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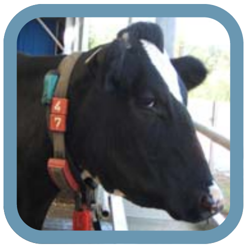

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Ministry of Agriculture, Food and Rural Affairs

Ontario

Bluetongue is No Longer a Reportable Disease in Canada

The Canadian Food Inspection Agency (CFIA) has amended the *Reportable Diseases Regulations* and the *Health of Animals Regulations* to change the status of five types of Bluetongue, from "federally reportable" to "immediately notifiable." Bluetongue types 2, 10, 11, 13 and 17—all of which are considered endemic in the United States—are now listed as immediately notifiable diseases in Canada. The change in disease status reflects the highly integrated nature of the Canadian and American livestock markets. All remaining types of Bluetongue that are exotic to the U.S. are still listed as federally reportable diseases for Canada.

Source: *www.inspection.gc.ca/english/corpaffr/newcom/2010/20100512e.shtml*

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Scrapie Update

Jocelyn Jansen, Veterinary Science and Policy Unit, OMAFRA, and Anco Farenhorst, Animal Health Programs, Canadian Food Inspection Agency (CFIA)

Scrapie continues to be detected at low levels in Canadian sheep. The level of scrapie in goats is unknown, and determining this level has been hampered by the lack of a national goat identification program. The United States (US) has spent millions of dollars to eradicate scrapie from the national flock and has declared that their country will be scrapie free by 2017. The continued presence of scrapie in Canada is preventing our gaining access to international markets, including the US. Equivalence with US disease-control measures, which are taken when a positive case is identified, and national surveillance, will help to re-establish these markets.

Classical scrapie is seen only in adult animals, generally between two and five years of age. In some animals, the disease may take up to eight years to develop. Once an animal exhibits clinical signs, it will die within one to two months. Signs can vary greatly and may include behavioural changes, such as apprehension or aggression, tremors, incoordination or an abnormal gait. However, a mature animal with a poor coat, an animal with unexplained weight loss or one that is simply found dead can also be diagnosed with scrapie. In North America, wasting and weakness

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are the most common clinical signs, while pruritis is the most prominent sign in European cases.

Non-classical scrapie, also known as atypical scrapie, can also occur in both sheep and goats. It is clinically, pathologically, biochemically and epidemiologically different from classical scrapie. It was first identified in Norway in 1998. Atypical scrapie affects sheep with genotypes different from those that develop classical scrapie. This supports the theory that it is a spontaneous (sporadic, non-contagious) condition of older sheep. The majority of atypical scrapie cases have been detected in apparently normal sheep sampled at slaughter. On trace-back, few flocks have had more than one case of atypical scrapie detected in them. Epidemiological data on goat cases is sparse. Atypical scrapie has been found in animals originating from countries that are considered free of classical scrapie, such as Australia and New Zealand. These findings have not affected their status as scrapie-free.

Table 1 lists the number of flocks confirmed with at least one case of scrapie (classical and non-classical), by province/region since 2000. Scrapie was last diagnosed in a goat in 1976.

Table 1. Annual Scrapie Flock Incidence: 2000—2010. (Source: CFIA)

	BC	AB	SK	MB	ON	QC	Atlantic Provinces	Total Canada
2010 ♦	0	1	1*	0	2 (1*)	2	0	6 (2*) ♦
2009	0	1*	1*	0	2*	2	0	6 (4*)
2008	0	0	0	0	2	3	1	6
2007	0	0	1*	0	1	0	0	2 (1*)
2006	0	0	0	1	1	0	0	2
2005	0	0	0	2	0	2	0	4
2004	0	0	0	0	0	1	0	1
2003	0	1	6	0	1	4	0	12
2002	0	0	0	0	0	4	0	4
2001	0	0	0	8	0	4	0	12
2000	0	0	0	3	0	8	0	11
Total	0	3 (1*)	9 (3*)	14	9 (3*)	30	1	66 (7*)

♦ As of May 2010
* Non-classical (atypical) scrapie

The CFIA and several provincial ministries have initiated a surveillance program to detect scrapie in the national sheep flock and goat herd. The goal is to identify every infected animal so that proper steps can be taken to completely eradicate the disease from Canada. However, surveillance numbers for Ontario are below provincial targets. CFIA reminds veterinarians that scrapie should be included as a differential diagnosis in sheep and goats aged 12 months of age and older that die on farm or exhibit unexplained weight loss, changes in behaviour, and/or problems standing or walking. Obex samples can be sent to the Animal Health Laboratory in Guelph for testing. Alternatively, your local CFIA office can be contacted and arrangements made to have a sample taken for testing. There is no charge for samples submitted through the CFIA.

Scrapie is a reportable disease under the *Health of Animals Act*. Animals suspected of having scrapie and ordered destroyed by CFIA are eligible for compensation. In the case of a confirmed positive test result for classical scrapie, the premises of origin are declared to be infected premises and a quarantine is placed on sheep and goats that have been exposed to scrapie. Depending on the management of the flock/herd, quarantines may affect all sheep and

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goats on farms of origin and farms where infected females have recently lambed or kidded. An epidemiological survey is completed and animals which have entered the flock (trace-ins) or have left the flock (trace-outs) during the previous five years are identified. Disease control measures and testing are conducted on each of these premises. All sheep and goats aged 12 months and younger that may have been exposed to an infected birthing environment are ordered destroyed. Meat from these animals may enter the marketplace. According to Health Canada, there is no known risk to public health associated with scrapie. Exposed adult sheep are blood tested and their genotype determined. All high-risk animals, ARQ/ARQ (codons 136, 154, 171/136, 154, 171), are ordered destroyed. If there are no additional test-positive results from this group, no other adult animals are ordered destroyed on the farm. In goats, no genetic profiles that consistently predict a high risk for developing scrapie have been identified. Therefore, all adult goats on the farm are ordered destroyed.

Actions will be taken on a case-by-case basis when atypical scrapie is diagnosed from a sheep or goat. Usually there is only a single isolated case found on the farm and generally no further disease-control measures are deemed to be necessary.

In February of this year, Agriculture and Agri-Food Canada approved funding for a National TSE Eradication Plan. A total of $4.5 million was allocated for a three-year study that will help to determine the prevalence of scrapie in the Canadian sheep flock and goat herd and the continuation of the Voluntary Scrapie Flock Certification Program. Details of the program are still being developed.

Benestad SL, Arsac J-N, Goldmann W, Nöremark MN. Atypical scrapie: Properties of the agent, genetics, and epidemiology. Veterinary Research 2008; 39:19-33.

CFIA Scrapie Factsheet. www.inspection.gc.ca/english/anima/disemala/scrtre/scrtrefse.shtml

CFIA Scrapie Manual of Procedures. www.inspection.gc.ca/english/anima/heasan/man/scrtre/scrtree.shtml

Surveillance for *Staphyloccocus aureus* Exposure Using PCR on DHI Test-day Milk Samples

Ann Godkin, Veterinary Science and Policy Unit, OMAFRA

Eleven herds with historical *Staphylococcus aureus* (*SA*) mastitis problems were enrolled by their veterinarians in a pilot project to investigate the utility of a program for testing first-lactation cows in early lactation using CanWest DHI's Mastitis 3 PCR test. CanWest DHI Customer Service Representatives submitted samples from all first-lactation cows for *SA* testing on each of their first three DHI test dates post calving. The project ran from June 2009 to May 2010.

Results:

During the project, 428 tests were run on 167 heifers. Two thirds of all heifers completed all three tests. Among herds, 40 to 90% of heifers completed all three tests by the time they were removed or the project ended.

Of the 428 tests, 369 (87.9%) were negative, 48 (11.4%) had a "+" result and 3 (0.7%) had a "++" result. Of the 167 heifers tested at least once, 39 (23.4%) were positive at least once, while 28 (71.8%), 11 (28.2%) and 1 (2.6%) of the 39 were positive on one, two or three tests respectively. The results for each of the 11 herds are given in **Table 1**.

In two of the 11 herds, none of the first-lactation cows tested positive. These two herds tested 12 cows and 18 cows respectively, with over 80% of the cows completing all three tests. Among the other nine herds, 5 to 100% of first-lactation cows had at least one positive test. In one herd, all six of their first-lactation cows tested positive.

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Table 1. Results of Mastitis 3 PCR Tests on First Three Test Days for Heifers in 11 Herds.

Herd number	Number of tests run	Number of heifers tested at least once	Heifers with at least 1 of the 3 tests positive		Number of heifers with positive first tests	Of positive heifers, those with more than 1 positive test		Percent of heifers completing all 3 tests
			No.	Percent	No.	No.	Percent	
A	53	19	5	26.3	0	2	40.0	84.2
B	67	29	10	34.5	5	4	40.0	51.7
C	25	10	1	10.0	0	0	0.0	60.0
D	25	12	1	8.3	1	0	0.0	41.7
E	46	18	1	5.6	1	1	100.0	55.6
F	38	18	6	33.3	4	0	0.0	38.9
G	44	16	5	31.3	4	0	0.0	81.3
H	17	6	6	100.0	4	1	33.3	66.7
J	35	12	0	0.0	0	0	0.0	83.3
K	53	18	0	0.0	0	0	0.0	88.9
L	25	9	4	44.4	1	2	50.0	88.9
Total	428	167	39	Avg. 23.4	20	11		
Range	17 to 67	6 to 20	0 to 10	0 to 100%		0 to 4	0 to 100%	38.9 to 88.9%

Table 2. Distribution of Positive Test Results Among First, Second and Third Tests for 39 Positive Heifers.

	StaphID PCR result		
Test day post-partum	Negative	Positive (+ and ++ combined)	Total tests
1st	20 (51%)	19 (49%)	39
2nd	13 (37%)	22 (63%)	35
3rd	12 (55%)	10 (45%)	22
Total	45 (47%)	51 (53%)	96

In the 39 first-lactation cows with at least one positive test, there were 51 positive results out of 96 tests (not all cows had three tests). The distribution of the positive results among the three post-partum test days is shown in **Table 2**. Approximately half of these 39 cows were positive on their first test post-partum. The timing of first tests ranged from 5 to 65 days post-calving. The timing of positive first tests averaged 19 days post-partum (range of 5 to 57 days) and was not different from that of negative tests (average of 21 days, range of 5 to 65 days). Although a high percentage of first lactation cows had positive first tests, these tests frequently occurred after several weeks of milking.

What questions can we answer with a testing program like this?

In herds with ongoing issues with *SA* mastitis, cows in first lactation may become infected at two points in time, either prior to calving as a result of pre-partum exposure or post-partum during milking time. It would be useful to know the importance of each time as a source of *SA* for heifers to improve on-farm controls.

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It would be expected that, if heifers were already infected at calving time, there would be a high prevalence of first test days with positive results. In the nine herds with at least one test-positive heifer, four had multiple heifers that were already positive by their first test. While positive tests on first test day indicate very early exposure, this does not necessarily mean that heifers calved with pre-partum infection. These herds might benefit from additional testing closer to calving time with either the PCR or bacteriological culture to assess infection status at calving and before heifers are exposed to *SA* by milking. A high prevalence or an increase in positive first tests should lead to further investigation to try to separate pre-partum, calving time and post-partum routes of *SA* exposure and to identify key preventive strategies.

In five of the herds, few heifers had positive first tests but had positive tests as lactation progressed. This suggests they were exposed to *SA* at milking time. A close evaluation of milking procedures, assessed with a milking time visit, would be warranted. Post-milking teat dipping (PMTD) with a licensed product is well documented as the most effective method of preventing the spread of *SA* at milking time. In spite of the use of PMTD, problems with *SA* mastitis persist in many herds. Early lactation testing of first-lactation animals, who are initially uninfected and whose udder health status is not affected by prior lactations, may be a method for assessing the degree of exposure of udders to *SA* at milking time. Detection of *SA* DNA in milk samples suggests that the spread of *SA* is continuing and that milking procedures, especially PMTD, are not being performed adequately.

Routine testing of a subset of the herd on a regular basis via the DHI test days, as was done in this project, serves as an ongoing reminder to producers that there is a need to utilize effective milking hygiene procedures consistently to prevent *SA* spread. Attention to detail and, in particular, proper application of PMTD, are key requirements for preventing *SA* mastitis. Further investigation is needed to identify the factors that influence the pre-partum infection prevalence of heifers in herds with *SA* by first test day.

Changes to DFO's Udder Health Management Program

Ann Godkin, Veterinary Science and Policy Unit, OMAFRA

As many of you may already be aware, Dairy Farmers of Ontario (DFO) has discontinued the Udder Health Management (UHM) Program as of January 18, 2010. The plan now is to privatize the service using independent consultants for udder health services. Guy Seguin continues on with DFO as a Field Service Representative in Eastern Ontario while Mark McDougall has left DFO and will seek other opportunities in a similar field. Mark reports that he has thoroughly enjoyed his 28 years with DFO, but will be glad to have a chance to see his sons play soccer in the evenings occasionally. DFO has been supportive of the UHM program. DFO and Mark will continue to work together, although in different ways, in the future.

Mark has enjoyed working closely with veterinary practitioners, Ontario Veterinary College, OMAFRA, milking equipment dealers, nutritionists, sanitation companies, electricians and numerous other industry groups, and we veterinarians have greatly appreciated his efforts as well. Our ability to call on third-party experts, such as Mark and Guy, has been a great resource for us to use when our dairy clients have had milk quality problems. The team effort involving a broad range of industry people working together continues to be a major asset to improving Ontario's raw milk quality.

Mark— good luck and best wishes, as you move on to other endeavours!

Resting and Standing Times: Tie-stall Cows—Pasture Mat® with Premium Pad ™

Cameron Harris, Summer Experience Student, Veterinary Science and Policy Unit, OMAFRA

Hobo Pendant G Data Loggers (Onset Computer Corporation, Pocasset, MA) were placed on the right hind legs of 20 Holstein cows to determine resting and standing times. The cows were housed in a 6-month-old tie-stall barn. Each stall was 69 inches long from gutter to manger curb and 54 inches wide. The tie rail was 45 inches high and the tie-chain length was 36 inches including the snap. The beds were Pasture Mat® with two layers of Premium Pad™ foam. Three pounds of chopped straw bedding were added each morning. Data were recorded over nine days from May 8 to May 16, 2010.

On a daily basis, cows showed 5.38 ± 2.94 lying-right bouts, 5.29 ± 1.79 lying-left bouts, and 8.93 ± 2.36 standing bouts (**Figure 1**). There was no significant difference ($p = 0.892$) between lying-right and lying-left bouts per day.

The average number of hours per day spent lying on their right and left side were 6.95 ± 3.18 and 7.34 ± 2.47 respectively, for a total of 14.29 ± 3.12 hours per day resting (**Figure 2**). On average, each cow stood for 9.71 ± 3.12 hours per day. The difference between the lying left and right times was not significant ($p = 0.717$). Overall, the cows spent 4.58 more hours per day lying than standing.

Two cows had sore feet and rarely rested on their right sides. When the two cows' data was omitted, the lying-right and lying-left bouts per day increased to 5.93 and 5.35 respectively, and the lying-right and lying-left hours per day changed to 7.65 and 7.02 respectively. The overall standing hours per day decreased to 9.33. The producer noted no adverse effects from the loggers on the daily activity of his cattle.

In this tie-stall barn, there was no significant difference between the number of lying-right and lying-left bouts per day or the time spent lying on right and left sides. On average, the cows laid down for approximately 4.5 hours more per day than they stood. In a study by Haley *et al.*, uncomfortable cows (on concrete and straw) laid down for only

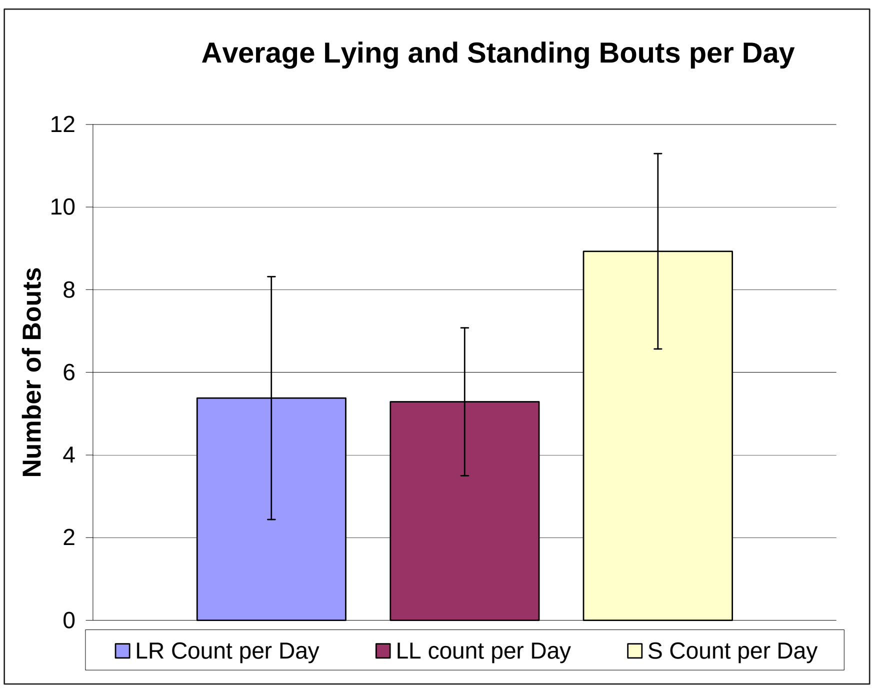

Figure 1. Average standing and resting bouts for 20 cows in tie-stall housing with Pasture Mat® and Premium Pad™

(Continued on page 8)

10.42 ± 0.42 hours per day (1). Cows that lie down for a longer time tend to have a higher comfort level, which corresponds to increased milk quality and overall health and longevity (2).

1. *Haley DB, Passillé AM, Rushen, J. Assessing cow comfort: effects of two floor types and two tie stall designs on the behaviour of lactating dairy cows. Applied Animal Behaviour Science 2001; 71(2):105-117.*
2. *House, H. Lying Down on the Job. Ontario Ministry of Agriculture, Food and Rural Affairs (1999).* *www.omafra.gov.on.ca/english/livestock/dairy/facts/info_lyingdown.htm*

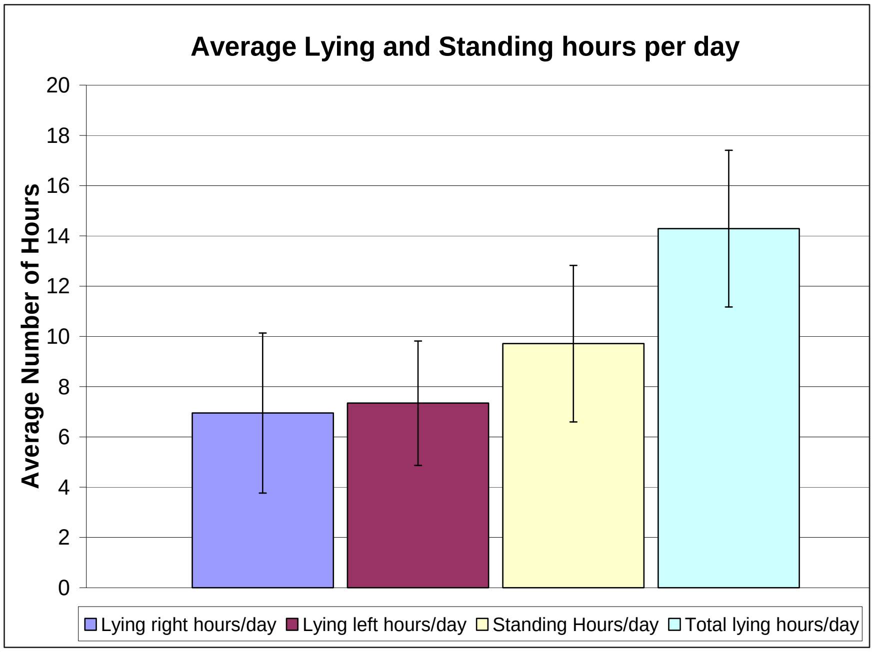

Figure 2. Average standing and resting hours for 20 cows in tie-stall housing with Pasture Mat® and Premium Pad™

How Much Milk Replacer Calves Choose to Drink

Neil Anderson, Veterinary Science and Policy Unit, OMAFRA

Calves possess inborn knowledge about how much milk or milk replacer they need to meet their potential for daily gain. Three to five litres (L) per day (d) are conventional feeding practices or label directions for feeding 4-5-day-old calves. At seven days of age, 4-6L/d, and, for week two and later, 6-8L/d are practices or recommendations. This article shows how much milk replacer 3-11-day-old calves chose to drink when fed by an automated feeder at an Ontario farm. These findings should stimulate thought about our recommendations or practices and a calf's needs for potential growth.

Materials and Methods

The milk replacer (20% protein/15% fat) carried a label that instructed the user to mix 125g/L, to feed 2L of solution at two feedings per day for ages 5-7 days, 5L per day for week two of life, 6L per day for weeks 3-6, and to offer an extra feeding during extreme conditions (cold or wind). Measurements showed that, during the bottle feeding stage, the producer offered calves milk replacer solution mixed at 180g/L and a maximum of 4L/d. The automated feeder (Urban GmbH & Co) mixed 149g of powder in a litre of water and it was checked weekly for calibration. It provided 8L per day upon entry and an increase of one litre per day to a maximum of 12L. By day five on the feeder, calves could consume a maximum of 12L. Eighty-five percent of calves were introduced to the feeder between one to three days of age. The calves were born between August 2009 and May 2010. Calf housing was a plastic-tarp-type barn with natural ventilation and straw bedding during fall to spring months.

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Results

Data in **Table 1** show that 73% of the calves chose to drink >4L/d, 61% >5L/d and 33% >6L/d at four days of age. Fifty-seven percent of the study-farm calves chose to drink >6L/d at seven days of age. Between 3-11 days of age, 32-81% of calves chose to drink >6L/d and 3-45% chose to drink >8L/d.

Discussion

Feeding practices did not conform to label directions. A theory that hungry calves get sick influenced the programming of the automatic feeder. Protein and fat content of the milk replacer solution was less than an equal volume of average-testing Holstein milk (e.g., 26%P/29%F on a dry matter basis). The variance in nutrient density may have stimulated calves to consume the volumes of milk replacer solution that they did to meet their needs for potential growth. Data for the day of introduction, a training day, were not included in this report. Some reluctant-drinker calves may have affected intake data on a few days immediately following introduction to the machine. However, after five days of age, there were only a few new introductions that could have skewed intake data at the day of age shown in Table 1. With allocations of 8-12L of milk replacer per day, calves had the ability to drink to meet their needs or wants. Whereas the label recommended feeding 4L/d to 6L/d (cold conditions), 73-78% of the 4-5d-old calves chose to drink >4L/d and 33-44% chose to drink >6L/d. Moreover, the label recommended 5L/d to 7.5L/d (cold conditions) and 39-64% of the 8-11d-old calves chose to drink >7L/d. Both feeding by the label and programming the automated feeder to deliver 6L/d for 3-11d-old calves would have restricted calves to a fraction of their potential. (Please see shaded row in Table 1.) Generous programming of the automated feeder allowed calves to show how much milk replacer solution they wanted or needed to meet their needs. Outcomes from these observations may not apply to other feeding regimes.

Over the past several months, advisors and milk replacer manufacturers have increased concentrations of powder per litre and volumes per day. This summer, some Ontario manufacturers and sellers of milk replacers may meet to consider additional updates to feeding directions for milk replacers. The steps are positive and deserve praise. Let's applaud their efforts, encourage quick changes to labels, and look for new information being delivered at outreach programs this winter.

Table 1. Proportion of Calves Drinking >4-10L/d of Milk Replacer (20% Protein/15% Fat, 150g/L) Between 3-11 Days of Age When Using an Automated Feeder

	Day of Age								
Volume/d	3	4	5	6	7	8	9	10	11
>4	67	73	78	82	84	90	87	91	97
>5	62	61	63	61	70	74	79	81	91
>6	32	33	44	36	57	58	63	68	81
>7	23	23	35	29	39	39	47	57	64
>8	3	7	15	21	28	21	36	29	45
>9	3	2	5	11	16	11	19	19	28
>10	0	0	2	2	7	6	9	14	17
# Calves	39	84	101	107	106	106	104	106	104

About Calf-weaning Nose Rings and Starter Rations

Neil Anderson, Veterinary Science and Policy Unit, OMAFRA

Some recent revelations have me thinking that weaning-time intersuckling by dairy calves may be associated with hunger. Without prejudice to the breed, the behaviour seems most common, but not exclusive, to Jersey calves. A suckling calf poses a hazard to pen-mates through damage to developing udders. Intersuckling may be prevented by feeding management rather than by having to resort to the use of calf-weaning nose rings.

Following removal of milk from the diet, a calf experiences a significant decrease in daily protein intake that may trigger hunger-related intersuckling. Prior to weaning, calves consume milk or milk replacer (20-27% protein on a dry matter basis) plus starter rations (16-20% protein). Starter often provides the major or only protein source after weaning. If hunger from decreased protein intake triggers intersuckling, then prevention may be as simple as feeding a starter containing 24-26% protein prior to and after weaning.

That's my theory. Testing it should be inexpensive, quick and easy with cooperative producers who are dealing with intersuckling calves. Next time you see a client's calves wearing calf-weaning nose rings, investigate the feeding practices. If appropriate, recommend a change to a high protein starter. A bit of research may show that feeding negates the need for nose rings, removes a hazard from the pen and restores natural cuteness to our calves. Let me know your results and I'll share the information.

Johne's Vaccination: Why or Why Not?

Jamie Imada, Summer Experience Student, and Ann Godkin, Veterinary Science and Policy Unit, OMAFRA

If Johne's disease is a problem in Ontario, why not just vaccinate our herds? In a few studies, vaccination has proven to decrease shedding and reduce or delay the development of clinical signs [1,2,3]. Is it an effective solution for dealing with *Mycobacterium avium subspecies paratuberculosis* (MAP) infection?

Groenendaal and Galligan [4] used modelling to evaluate the effects of various control programs. Their results showed that, when used separately, both vaccination programs and good calf management practices were able to reduce economic losses attributable to paratuberculosis but vaccination was unable to reduce the prevalence. Both Reddacliff *et al.* [1] and Eppleston *et al.* [2], in their research on the efficacy of a paratuberculosis vaccine in sheep, warned that there was still a risk of disease transfer due to the significant portion of vaccinates with subclinical infections. Furthermore some vaccinates still shed large amounts of the bacterium in their feces.

Does vaccination have an advantage over using a test and cull program? Juste *et al.* [5] in a recent study on an experimental vaccine, came to the conclusion that either test and cull programs or vaccination were able to significantly reduce the frequency of shedders, as well as the amount of bacteria being excreted. However, in studying the long-term effects of vaccination of dairy cattle, Kalis and associates [6] found no significant difference between the prevalence of paratuberculosis (as determined by fecal culture) between vaccinated and unvaccinated herds in the Netherlands.

Some potential complications associated with vaccine use include:

1. Cross reaction with tuberculin skin tests
2. False-positive test results when using Johne's ELISA tests
3. The requirement to vaccinate calves at less than 35 days of age
4. The occurrence of large persistent granulomatous lesions at the injection site
5. The requirement for special import permits to obtain the vaccine through CFIA. The vaccine is not licensed in Canada. Veterinarians, on behalf of their clients, must complete a special permit for importation. Furthermore, special conditions,

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such as animal identification and records of vaccination, must be adhered to. More information can be found at *www.inspection.gc.ca/english/anima/vetbio/info/vb325e.shtml*

Recently, researchers have found that a subunit vaccine using MAP heat shock protein 70 may reduce fecal shedding without causing cross reaction in tuberculin skin tests. In addition, using an adapted ELISA test, they were able to avoid the confounding effects on paratuberculosis diagnostic tests, and to distinguish vaccination antibodies from antibodies generated from field infection [7].

In the simulations done by Groenendaal and Galligan [4], the only applicable strategies that worked to reduce the prevalence of paratuberculosis were calf management practices. This is similar to the conclusions of other studies [3,6]. According to most of the available literature, producers should look at management practices, specifically those dealing with young stock, rather than relying on the use of killed vaccines alone to deal with Johnes.

In conclusion, **vaccination may have a role in the control of Johne's disease, particularly in high prevalence herds. It can be considered as part of a combination approach to reduce the level of shedding in infected animals**.

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2. *Eppleston J, Reddacliff L, Windsor P, Links I, Whittington R. Preliminary observations on the prevalence of sheep shedding Mycobacterium avium subsp paratuberculosis after 3 years of a vaccination program for ovine Johne's disease. Australian Veterinary Journal 2005; 83(10):637-638.*
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Does Swine Influenza Virus Vaccination Affect Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) Serology?

Janet Alsop, Veterinary Science and Policy Unit, OMAFRA

In PRRSV-negative swine herds, the detection of positive animals during serological monitoring results in anxiety and added expense for producers. In 2009, the Animal Health Laboratory in Guelph reported a higher than expected proportion of false-positive PRRSV samples in two PRRSV-negative herds in Ontario following the use of swine influenza virus (SIV) vaccine. An investigation was carried out to determine if there was a statistically significant increase in animals that tested positive on PRRSV ELISA after SIV vaccination in the two herds.

Herd A is a PRRSV-negative herd that did not vaccinate pigs against SIV prior to June 2009. At that time, the owner vaccinated all animals in the barn against SIV, following an SIV outbreak at another location within the same production system. Herd B is a PRRSV-negative herd that vaccinates animals against SIV every fall. Both herds used the same brand of SIV vaccine in 2009.

All serum samples were analyzed by the IDEXX HerdChek PRRS 2XR ELISA. There were 330 samples from herd A—150 samples collected prior to SIV vaccination and 180 samples collected after SIV vaccination. In the six-month period prior to SIV vaccination, no animals tested positive. In the six months following vaccination, a total of three

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different animals tested positive on three separate test dates. From herd B, there were 147 samples—116 samples collected from 76 animals prior to SIV vaccination and 31 samples collected from 28 animals after SIV vaccination. Of the animals tested in the six-month period prior to SIV vaccination, 2 (2.6%) tested positive, both in the same month. During the three months following SIV vaccination, 2 animals (7.1%) tested positive (**Table 1**). One of these animals had tested positive prior to vaccination. Further testing (IFA and PCR) of all ELISA-positive animals in both herds was negative for PRRSV. To date, both herds have remained PRRSV negative on subsequent testing.

Table 1. Herd B—Test Status Pre– and Post-vaccination

	Pre-SIV vaccination	Post-SIV vaccination
PRRSV ELISA Negative	74	26
PRRSV ELISA Positive	2	2

There was no statistical difference in the number of animals that tested positive on PRRSV ELISA before and after SIV vaccination in either of the two study herds. Because of the small sample size, there was likely insufficient statistical power to make a definitive statement regarding the statistical difference in test status. In one herd (A), there was a significant difference ($P<.01$) in the value of the S/P ratios before and after vaccination, with the average titres being lower after vaccination (**Table 2**). This was because, although there were some positive S/P ratios after vaccination, there were also more animals with an S/P ratio of 0.000 after vaccination than before vaccination.

Table 2. Herd A—PRRS virus S/P ratios in non-vaccinated and vaccinated groups

	Mean	Median	Minimum	Maximum
Non-SIV vaccinated group	.060	.046	.000	.289
SIV vaccinated group	.041	.002	.000	1.184

Testing of larger numbers of animals would be useful. Practitioners in Ontario who have clients with PRRSV-negative herds that are using SIV vaccine are asked to contact Janet Alsop at janet.alsop@ontario.ca .

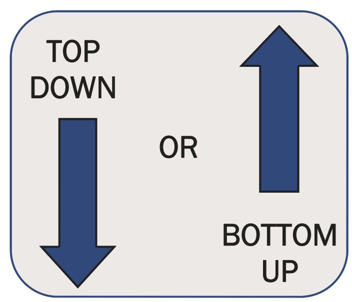
Thank you to the swine practitioners who provided the data and to Dr. Ulrike Sorge, Department of Population Medicine, University of Guelph, for assistance with data analysis.

Biosecurity from the Bottom Up

Tim Blackwell, Veterinary Science and Policy Unit, OMAFRA

At the most recent meeting of the American Association of Swine Veterinarians, Dr. Harvey Hilley described his approach to developing effective biosecurity programs on the swine farms he services. Dr. Hilley indicated that most biosecurity programs are presented in a "top down" manner, i.e. a set of biosecurity rules or practices that are established as standard operating procedures on a farm and presented as a decree from the owner or manager. Harvey argued that those responsible for implementing an effective biosecurity program—the barn workers—may not fully comprehend or adopt these practices on a daily basis.

Dr. Hilley's approach is to meet with the barn staff to describe the costs associated with disease breaks. He then explains some basic principles of pathogen biology and survival. He lets the staff discuss where pathogens might enter a swine unit and how best to control such entry. This approach allows the staff to take ownership of disease prevention on the farm. It provides them with the necessary background to understand the principles of biosecurity and thus makes it possible for them to make appropriate decisions regarding pathogen exclusion. In addition, a working understanding of pathogen survival and spread allows stockpeople to quickly adjust to circumstances that may affect the likelihood of pathogen introduction.



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Harvey reports that, since he changed his approach to introducing biosecurity programs from a "top-down" to a "bottom-up" approach, compliance and enthusiasm for maintaining a high level of biosecurity on his clients' farms has improved immensely. As more emphasis is placed on biosecurity in the future, allowing the most critical elements of a biosecurity program—the stockpeople—to devise farm-specific programs themselves will pay dividends over time.

How "Natural" are Dominance Hierarchies in Group-housed Sows?

Tim Blackwell and Kathy Zurbrigg , Veterinary Science and Policy Unit, OMAFRA

It is commonly stated that sows "naturally" establish a pecking order when placed in group housing. In reality, sows establish a dominance hierarchy when they perceive that there are restrictions on necessary resources. Sows do not waste energy on low-return/high-risk activities. When resources are plentiful and appear so to the sow, fighting is perceived as pointless. Fighting in group-housed sows, therefore, is more accurately termed an adaptive behaviour rather than a "natural" behaviour.

Specific behaviours are expressed within appropriate environments. Animals flee when pursued; fight when trapped. They establish social hierarchies when specific resources are restricted and they adapt to their environment. It is more common to find an aggressive boss cow when feed is delivered in a feed bunk rather than when the same animals are placed on lush pasture. This is why it is important that the design and management of group-housing gestation pens signal to sows that all necessary resources are in adequate supply.

Estevez *et al*. discussed behaviours in domestic animals triggered by the perception of limited resources. They described how aggressive interactions require the expenditure of energy and pose a risk of injury to the animals engaged in establishing a hierarchy. The conclusion is that aggressive interactions are not undertaken unless the rewards appear to outweigh the risks. With this in mind, when fighting, injuries and lameness occur in a group-housing system, we should examine the environment for factors that create a perception of limited critical resources.

There are only a few items of critical importance to a gestating sow. They include food, water, and a comfortable resting place. It is important to understand that a sow's perception of her environment is absolutely critical to effective pen management and design. For example, when sows are fed a concentrated, nutritionally complete ration once per day, they commonly perceive that feed is limited even though they are receiving an adequate plane of nutrition. This is because, when sows consume their daily required intake of nutrients in 15 minutes and do not have another feeding for 23 hours and 45 minutes, they perceive that feed is in limited supply and will fight to obtain a greater share at the next feeding.

Several approaches exist to address the perception of limited resources created in once-a-day fed group-housed sows. In Europe, sows are locked in stalls at feeding time to avoid aggressive encounters. However, there is a significant cost for the feeding stalls, which seem even more exorbitant because they are only required during the 15 to 20 minutes each day when sows are fed.

A floor feeding system for sows is a much more economical system and can be designed to avoid any perception of limited resources, especially with regard to feed. Fighting is no more natural in sows than in other species. By avoiding the perception of limited resources, the natural behaviour of group-housed sows will be complacency.

Successful designs for floor feeding gestating sows are described in the video, " Making the switch to group housing," that can be ordered from OMAFRA by contacting Kathy Zurbrigg at (519) 846-3418 or kathy.zurbrigg@ontario.ca

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Sheep Livers Condemned due to *Ascaris suum*

Jocelyn Jansen, Veterinary Science and Policy Unit, OMAFRA,
Lotje Kouwenberg, Harwich Veterinary Clinic, Blenheim, and
Andrew S. Peregrine, Department of Pathobiology, Ontario Veterinary College

In May 2010, an Ontario sheep flock experienced liver condemnations due to the swine parasite, *Ascaris suum* (*A. suum*). Lambs were sent to a processing plant, where routine inspection revealed that the livers, specifically the bile ducts, were heavily infested with numerous live nematodes. The nematodes were found in the livers of two of the 20 lambs sent to the abattoir by the producer. Identification of *A. suum* was confirmed at the Animal Health Laboratory (AHL) and the Ontario Veterinary College (OVC), University of Guelph, by parasite morphology. This was a novel condition for both the producer and the processor.

Currently the flock size of the operation is approximately 40 ewes, with an average of 80 to 90 lambs marketed per year to both direct slaughter and to sales yards. The flock is housed in a renovated swine facility that was previously a farrow-to-wean operation. The producer used injectable ivermectin in sows prior to farrowing. He took advantage of the national Cull Breeding Swine Program and is now using his former dry sow and breeding areas to house ewes, lambs and rams during lambing in the winter and early spring. The flock is grazed during the summer and early fall. The flooring is concrete with straw bedding added. Pens are separated by metal gating. The barn was cleaned and disinfected prior to housing the sheep. The lambs are fed a creep ration while nursing their mothers and some are sent directly to slaughter without weaning, while others are weaned, dewormed and sent to slaughter later, depending on the current market conditions and their size. The ewes are dewormed twice annually with ivermectin. This year the lamb crop has shown no clinical evidence of parasitism, nor any other diseases such as pneumonia or scours. In 2009, some of the lambs showed respiratory disease, several were unthrifty and gastrointestinal parasites were a significant problem.

A. suum is the large roundworm of swine and is the most common gastrointestinal parasite of pigs. It is more common in growing pigs than in mature pigs. Infective *A. suum* eggs will hatch in a number of animal species, including ruminants. Once ingested by sheep or cattle, larvae migrate through the intestinal wall, reach the portal vein and are transported to the liver. From the liver, larvae enter the hepatic venous system and are transported to the lungs. Larvae do not usually migrate beyond the lungs in foreign hosts and are generally unable to develop to mature adults in the intestine. However, immature adults (**Figure 1**) have occasionally been found in the small intestines and bile ducts of sheep, as in this case. During migration, the larvae can damage the liver and lungs. In the liver, migration can cause hemorrhage and fibrosis that appears as white spots ("milk spots") on the surface of the liver and leads to condemnation of the liver at slaughter. In the lungs, the larvae may cause hemorrhage and/or a parasitic pneumonia. In sheep and cattle exposed to contaminated environments and grazing areas, reported clinical signs include acute dyspnea, tachypnea and coughing as the larvae migrate through the lungs. In general, the condition is most commonly seen during the warm summer months but tends to disappear during the fall, winter and spring when temperatures are too low to allow for the eggs to develop to the infective larval stage.

Figure 1. Immature adults of *Ascaris suum*.

Over the past two years, Ontario has seen an increase in the number of swine operations being converted to sheep operations. *A. suum* eggs are thick-shelled and very hardy in the environment. They are resistant to disinfectants and different types of weather. They can survive in cool, moist surroundings for up to five years. Thus, sheep can

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be exposed to these eggs in such facilities and develop problems. It is unclear how common this problem is in Ontario sheep flocks. However, it is a very rare diagnosis at slaughter.

Routine treatment of sheep with anthelmintics for *A. suum* is not justified due to the life span of the eggs and the unknown time(s) of exposure. However, *A. suum* should be considered as a differential diagnosis if sheep (particularly lambs) are diagnosed with pneumonia and they are unresponsive to antibiotic treatment, particularly if the sheep have been moved into former swine housing within the past five years. Treatment options at that time could include ivermectin or fenbendazole. Hygiene practices prior to moving sheep into swine housing may help to lesson the risk of infection. All bedding and manure should be removed. Steam cleaning of walls, floors and feed troughs will limit the risk of infection; eggs are destroyed by temperatures greater than 60°C. Sheep producers should be made aware that, if they are moving animals into a barn that previously housed swine, *A. suum* infection could result in health issues and liver condemnations.

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Large Animal Experience for Veterinary Technicians

Kathy Zurbrigg , Veterinary Science and Policy Unit, OMAFRA

A recent study by Fanning *et al.* stated that the gross income of a veterinarian increased by $93,311 for each credentialed veterinary technician (VT) per veterinarian that the clinic employed [1]. The study did not imply a causal relationship but rather that highly productive clinics utilize their technicians to the fullest and that this practice can provide financial benefits. Although VTs are frequently well utilized in small-animal medicine, large-animal clinics are not as quick to adopt this practice.

According to the regulations of the College of Veterinarians of Ontario, there are a variety of tasks that VTs can perform on farm for mixed or large-animal veterinary clinics under the direction of a veterinarian. These include (but are not limited to) calf dehorning (with lidocaine block), vaccinating, milk sample collection for culture and ovulation-synchronization injections. The most obvious benefit of having a technician perform these tasks is the more efficient use of the veterinarian's time. However, a second benefit is the ability of the clinic to offer a service to their clients at decreased cost. Like the rest of the world, producers are busy people and many would readily accept a service that could make their life easier and improve their herd management, if the price is right.

Few large- or mixed-animal practices in Ontario use a VT for field service. A potential reason for this is that there are few VTs with knowledge of farm management and large-animal handling skills. College programs for VTs have decreased their focus on livestock medicine during the past ten years since the job market is predominantly in small-animal clinics. So was it the chicken or the egg? Regardless of the reason, college programs are unlikely to change their small-animal focus unless livestock veterinarians create a demand for such training.

If practical large-animal experience is not offered within a college VT program, few students will develop an interest in working with livestock. A pilot two-week-long, large-animal skills certificate program was developed by OMAFRA in conjunction with the VT program at Georgian College. A total of ten VT graduates from Georgian College were accepted into the program. The goal of the program was to stimulate technicians' interest in large-animal medicine and to enhance their skill set to include on-farm tasks commonly carried out under the direction of a large-animal veterinarian.

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The program ran from May 3-May 14, 2010. The participants were housed in residence at the University of Guelph. They were split into two groups of five and each group completed one week of equine and one week of bovine skills. All participating clinics and farms received a stipend. Five large-animal clinics participated in the bovine skills program. Each clinic provided a 2-3 hour hands-on training laboratory on a farm, where the participants practised a variety of skills. Clinics then provided participants with farm-call experience for the remainder of the day. Students also spent one day at the Gencor facility near Guelph completing a training session in artificial insemination and embryo transfer theory and skills and a half-day wet laboratory in large-animal parasitology at OVC. Four equine veterinary groups (3 hospitals and one mobile practice) provided the equine training sessions for the students. Participants practised the technician skills needed in various work settings, including surgical practice, performance diagnostics, racetrack practice and farm visits.

The overall experience was positive for both participants and clinics. The ten participants came into the program with a desire to learn, but unsure of what a career in a large-animal practice could offer them. After being involved with the program, all ten hope to find work in an equine or food-production practice, with several starting to look for volunteer or part-time work on dairy farms to increase their experience. All of the clinics stated that they enjoyed the experience and would participate again if a program was offered. The project stimulated discussion within clinics not currently using a technician in the field regarding the potential benefits of having VT staff for large-animal field work.

Thanks to the following clinics for their participation and hard work in making this project a success: Guitard Equine Services, Listowel Veterinary Clinic, Mckee-Pownall Equine Services, Milton Equine Hospital, Milverton-Wellesley Veterinary Services, Mitchell Veterinary Services, Ontario Veterinary College, Tavistock Veterinary Services and the Toronto Equine Hospital.

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Available Resources

The Rabies Reporter

The January—March 2010 issue of *The Rabies Reporter*, published by the Ontario Ministry of Natural Resources (MNR), is now available at *www.mnr.gov.on.ca/en/Business/Rabies/2ColumnSubPage/196811.html* To learn more about MNRs rabies control programs, visit the **Rabies in Ontario** website at *www.mnr.gov.on.ca/en/Business/Rabies/index.html*

Addition to the CanWest DHI Mastitis 3 Test for the Diagnosis of Contagious Mastitis

CanWest DHI has modified the Mastitis 3 PCR test to include the identification of *Mycoplasma bovis* (*M. bovis*) as part of their mastitis testing service. This additional test is provided at no additional cost to the customer. The Mastitis 3 service now identifies the three contagious mastitis bacterial pathogens *Staphylococcus aureus* (and the presence of the beta lactamase gene), *Streptococcus agalactiae* and *Mycoplasma bovis*.

From herd surveys done to date, *M. bovis* mastitis has not been found to be common in Canada, but there is concern that, if introduced to a herd by the addition of purchased cows, it could spread widely before being diagnosed. The PCR test is another tool to assist in screening cows for this type of mastitis.

DairyComp305

The University of Minnesota College of Veterinary Medicine is pleased to announce the introduction of the newly revised, online, self-paced, introductory course for DiaryComp305. This continuing education course is practical, hands-on, and available to you 24 hours a day. The course starts July 19, 2010 and ends September 27, 2010. Registration deadline is July 12, 2010. *www.MNDairyHealth.org*

Continuing Education/Coming Events

July 7-10, 2010	62nd Canadian Veterinary Medical Association Convention, Hyatt Regency/Fairmont Palliser, Calgary, Alberta. *http://canadianveterinarians.net/professional-convention-highlights.aspx*
July 11-15, 2010	Joint Annual Meeting of the American Dairy Science Association® (ADSA®), the Poultry Science Association (PSA), the Asociación Mexicana de Producción Animal (AMPA), Canadian Society of Animal Science (CSAS), Western Section of ASAS (WSASAS), and the American Society of Animal Science (ASAS), Colorado Convention Center, Denver, Colorado. *http://adsa.psa.ampa.csas.asas.org/meetings/2010*
July 18-21, 2010	21st International Pig Veterinary Society Congress—Sharing Ideas-Advancing Pig Health, Vancouver Convention and Exhibition Centre, Vancouver, British Columbia. *www.ipvs2010.com*
August 10-12, 2010	International Goat Symposium, Rotary Complex, Stratford, Ontario. *www.goatsymposium.com/index.htm*
August 11, 2010	Small Ruminant Veterinarians of Ontario Meeting—Keeping the Goat Herd Healthy and Productive, Stratford, Ontario. Contact Jocelyn Jansen, jocelyn.jansen@ontario.ca , (519) 846-3414.
August 19, 2010	George A. Young Swine Health and Management Conference, Marina Inn, South Sioux City, Nebraska. *http://georgeyoungswineconference.unl.edu*
August 19-21, 2010	American Association of Bovine Practitioners 43rd Annual Conference, meeting jointly with the American Association of Small Ruminant Practitioners, Albuquerque Convention Center, Albuquerque, New Mexico. *www.aabp.org/meeting/conference.asp* and *www.aasrp.org/cde.cfm?event=305168*
September 1-3, 2010	Compassionate Conservation: Animal Welfare in Conservation Practice—an international symposium, Lady Margaret Hall, University of Oxford, United Kingdom. *www.compassionateconservation.org*
September 8 & 9, 2010	NMC Regional Meeting, Crowne Plaza Hotel, Grand Rapids, Michigan. *http://nmconline.org/meetings.html*
September 18-21, 2010	Allen D. Leman Swine Conference, RiverCentre, St. Paul, Minnesota. *www.cvm.umn.edu/vetmedce/events/adl*
October 21-23, 2010	American Embryo Transfer Association (AETA) and Canadian Embryo Transfer Association (CETA/ACTE) 2010 Joint Scientific Convention, Embassy Suites Golf Resort & Spa, Charlotte-Concord, North Carolina. *www.ceta.ca/convention.htm*
November 11 & 12, 2010	Poultry Innovations Conference, Niagara Falls, Ontario. *www.poultryindustrycouncil.ca/events/events.php*
November 14-18, 2010	26th World Buiatrics Congress, Espacio Riesco Convention Centre, Santiago, Chile. *www2.kenes.com/buiatrics2010/congress/Pages/General_Information.aspx*
December 3 & 4, 2010	2010 International PRRS Symposium, Downtown Chicago Marriott, Chicago, Illinois. *www.prrssymposium.org*
December 4-8, 2010	56th Annual American Association of Equine Practitioners Convention, Baltimore, Maryland. *www.aaep.org/convention.htm*
January 23-26, 2011	NMC 50th Annual Meeting, Hyatt Regency Crystal City, Arlington, Virginia. *http://nmconline.org/meetings.html*
March 5-8, 2011	American Association of Swine Veterinarians 42nd Annual Meeting, Pointe Hilton Tapatio Cliffs Resort, Phoenix, Arizona. *www.aasv.org/annmtg*

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