with low levels of viremia.

This case demonstrates the importance of sample size and timing when testing populations of animals. Using the herd size and the desired confidence level, sample size can be calculated, or a sample size table can be used (e.g., Win Episcope 2—*www.clive.ed.ac.uk/cliveCatalogueItem.asp?id=B6BC9009-C10F-4393-A22D-48F436516AC4*). It is likely that, if more animals had been tested in the case herd, there would have been additional ELISA-positive animals and the initial test results would have been less equivocal. Confirmation of herd status is not reliable when using inadequate sample size. In this case, if one of the ten samples had not tested positive on ELISA, the herd would have been misclassified as negative and downstream infection would have occurred. In addition, if the herd had been tested several days earlier, the infection may not have been detected because all of the ELISA results would have been negative.

In a presumed PRRSV-negative herd, a singleton PRRSV ELISA reactor, with accompanying herd mate negative values in the non-zero range, can be indicative of a change in herd status. The serum from reactors should be re-tested using IFA to identify the presence of IgM or IgG antibody. In addition, consideration should be given to re-testing with PCR to identify whether the animal is viremic.

1. Collins JE, Dee SA, Halbur PG, et al. Laboratory diagnosis of porcine reproductive and respiratory syndrome (PRRS) virus infection. J Swine Health Prod 1996;4(1):33-35.

A Lying Meter for Dairy Cows

Neil Anderson,
Veterinary Services Unit, OMAFRA

When the new afimilk™ lying meter (Pedometer+™) comes into use in our free-stall dairy barns, we may find that we have been deceiving ourselves about cow comfort. The lying meter could also direct our husbandry practices.

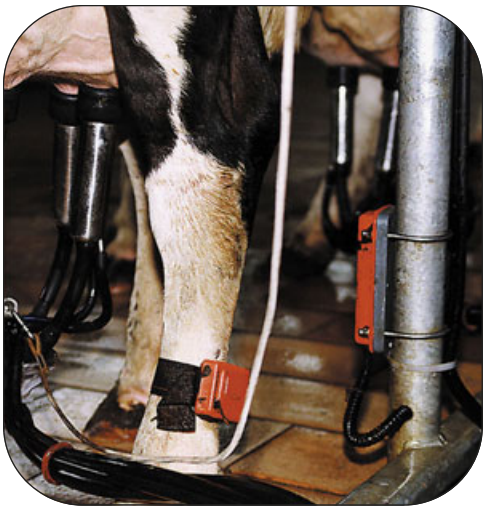

Figure 1. The lying sensor in the new Pedometer+™ gives producers practical technology to record lying times and lying bouts on their farms.

Pedometry is already in common use for detecting cows in estrous. The lying sensor in the new

(Continued on page 5)

Pedometer+™ (**Figure 1**) gives producers practical technology to record lying times and lying bouts on their farms.

Researchers from the University of British Columbia reported relationships between lying times and stall characteristics. Since lying times vary with stocking density, producers may use lying meter data to define the most favourable stocking density in free-stall pens. The data also may show the effects of sand levels within stalls, the amount of sawdust on mattresses, the use of cooling fans, or the introduction of new animals to a pen. Information from reports may guide our choices in bedding management, stocking density or cooling strategies.

According to an afimilk™ representative, research is underway locally at the University of Guelph, in Alberta and at one commercial Canadian dairy farm. A lying meter should remove subjectivity from cow comfort assessments. Instead of believing our cows are resting enough hours, lying meter data will show the time and trends. The afimilk™ lying meter (Pedometer+™) promises to be a useful tool for producers, veterinarians and cows in their care.

To Follow or Not to Follow Label Directions

Neil Anderson, Veterinary Services Unit, OMAFRA

I used to believe in following label directions but I don't anymore with labels on some milk replacers. Labels show directions for use and imply satisfactory results when followed. Unfortunately, milk replacer labels do not show estimated daily gain, the information needed to make feeding decisions.

Daily weight gain or loss will vary with the starting weight of a calf, calf house temperature, nutrient sources in the powder, grams of powder per litre, and volume fed each day. During the first three weeks of a calf's life, milk is its major source of nutrients. Using formulae from the National Research Council 2001 publication on nutrition of calves, I calculated estimated weight gains for two milk replacers shown in **Tables 1 and 2**. No estimates were available from the manufacturer.

Estimated Daily Gain (g) for a 45 kg Holstein Calf Fed by Label Directions in Housing at 10, 0, -10°C and -20°C				
Milk Replacer (22% Prot:17% Fat) 125 g/L	**10°C**	**0°C**	**-10°C**	**-20°C**
Day 5 – 7 3.75 L / day	Loss	Loss	Loss	Loss
Day 8 – 10 4 L / day	185	Loss	Loss	Loss
Day 11– 14 5 L / day	355	230	Loss	Loss

Table 1 shows weight gain or weight loss associated with the mixing and feeding directions for a milk replacer containing 22% protein and 17% fat. A 5-day-old calf kept in housing below 10°C will lose body weight on this feeding schedule.

The feeding guide for the 22:17 milk replacer shown in Table 1 comes from the manufacturer's website. When fed according to instructions, calves would gain poorly or lose weight. From experience, I know the milk replacer produces excellent weight gain and growth in calves when mixed at 150g/L and fed in greater volumes.

The feeding guide from another milk replacer appears in Table 2. On their website, the manufacturer states "It is intended as a low cost alternative for calves over 5 weeks of age." However, there is a feeding guide for younger calves. I discounted the protein analysis to 14% to complete Table 2.

Estimated Daily Gain (g) for a 45 kg Holstein Calf Fed by Label Directions in Housing at 10, 0, -10°C and -20°C				
Milk Replacer (14% Prot from milk sources, 6% Protein from Soy, 14% Fat) 125 g/L	**10°C**	**0°C**	**-10°C**	**-20°C**
Day 5 – 7 3.0 L / day	Loss	Loss	Loss	Loss
Week 2 4 L / day	Loss	Loss	Loss	Loss
Week 3 5 L / day	220	125	Loss	Loss

Table 2 shows weight gain or weight loss associated with the mixing and feeding directions for a milk replacer containing 14% protein from milk sources, 6% protein from Soy and 14% fat. In cool or cold housing, calves would lose body weight on this feeding schedule.

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For both milk replacers, feeding by the label should produce paltry gain or weight loss. Clearly, we should ignore the label and feed for weight gain, preferably about 900g/d. Producers, advisors and calves could benefit from new labels showing estimated weight gain associated with the *directions for use* on a milk replacer label.

Small Ruminant Fecal Analyses- A Summary of the Animal Health Laboratory Data from June 2007 to October 2008

Kathy Zurbrigg and Jocelyn Jansen, Veterinary Services Unit, OMAFRA

Ovine

Over a 16 month period from June 2007- October 2008, there were 85 sheep fecal submissions (one submission may contain multiple fecal samples) for parasite testing. From June-December 2007, there were 22 submissions. From June-October 2008, there were 58 submissions. The total number of samples submitted was 217. The results for Baermann, sucrose and saline wet mounts and fecal floatation tests are presented in **Table 1**.

Result	Percent of Samples with the Listed Result (%)
Eimeria	22.5
Entamoeba	0.2
GIN (includes Hemonchus and Ostertagia)	32.0
Moniezia	5.6
Muellerius	0.2
Nematodirus	12.5
Strongyloides	9.0
Trichuris	8.0
No parasites found	10.0

Table 1 shows the results for the 217 samples submitted from sheep farms.

Caprine

Over the same 16-month period (June 2007- October 2008), there were 53 goat fecal submissions (one submission may contain multiple fecal samples) for parasite testing. From June-December 2007, there were 11 submissions. From June-October 2008, there were 41 submissions. The total number of samples submitted was 76. The results for Baermann, sucrose and saline wet mounts and fecal floatation tests are presented in **Table 2**.

Result	Percent of Samples with the Listed Result (%)
Cryptosporidium	2.0
Eimeria	37.2
Entamoeba	0.6
GIN (includes Hemonchus and Ostertagia)	25.5
Moniezia	2.0
Muellerius	4.0
Nematodirus	1.3
Skrjabinema	2.5
Strongyloides	8.5
Trichuris	2.6
No parasites found	13.7

Table 2 shows the results for the 76 samples submitted from goat farms.

Discussion

In Ontario, small ruminants frequently experience problems and clinical signs associated with parasites in the summer months. This reflects the environmental factors (heat and moisture) needed for parasites to build up on pastures after the winter. Sample submission supports this trend as the greatest number of samples were submitted from June-September for both sheep and goats.

Submission data on age, the number of sick animals, history or clinical signs were frequently not included with the samples.

The number of farms submitting fecal samples increased significantly from 2007 to 2008 for both species. This may be due to the recent growth of the small ruminant industry, increased interest by producers in working with veterinarians, climatic changes that are favourable to parasite production or a combination of all of these factors.

Hemonchosis in Small Ruminants

Extracted from AHL Newsletter— December, 2008
Maria Spinato, Janet Shapiro, Brian Binnington, Murray Hazlett, Andrew Peregrine, Animal Health Laboratory

The AHL reported an increased number of necropsy submissions related to hemonchosis in sheep and goats during the summer of 2008. Twenty-four cases, some with several affected animals, were diagnosed this year compared to only 8 cases in 2007. Clinical signs reported by producers included weakness, weight loss, diarrhea and sudden death. Gross findings at necropsy typically consisted of emaciation, severe anemia, peritoneal and pleural effusion, and subcutaneous edema that was especially prominent in the intermandibular region ("bottle jaw"). Masses of thread-like "barber-pole" nematodes approximately 1.5 cm in length were present within the red-tinged to melenic fluid content of the abomasum, consistent with *Haemonchus contortus*.

There are several factors implicated in the increased losses due to gastrointestinal parasitism this year. The wet summer weather in Ontario provided ideal conditions for prolonged survival of L3 larvae on pasture, compared to the much drier conditions in 2007, and likely was the major contributing factor. Additionally, returning de-wormed sheep to heavily contaminated pastures was seen as a significant factor in re-infection and prolongation of the disease in flocks. However, **multidrug-anthelmintic resistance is also an increasing problem**, reported globally as a cause of significant morbidity and mortality, occasionally resulting in flock culls. Resistance of *Haemonchus sp.* to both ivermectin and albendazole has recently been described on a farm in Ontario, and anecdotally, such resistance appears to be a problem on many farms. Animals from 16 of the affected farms in Ontario this year had been de-wormed with ivermectin or a benzimidazole product, and 3 producers had used both classes of anthelmintics to treat their flocks. Levamisole is a third drug that can be used in cases of suspected anthelmintic resistance. However, it must be compounded by request, as a commercial product is not available in Canada.

Two new classes of anthelmintics offer some hope that additional products will soon be available to manage drug-resistant nematodes: the cyclodepsipeptides, currently formulated for use only in cats, and the amino-acetonitrile derivatives, still in discovery phase. Until these new drugs are licensed for use in small ruminants, **control measures combining pasture management and an effective de-worming program are critical in preventing death losses due to hemonchosis**. **Practitioners and producers are advised to monitor for the efficacy of anthelmintic therapy by performing a fecal egg count reduction test each year in July/August**, as described in the September 2006 AHL Newsletter. *AHL*

Glauser J, et al. Multiple anthelmintic resistance in an Ontario sheep flock. 22nd Ann Gen Mtg, Ont Sheep Marketing Agency, October 26-27, 2007, Guelph, Ontario (poster).

Kaminsky R., et al. A new class of anthelmintics effective against drug-resistant nematodes. Nature 2008;452:176-181.

Menzies P, Peregrine A. Anthelmintic resistance on the rise in sheep parasites? AHL Newsletter 2006;9:22.

Small Ruminant Veterinarians of Ontario

Rex Crawford, Dufferin Veterinary Services

Announcing a New Organization!

Small Ruminant Veterinarians of Ontario (SRVO)

Small ruminant veterinarians across Ontario are pleased to announce the formation of a new organization: Small Ruminant Veterinarians of Ontario (SRVO). Formed November 19, 2008, in Guelph, Ontario, the group hopes to obtain membership of approximately 70 practicing veterinarians who work with sheep, goats, camelids and cervids.

The objectives of SRVO are to:

- provide members with continuing education in the production practices, health and welfare of small ruminants.
- speak as a unified voice for small ruminant veterinarians to government, industry and producers on topics concerning the continued health and welfare of our patients.

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- promote and encourage veterinary students and new graduates to take an active interest in small ruminant medicine.

Details about joining SRVO will be forthcoming over the next few weeks. Planning is currently underway for our first continuing education meeting in mid February 2009.

For further information contact Rex Crawford (President) or Jocelyn Jansen (Secretary/Treasurer).

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Increased Testing for Inhibitors in Dairy Goat Milk—Warning re: Anthelmintic Withdrawal Times

Karen Atchison, Manager, Dairy Food Safety Program and Jocelyn Jansen, Veterinary Services Unit

The safety and quality of raw milk is monitored by the Dairy Food Safety Program, Food Inspection Branch, OMAFRA. Samples taken from goat milk bulk tanks are tested on a regular basis for bacterial content, somatic cell content, freezing point and for the presence of inhibitors. Under the *Milk Act* the program may also conduct tests in order to detect foreign substances in milk.

Veterinarians with dairy goat clients should be advised that the Dairy Food Safety Program has been **testing for a wider range of inhibitors** in bulk-tank milk samples. The program has expanded this testing to ensure that Ontario consumers continue to have a safe and wholesome milk supply. Anthelmintic drugs now being tested for include the avermectins and moxidectin. Producers were notified in writing in June 2008 that increased testing would begin in September of 2008.

In the event of a positive test result for inhibitors on a bulk-tank sample of milk, follow-up regulatory action could include orders to dispose of contaminated milk and suspension of marketing privileges until regulatory test results on the bulk-tank milk are negative for inhibitors.

There are no licensed anthelmintic products for use in dairy goats. **Products typically used on dairy cattle frequently require longer withdrawal times when used on dairy goats due to different routes of administration and changes to the dosages.** A cattle pour on product with a zero milk withdrawal, will not have a zero milk withdrawal when given orally and/or when the dose is increased. Moxidectin in particular has been shown to have greater persistence in milk once absorbed systemically due to its lipophilic nature [1,2]. In Canada, if no maximum residue limit (MRL) has been established for a product in milk, then any amount detected in milk constitutes a residue violation [3,4]. The following drugs have a zero tolerance level for residues in milk: moxidectin, ivermectin and doramectin. Eprinomectin has a MRL of 0.02 ppm in milk.

Veterinarians should contact the Canadian gFARAD to obtain science-based withdrawal interval recommendations for extra-label drug use [5]. **Veterinarians may submit web requests at any time.** Most questions can be answered rapidly; however, responses may require several weeks, as global databases are searched for information. Veterinarians are reminded that the withdrawal intervals recommended by gFARAD are for use within a valid veterinary-client-patient relationship and that the prescribing veterinarian is ultimately responsible for potential residues resulting from the extra-label use.

If you have any questions or concerns regarding the Dairy Food Safety Testing Program, please contact

(Continued on page 9)

Karen Atchison at (519) 826-4378. For all other comments or concerns, contact Jocelyn Jansen at (519) 846-3414.

1. *Imperiale F, Lifschitz A, Sallovitz J, Virkel G, Lanusse C. Comparative depletion of ivermectin and moxidectin milk residues in dairy sheep after oral and subcutaneous administration. J Dairy Res 2004; 71(4):427-433.*
2. *Baynes RE, Payne M, Martin-Jimenez T, Abdullah A-R, Anderson KL, Webb AI, Craigmill A, Riviere JE. Extralabel use of ivermectin and moxidectin in food animals. JAVMA 2000; 217(5):668-671.*
3. *Food and Drugs Act, Government of Canada: http://laws.justice.gc.ca/en/showtdm/cs/F-27*
4. *Chicoine AL, Durden DA, MacNaughton G, Dowling PM. Ivermectin use and resulting milk residues on 4 Canadian dairy herds. CVJ 2007; 48(8):836-838.*
5. *Canadian gFARAD: www.cgfarad.usask.ca/*

Disease Alert for the Poultry Industry- Infectious Laryngotracheitis (ILT)

Adapted from an OMAFRA factsheet written by Paul Innes—Veterinary Science and Policy Unit

Clinical cases of ILT have recently been confirmed in central Quebec, in the Trois-Rivieres area. Quebec veterinarians dealing with the affected flocks indicate that this is a severe strain of ILT with greater mortality and more severe clinical signs. There is a substantial amount of poultry movement between Quebec and Ontario; therefore veterinarians, producers and bird owners in Ontario should be vigilant for signs of disease. Service industries and provincially and federally licensed processing plants have been advised to enhance their biosecurity procedures.

ILT is an acute respiratory disease caused by a herpes virus that can lead to devastating losses in the broiler and layer industries. The mortality rate of ILT is usually low, but can occasionally affect more than 20% of the flock. Persistant shedding from recovered birds can prolong infection within the flock for long time periods. Clinical signs include gasping, neck and wing extension, watery eyes, and persistant nasal discharge. In severe cases, coughing and blood in the trachea may be observed.

The disease is mostly frequently associated with chickens but can also affect pheasants and peafowl. Ontario has experienced cases of ILT in the past. In 2007, clinical cases were confirmed in Norfolk and Lanark counties.

ILT spreads slowly through a flock over 2-4 weeks. The disease spreads by contact with an infected bird or by contaminated clothing, vehicles or equipment from an infected farm. Good biosecurity practices are the most important means of prevention of ILT. Producers should consult with their veterinarian to determine the appropriate biosecurity measures for their operation.

California's Proposition 2

Adapted from an article by A. Guy, written for Livestock Welfare Insights, Alberta Farm Animal Care (AFAC)

On November 4, 2008, Californians voted yes on Proposition 2 with a margin of 63% to 37%. This ballot measure adds a chapter to the California Health and Safety Code and requires that egg-laying hens, pregnant pigs, and calves raised for veal be confined only in ways that allow these animals to lie down, stand up, fully extend their limbs and turn around freely.

Exceptions to this law are made for transportation, rodeos, fairs, 4-H programs, lawful slaughter, research and veterinary purposes. People found in violation of this law will be charged with misdemeanour penalties, including a fine of up to $1,000 and/or imprisonment in jail for up to 180 days. The statute will come into effect on January 1, 2015.

California is the 5th largest egg producer in the United States with over 19 million laying hens. The state produces much less pork, ranking 27th in the US, and even less veal. Proposition 2 will therefore have the largest impact on egg producers. In fact, according to a study by the University of California at Davis, passing Proposition 2 would lead to the demise of the egg industry in California. It is no surprise that Proposition 2 was heavily opposed by

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the United Egg Producers and Pacific Egg & Poultry Association. Over $7.5 million was spent to convince voters that Proposition 2 would compromise food safety and increase egg imports from Mexico. This was just shy of the $8 million spent on the Yes campaign.

The success of Proposition 2 was celebrated by co-sponsors, the Humane Society of the United States (HSUS) and Farm Sanctuary. Supporters are optimistic that Proposition 2 will not only improve animal welfare in the state of California, but will cause a ripple of similar legislative changes in other states.

It is unclear which housing practices will be acceptable under Proposition 2. The wording of the ballot measure is ambiguous as it only states which behaviours the animals must be able to perform and does not provide a numerical value as to the amount of space each animal must be allotted. The UC Davis report speculates that up to 2.8 ft^2 of space may be required for each hen.

Many farmers are going to wait for the regulators to interpret the law before making any changes to their operations. Others may be considering their exit strategies. Farmers unwilling or unable to refit their facilities to comply with Proposition 2 will either move to another state or close their doors. Before Proposition 2 was passed, California was already importing one third of its shelled eggs. Out-of-state producers that still use cages will undoubtedly capitalize on the market opportunities in California and increase production to compensate for a lack of local eggs. Therefore, although Proposition 2 was originally intended to improve the welfare of laying hens, it may ultimately not be doing so across the entire United States.

1. *California Secretary of State (2008) Proposition 2: Standards for confining farm animals. Prepared by the Attorney General. www.voterguide.sos.ca.gov/title-sum/prop2-title-sum.htm.*
2. *United States Department of Agriculture, National Agricultural Statistics Service. (2008)*
3. *Sumner, DA, et al. (2008) Economic Effects of Proposed Restrictions on Egg-laying Hen Housing in California. http://aic.ucdavis.edu/publications/eggs/executivesummaryeggs.pdf*
4. *California Secretary of State. http://cal-access.sos.ca.gov/Campaign/Committees/Detail.aspx?id=1301462&session=2007*

It is hypothesized that similar ballot measures will surface in the future. Proposition 2 is the 4th state law to change confinement measures for farm animals. Four other states: Florida, Arizona, Oregon and Colorado, have already outlawed the use of gestation crates and both Arizona and Colorado have also banned veal crates. Proposition 2 is the first law in the US to include a ban on cages for laying hens. The HSUS was also behind the Florida and Arizona initiatives and it is hypothesized that they will continue with similar measures state by state.

BSE Case Confirmed in British Columbia

Adapted from a Canadian Food Inspection Agency Notice, CFIA Website www.inspection.gc.ca/

The Canadian Food Inspection Agency (CFIA) has confirmed bovine spongiform encephalopathy (BSE) in a seven-year-old dairy cow from British Columbia. No part of the animal's carcass entered the human food or animal feed systems. This is Canada's 15th positive case.

The animal's birth farm has been identified, and an investigation is underway. The CFIA is tracing the animal's herdmates at the time of birth and examining possible sources of infection. The age and location of the infected animal are consistent with previous cases detected in Canada.

This case was detected through the national BSE surveillance program, which has been highly successful in demonstrating the low level of BSE in Canada. The program continues to play an important role in Canada's strategy to manage BSE.

Canada remains classified as a Controlled Risk country for BSE by the World Organisation for Animal Health (OIE). Accordingly, this case should not affect exports of Canadian cattle or beef.

Transmissible Spongiform Encephalopathies of Animals

Keren Mack and Ab Rehmtulla, Veterinary Inspection and Audit

TSEs are progressive neurodegenerative disorders affecting several mammalian species: Bovine Spongiform Encephalopathy (BSE) in cattle, variant Creutzfeldt-Jakob Disease (vCJD) in humans, Scrapie in sheep and goats, and Chronic Wasting Disease (CWD) in deer and elk. This article provides a review of the basic epidemiology and clinical signs of these diseases and an update on surveillance and control measures.

BSE or "Mad Cow Disease"

There is no test to diagnose BSE in live cattle. Some symptoms of this disease in cattle are nervousness, teeth grinding and weight loss. BSE is transmitted through the consumption of contaminated feed (i.e. feeding mammalian-derived proteins to cattle through established rendering practices). This disease is not infectious in that it does not spread from one animal to another.

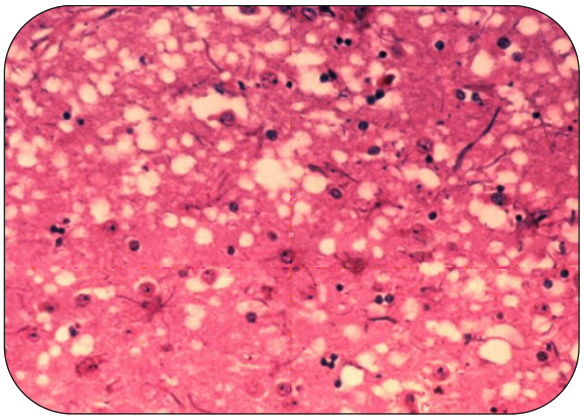

Figure 1. The presence of vacuoles (i.e. microscopic "holes" in the gray matter) gives the brain of BSE-affected cows a sponge-like appearance when tissue sections are examined in the laboratory.

BSE is a non-contagious but zoonotic disease (i.e., it can be transmitted to humans). Variant Creutzfeldt-Jakob Disease (vCJD) is a rare human disease that affects the central nervous system and can be caused by the consumption of BSE-contaminated meat products. The risk of contracting vCJD in Canada is extremely small.

In 1990, the Canadian Food Inspection Agency (CFIA) implemented stringent surveillance guidelines to limit the risks to human and animal health. Removal of Specified Risk Materials (SRM) protects against BSE transmission risk posed by cattle that have been exposed but are not showing symptoms of the disease. The incubation period for BSE is greater than four years.

SRM includes the skull, brain, spinal cord, dorsal root ganglia (nerves attached to the spinal cord), distal ileum, trigeminal ganglia (nerves attached to the brain), retina and tonsils. Additionally, SRM is banned for use in feed, pet food and fertilizers. Use, sale or import of beef products containing SRM from countries that are not BSE-free is therefore strictly prohibited. This measure is internationally recognized as the most effective way to protect human health from BSE.

Chronic Wasting Disease (CWD)

CWD is a contagious fatal disease that affects deer and elk. Although CWD is endemic to Colorado and Southern Wyoming, it has been identified in free-ranging cervids in Nebraska, New York, New Mexico, Illinois, Utah, Wisconsin, Alberta and Saskatchewan. Due to limited surveillance efforts, the actual geographic spread of CWD is unknown.

CWD is infectious and transmitted to other cervids through feces, contaminated environments and saliva. Currently, there is no scientific evidence to show that CWD poses a risk for humans. Some symptoms of CWD in cervids are: weight loss, decreased interactions with other animals, excessive salivation, drinking and urination. As there is no practical live-animal test, the only conclusive diagnosis involves examination of the brain, tonsils or lymph nodes after death.

Ongoing provincial surveillance programs require fatalities in deer and elk to be sent to provincial laboratories for post-mortem screening. The CFIA has specific measures in place designed for producers wanting to import elk.

(Continued on page 12)

Scrapie

Scrapie is the most global TSE disease, having inflicted thousands of sheep throughout the world, excluding New Zealand and Australia. Scrapie is predominantly found in sheep and goats. It is transmitted from ewe (female sheep) to offspring and other lambs via contact with the placenta and its fluids. Males can become infected with Scrapie but they do not transmit the disease to other animals.

Symptoms are: unexplained weight loss, erratic behaviour and problems standing or walking. Because of the long incubation period, clinical symptoms usually arise between two and five years of age, while death occurs within one to six months following the onset of the symptoms.

As of October 2008, the CFIA implemented a Scrapie Surveillance Program to detect Scrapie in the national sheep flock and goat herd. Currently, samples from mature sheep at provincially-inspected abattoirs are sent to the Animal Health Laboratory for testing. The objective of this extensive program is to identify infected flocks so that necessary steps can be taken to completely eradicate the disease from Canada.

	BSE	vCJD	CWD	Scrapie
Species	Cattle	Humans	Deer Elk	Sheep Goat
Transmission	Ingestion of contaminated feed	Consumption of BSE-contaminated meat	Feces, contaminated environments, saliva	Placenta and fluids
Incubation	4-5 years	10-15 years	1-3 years	2-5 years
Symptoms	Nervous, reluctant to enter doorways, teeth grinding, frenzy, excessive licking, weight loss, low milk	Depression, anxiety, pain in limbs, face, body, at 6 months slurred speech, memory loss	Weight loss, increased drinking, salivation and urination, decreased interactions with other animals	Nervousness, aggressive, solitary, problems standing and walking, pruritus
Organs accumulating prion proteins	Brain, spinal cord, eyes, tonsils, trigeminal ganglia, dorsal root ganglion, distal ileum of the small intestine	Brain, pituitary, spinal cord, eyes, tonsils, lymph nodes, spleen	Brain, pituitary, spinal cord, eyes, tonsils, lymph, spleen, pancreas, peripheral nerves	Brain, spinal cord, spleen, lymph nodes, placenta, large and small intestines, blood, pancreas, ovary, liver, muscle

Table 1 summarizes salient features of Spongiform Encephalopathies.

Continuing Education/Coming Events

Dairy Housing Seminars

Free Stall Housing Design Seminar

February 10 & 11, 2009 Arden Park Hotel, Stratford, Ontario.
March 4 & 5, 2009 Purvis Hall, Kemptville College of Agricultural Technology, Kemptville, Ontario.

Tie Stall Housing Design Seminar

February 18, 2009 Linwood Community Centre, Linwood, Ontario
March 3, 2009 Purvis Hall, Kemptville College of Agricultural Technology, Kemptville, Ontario

For further information, please refer to *www.omafra.gov.on.ca/english/livestock/dairy/facts/info_freetiestall.pdf*

Continuing Education/Coming Events (continued)

January 9, 2009	Conference on Reproduction, Calving, and Calf-Care in Cow-Calf Herds, Mosier Hall, College of Veterinary Medicine, Kansas State University, Manhattan, Kansas. *www.vet.ksu.edu/CE/2009/heifer.htm*
January 15-17, 2009	18th Annual Western Canadian Association of Bovine Practitioners Conference, Sheraton Cavalier, Saskatoon, Saskatchewan. *www.wcabp.com*
January 25-28, 2009	NMC 48th Annual Meeting, The Westin Hotel, Charlotte, North Carolina. *nmconline.org/annualmeet/2009/*
January 29-31, 2009	Ontario Veterinary Medical Association Conference and Trade Show, Westin Harbour Castle, Toronto, Ontario. *www.ovma.org/upcoming_events/conference.html*
March 10-13, 2009	27th Western Canadian Dairy Seminar—Forging Ahead through Challenging Times, Capri Centre, Red Deer, Alberta. *www.wcds.afns.ualberta.ca/*
May 31-June 4, 2009	VIIIth International Conference on Pig Reproduction, Banff Centre, Banff, Alberta. *www.icpr2009.com*
June 3-6, 2009	2009 ACVIM Forum & Canadian Veterinary Medical Association Convention, Palais des Congrès de Montréal, Montreal, Quebec. *www.acvimforum.org*
July 6-10, 2009	43rd Congress of the International Society for Applied Ethology, Cairns Convention Centre, Cairns, Australia. *www.isae2009.com/*
September 20-24, 2009	International Dairy Federation World Dairy Summit, Maritim Hotel Berlin, Berlin, Germany. *www.wds2009.com*
November 14-18, 2010	26th Congress of the World Association for Buiatrics, Santiago de Chile, Chile. *www.buiatrics.com*

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