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outbreak investigation and animal health surveillance**



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Another Member of our Unit Honoured for her Accomplishments - Congratulations Ann!!



Ann Godkin accepts the Ralph J. Barichello Award from Jersey Canada Executive Secretary, Russell Gammon, at the 2010 Jersey Canada Annual Meeting. (Photo courtesy of Jersey Canada)

The Ralph J. Barichello Award was established by the Barichello family and Jersey Canada in 1986. Mr. Barichello, a Past President of Jersey Canada, was a leader in his community, his province (British Columbia) and nationally in agriculture and 4-H. The award recognizes outstanding contributions to agriculture in Canada and volunteer leadership in the local community.

At the 2010 Jersey Canada annual meeting, Ann Godkin was named the 25th recipient of this prestigious award.

Currently, Ann's main areas of interest are mastitis and Johne's disease prevention and control but, during her career, she has also addressed milk quality, lameness, bovine viral diarrhoea, milk fever, cow comfort and environmental issues.

Ann's commitment to helping producers and veterinarians, her leadership roles with industry organizations and her active participation in local community activities (Pony Club, soccer

and ringette) make her a worthy recipient for this award.

Way to Go, Ann – You deserve it!

To view Jersey Canada's complete tribute to Ann, refer to
Jersey Canada Awards Ralph J. Barichello Award to Dr. Ann Godkin of Ariss, Ontario, Jersey Canada website

www.jerseycanada.com/news/barichelloaward2010.php

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Dr. Ken Leslie Wins 2010 AABP-Intervet Mentor Award

Ontario Veterinary College (OVC) faculty member, Dr. Ken Leslie, received a major award at the American Association of Bovine Practitioners (AABP) conference in Albuquerque, New Mexico, this past August. Dr. Leslie was named the AABP-Intervet Mentor of the Year, honouring three decades of work as a teacher, adviser and role model. Ken originated the concept of continuing education certificate programs for practitioners at OVC and served as the director of the Dairy Health Management Certificate Program, as well as Dairy Research Co-ordinator, under the University of Guelph – OMAFRA partnership. An accomplished teacher and mentor to DVM and graduate students, he is also recognized for fostering networks of veterinarians and researchers and promoting interest in issues related to the health of dairy cattle.

During his career, Ken has also received the Schering Award for Preventive Veterinary Medicine, the AABP Cyanamid Award of Excellence, the Ontario Association of Bovine Practitioners Award of Excellence, the Canadian Animal Health Institute Industry Leadership Award, and the Pfizer Award for Research Excellence.

Beef-Specific Johne's Disease Awareness Program

***Paul Stiles, Ontario Cattlemen's Association,
Henry Ceelen, Rideau-St. Lawrence Veterinary Services and Ontario Association of Bovine Practitioners, and Ann Godkin, Veterinary Science and Policy Unit, OMAFRA***

Johne's Disease is a production-limiting disease in beef and dairy cattle. To date, studies of the disease in beef cattle have been few and it's commonly felt that infection is less common in beef cattle, but anecdotal reports from veterinarians and beef producers indicate that, when it does strike, the results can be devastating. The disease spreads from herd to herd with the movement of cattle that are infected but show no signs.

The Ontario Cattlemen's Association (OCA) has partnered with the Veterinary Science group at OMAFRA and with the Ontario Association of Bovine Practitioners and has obtained government funding for a beef-specific pilot project. Funding has been secured to pay the cost of herd veterinarians taking blood samples from cows on up to 75 farms with an approximate herd size of 40 cows. These samples will be tested at the Animal Health Laboratory in Guelph for antibodies to *Mycobacterium avium paratuberculosis* (MAP), the bacteria that causes Johne's Disease.

Once the blood test results are known, the veterinarian will return to the farm and discuss the test results with the herd owner. Using the test results to put the herd situation in perspective, the veterinarian and owner will go through a farm Risk

Assessment and Management Plan (RAMP) questionnaire together. This will help the owner to come up with management changes that can minimize the risk of spreading Johne's Disease. Participating producers who complete the questionnaire (RAMP) will be eligible for reimbursement for the cost of the veterinary visits and the testing (\$8/head).

Because spread of this disease is strongly associated with cattle movement (loans, leases, sales and purchases), this initial pilot program is targeted towards purebred (seedstock) herd owners.

Results from the pilot project will be entered in a database to look for patterns of Johne's Disease test results. No individual producer names or cattle breeds will be identified. From this pilot project, we hope to begin to gain an understanding of the prevalence of Johne's Disease among seedstock herds in Ontario.

If you are interested in being involved, please contact Ann Godkin at OMAFRA for details, ann.godkin@ontario.ca or (519) 846-3409. To discuss OCA's involvement, please contact Paul Stiles, stiles@cattle.on.ca or (519) 824-0334.

Participants Sought for Research Project: Pilot Project to Investigate Risk Factors for Prototheca Mastitis

**Ann Godkin, Veterinary Science and Policy Unit, OMAFRA,
Laura Pieper, Population Medicine, Ontario Veterinary College (OVC), University of Guelph,
Durda Slavic, Veterinary Microbiologist, Animal Health Laboratory (AHL)
and Jim Fairles, Client Services Veterinarian, AHL**

Investigations have identified herds with reoccurrences of *Prototheca* udder infections and, in a few situations, herds with epidemics of *Prototheca* mastitis (where more than 20% of cows have positive milk cultures annually). A recent survey of the AHL milk-culture data showed that, since May 2007, 140 herds have had *Prototheca* sp. isolated from at least one milk sample. While 65 herds (46.4%) had only a single positive diagnosis recorded in the AHL database, the rest had multiple positive samples. Overall, a diagnosis of *Prototheca* sp. mastitis has been made in about 3% of Ontario herds since May 2007.

The persistent identification of *Prototheca* sp. in laboratory milk samples suggests that this pathogen is endemic in Ontario. With additional herds receiving a first and then subsequent positive culture results for *Prototheca*, presumably there is an ongoing accumulation of herds in Ontario at risk of future cases.

To date, there have been no formal investigations of Ontario farms experiencing single or multiple cases of *Prototheca* mastitis. While “generic” advice exists, there is a need to ensure that the messages are relevant to the Ontario situation. As Ontario prepares for a move to a regulatory limit of 400,000 cells/ml for bulk milk in 2012, there is a need to enhance our ability to assist herds with *Prototheca* sp. mastitis.

To participate in a pilot research project, veterinary practitioners are asked to identify herds where an isolation of *Prototheca* sp. from a mastitis case has occurred in the last two years. The veterinarian will also be asked to identify similar herds (matched for stall type – free vs. tie – and approximate herd size) from which a control herd can be selected, also from within their practice area.

To determine current herd status with regards to all mastitis pathogens, case and control herds will submit individual cow composite cultures from each lactating cow on a single occasion. Samples will be cultured to identify *Prototheca* sp. and other pathogens. All herd cultures must be completed by February 2011.

Following completion of the herd culture, herd owners will be contacted for participation in a herd visit and completion of a questionnaire administered by an OMAFRA veterinarian or OVC veterinary graduate student. The questionnaire will capture details concerning milk quality and mastitis history, milking practices, milking hygiene product use, lactating and dry cow housing, basic cow management practices, veterinary product use (products and use rates) and results of milk quality measures.

For further information or to enrol a herd, please contact Ann Godkin (ann.godkin@ontario.ca or (519) 846-3409).

June Ceptor—Bovine Viral Diarrhea (BVD) Survey – Veterinary Responses

Ann Godkin, Veterinary Science and Policy Unit, OMAFRA

Thanks to the 29 bovine practitioners from Ontario who returned their surveys following the last **Ceptor**. The respondents reported spending 25 to 100% of their time providing service to dairy producers. These 29 provide service to an average of 67 herds on an annual basis (range 9 to 300) with an average of 31 herds (range 5 to 140) visited monthly.

The respondents reported BVD as being a cause of a dairy-herd problem “occasionally” (15), “rarely” (12) or “often” (1). No one reported it as being a problem “very often” or “never”. Veterinarians had diagnosed BVD from 0 to 5 times by clinical signs (average < 1), 0 to 10 times by testing of live animals (average 1.7) and 0 to 4 times by post-mortem (average < 1). Persistently infected dairy cattle (PIs) had never been identified by 16 of the 29 responders (55%). For the 11 who had identified at least one PI in the last five years, 10 had confirmed at least one calf and five at least one cow.

Respondents were asked to rank how often they felt the various cattle health problems that could potentially be associated with BVD occurred among their clients’ dairy herds as “none”, “few” or “common”. The response “none” was ranked highest for abortion (16), congenital abnormalities (13), poor fertility (12), disease in calves aged 2 months to 2 years (15) and disease in cows (19). The response “few” was ranked highest for Early Embryonic Death (EED) (13) and disease in calves less than 2 months old (14). The response “common” was identified relatively infrequently—for EED by 3 responders, for abortion by 3, congenital abnormalities by 1, poor fertility 3, disease in calves < 2 months of age by 4, disease in calves aged 2 months to 2 years by 2, and by no one for disease in cows.

Not surprisingly, given the low frequency with which the respondents reported finding PIs or felt they had identified health problems likely to be associated with BVD, 17 had no herds on a diagnostic follow-up program, while 11 reported having from 1 to 11 herds doing some kind of a program, such as ear

notching calves or testing fresh heifers.

When asked about what they felt the biggest limitation was to using laboratory tests for BVD diagnosis, nine felt that the difficulty getting samples collected on farm was the biggest limitation to more laboratory test use, eight indicated it was cost, four didn’t feel confident knowing which test to use, two felt that vaccination confounding the interpretation of test results was a limitation, while none felt that they needed different tests.

For vaccination, the average proportion of clients’ herds using vaccination was 88% (range 50 to 100%) with 0 to 100% (average 60%) of clients reported as using modified live virus (MLV) vaccine exclusively. For the vaccination of young calves, seven reported having no clients that vaccinated calves prior to weaning, while 21 had at least one client (range 2 to 80%) doing this. Among these 21, six reported having at least one client that vaccinated calves more than once, prior to or at weaning.

When asked to identify the biggest limitation to BVD diagnosis and control in their clients’ dairy herds right now, 24 of 28 responded the biggest limitation was that BVD was not a priority for their clients, while four felt that there were issues with vaccination (such as a lack of compliance with programs, vaccine failure or over confidence in vaccines).

BVD, in spite of outbreaks of severe clinical disease in Ontario dairy herds in the last 15 years, remains a difficult entity for most respondents to quantify the impact of. PIs are reportedly rare and calf disease is most often cited as the health problem veterinarians associate with BVD. Reported vaccination rates are high, yet compliance with programs is a reported issue felt to be hindering disease control. Partial and fluctuating immunity may be handicapping a complete understanding of the importance of BVD to the Ontario cattle population.

Comparing Sow Condition and Feed Efficiency Between Gestation Stalls and Gestation Housing

*Cameron Harris, Summer Experience Student,
Tim Blackwell and Kathy Zurbrigg, Veterinary Science and Policy Unit, OMAFRA*

Introduction

Research from Kansas State University indicates that sows with a backfat measurement between 16 and 21 mm at farrowing have higher rates of conception compared to sows with a backfat score below 16 or above 21 mm. Thus, maintaining adequate backfat is important for improving piglet production.

Sow housing type may impact on sow backfat gain. While group gestation housing provides sows with a less restricted environment than gestation stalls, a purported drawback is poor feed efficiency as sows “waste” calories walking around the pen. Group housed, floor fed sows may have unequal rates of gain if the amount of feed consumed by each sow cannot be controlled. A pilot project was undertaken to investigate backfat gain among sows on one farm with three different types of gestational housing.

Methods

The trial was conducted on a 350-sow, farrow-to-finish farm in Ontario. The farm is a closed herd.

Stalls and group-housing pens with and without straw were used for gestating sows. Both group-housing systems used calibrated drops to feed on the floor.

The group-housing pens without straw, had floors that were 1/3 slats and 2/3 solid flooring. The solid flooring area used partition walls to divide the space into four separate areas for resting and feeding. Sows in these pens were fed by automatic drops eight times per day. The group-housing pens with straw were rectangular pens with all solid flooring. Sows in these pens were fed once a day.

Sows were weaned into stalls, bred and remained in stalls until pregnancy was confirmed at approximately 35 days post breeding. Using ultrasound, a backfat measurement was taken within a week of sows being confirmed pregnant and

entering the gestation housing, and again approximately one week prior to entering the farrowing room. Pregnant sows with adequate backfat were then randomly allocated to one of the two types of group-housing pens. Thin sows (those with less than 12 mm backfat) spent their entire gestation in stalls and were given additional feed during gestation. However, not all low backfat sows could be left in stalls due to space restrictions. Some thin sows gestated in the group housing.

Sows from all three types of gestation housing (stalls and groups) were moved into the farrowing rooms approximately three to five days prior to farrowing.

Sows in the three gestational housing systems were compared for average gain in backfat, average backfat gain/week, and average backfat gain/week/kg of feed. A subset of sows with backfat less than 12 mm were analysed separately to examine if housing type influenced gain in thin sows.

Results

Results are in **Table 1**. Data were analysed for individual pen effects (no effects found) and then combined by housing type. ANOVA tests comparing average gain, average gain/week and average gain/week/kg of feed by housing type were not statistically different. The sows that gestated entirely in the gestation stalls had the lowest average backfat at the time they moved to the farrowing crate. No statistical differences were found for average gain, average gain/week or average gain/week/kg feed between the three housing types. Among the subset of thin sows (n=29), there was also no difference in backfat measurements by housing types.

Conclusion

While only four months of data were available for analysis, the preliminary results indicate that housing type did not affect rate of gain or feed efficiency in sows on this farm.

(Continued on page 7)

Table 1. Average Backfat, Backfat Changes and Feed Consumption Among Sows in Three Types of Gestation Housing

Pen	Number of Sows	Average Backfat IN (mm)	Average Backfat OUT (mm)	Backfat Gain Avg (\pm SD)* (mm)	Average Time Between Measurements (days)	Amount fed (kg/day/sow)	Percent of Sows that Gained Backfat (%)	Average gain/week (mm)	Average gain/week/kg of feed
Dry sow stalls	33	12.6	14.8	2.2 (2.5)	70.8	3.9	79	0.221	0.055
Group Pen, slats + solid floor, no straw	96	16.7	18.4	1.7 (3.0)	68.8	2.9	66	0.192	0.060
Group Pen, solid floor with straw	88	17.1	18.4	1.3 (2.3)	63.2	2.5	67	0.156	0.062

* Standard deviation

The Range in IgG Values in Suckling Piglets on 11 Ontario Swine Farms

*Ryan Tenbergen, Summer Experience Student, and
Tim Blackwell, Veterinary Science and Policy Unit, OMAFRA, and
Davor Ojkic, Avian Virologist and Immunologist, Animal Health Laboratory*

Pre-weaning mortality is an important loss to the pig industry. Over 10% of piglets that are born alive die before weaning ⁽¹⁾. To ensure sufficient energy supplies and adequate humoral immunological protection, acquisition of colostrum by piglets is important ⁽²⁾. Newborn pigs are in a compromised immunological state at birth ⁽³⁾ and access to colostrum immediately after birth is hindered due to vigorous competition between siblings ⁽⁴⁾. With increasing litter size, an even distribution of colostrum amongst littermates is critical ⁽⁵⁾. In addition, with the reduced antibiotic usage and the requirement for modern sows to rear increased numbers of piglets, piglets must absorb adequate amounts of IgG for disease protection ⁽¹⁾.

Table 1 shows data from a study published in 1981 on piglet serum IgG concentrations from birth to ten weeks of age ⁽⁶⁾. Serum IgG concentration increased from near zero at birth to maximum values by 24 hours ⁽⁶⁾. Levels then decreased to week four where, subsequently, they rose slowly and reached normal adult values by the tenth week of age ⁽⁶⁾. The average

Table 1. Changes in Average IgG Concentration (g/L) in the Sera of Piglets from Birth to 10 Weeks of Age ⁽⁶⁾.

Time	Mean (g/L)	SEM*	Number of Piglets
0 hours	0.09	0.02	36
3 hours	9.42	1.33	31
6 hours	29.56	1.74	33
1 day	39.45	1.46	33
5 days	24.14	0.95	32
1 week	20.92	1.09	34
2 weeks	14.11	1.04	33
4 weeks	8.92	0.59	31
6 weeks	12.71	1.09	25
8 weeks	17.83	1.44	26
10 weeks	21.84	1.93	27

*SEM: standard error of mean

(Continued on page 8)

half-life of serum IgG in the piglet has been reported as 9.73 days ⁽⁶⁾. Having the lowest IgG levels at 28 days of life is of practical importance since, on most large-scale farms, piglets are weaned between three and four weeks of age, when the IgG concentration is at its lowest ⁽⁶⁾. Data from many studies suggest that the IgG content of the colostrum of most sows is adequate to provide sufficient serum levels of IgG to all piglets provided that they ingest adequate amounts of colostrum in a timely manner ⁽⁶⁾.

At the 2010 International Pig Veterinary Society meetings in Vancouver in July 2010, it was reported that, within six hours of parturition, the concentration and biological activity of colostral IgG levels in colostrum decreased ⁽⁵⁾. Piglets consume two thirds of their IgG intake during the first 12 hours after birth ⁽⁷⁾. Six hours after the start of nursing, the IgG fraction of colostrum decreases to 50% of the pre-nursing values ⁽²⁾. Since the farrowing time of sows and gilts can last between three to four hours, early-born piglets have access to colostrum that is much more concentrated in total protein and IgG than late-born piglets, especially in very large litters ⁽²⁾.

Piglets denied access to the sow for more than four hours after birth have been shown to have a 50% lower IgG concentration than piglets that nursed

shortly after parturition ⁽⁸⁾. Piglets who failed to survive absorbed only 10 to 50% as much immunoglobulin in the first 12 hours of suckling as their age-matched surviving controls ⁽³⁾. Since the concentration of IgG in colostrum that any piglet first encounters will be determined by its position in the birth order and length of farrowing, IgG acquisition by piglets later in the birth order may be adversely affected by low colostral IgG concentrations ⁽¹⁾. Evidence suggests that the amount of maternal IgG absorbed is positively related to the subsequent synthesis of IgG by the piglet, thus reinforcing the longer term importance of an adequate IgG intake in the first day of life for piglet growth and survival ⁽¹⁾.

Studies were done this summer by OMAFRA's Animal Health and Welfare Branch to examine the distribution of IgG values in 315 suckling pigs from 11 Ontario swine farms using the VMRD, Inc Single Radial Immunodiffusion Test Kit ^(a). Each farm was visited once and approximately 20 to 40 pigs were bled from between 4 and 13 litters. The results indicated great variability in IgG levels between pigs of similar ages within a farm (**Table 2**). The data also showed what has previously been reported, that IgG levels decline rapidly during the suckling phase (**Table 3**).

Table 2. IgG Values (g/L) in the Sera of 315 Piglets from 11 Ontario Swine Farms.

Farm	Number of Piglets	Number of Litters	Age Range (days)	IgG Range (g/L)	IgG Mean (g/L)
A	30	6	2 - 7	4.90 - 25.50	16.20
B	25	6	6 - 14	6.80 - 32.00	17.50
C	39	9	9 - 14	4.80 - 25.00	11.60
D	24	4	1 - 2	15.00 - 30.00	23.60
E	29	7	3 - 7	4.40 - 39.00	19.00
F	25	12	6 - 21	4.60 - 20.00	8.30
G	32	8	5	3.00 - 34.00	20.20
H	34	7	1 - 5	9.00 - 41.00	20.50
I	31	6	1 - 3	9.40 - 36.00	20.30
J	17	5	3 - 4	9.00 - 25.00	19.00
K	39	8	4 - 18	3.80 - 26.00	9.00
Total	315	78	1 - 21	3.00 - 41.00	16.80

(Continued on page 9)

Table 3. IgG Values in g/L in the Sera of 315 Piglets from 11 Ontario Swine Farms Categorized by Age.

Age (days)	Number of Piglets	IgG Range (g/L)	IgG Mean (g/L)
1	32	9.00 – 41.00	26.29
2	42	9.60 - 36.00	20.35
3	31	9.00 – 39.00	20.27
4	20	9.60 – 29.00	21.34
5	63	3.00 – 34.00	18.61
6	24	4.40 – 32.00	17.80
7	30	4.90 – 23.00	15.99
8	4	17.00 – 23.00	19.25
9	19	10.00 – 22.00	14.35
10	4	7.20 – 16.00	10.93
11	6	6.40 – 13.00	8.50
12	7	10.00 – 14.60	11.44
13	2	8.20 – 10.50	9.35
14	18	4.80 – 11.50	8.78
16	2	8.80 – 11.00	9.90
18	13	3.80 – 7.00	5.32
19	2	6.50 – 7.00	6.75
20	2	5.20 – 5.60	5.40
21	4	4.60 – 5.80	5.40

Ensuring early and adequate colostrum intake is important to prevent piglet death in the early postnatal period ⁽²⁾. Piglet survival is positively correlated with serum concentrations of IgG shortly after birth, and piglets that die before weaning show lower serum IgG concentrations than comparable surviving piglets ⁽³⁾. Therefore, allowing all piglets access to the first colostrum is optimal and may increase the number of pigs surviving to weaning ⁽²⁾.

a. VMRD, Inc. PO Box 502 Pullman, WA 99163 USA.
Email: vmrd@vmrd.com. Website: www.vmrd.com

- Rooke J, Bland I. The acquisition of passive immunity in the new-born piglet. *Livestock Production Science* 2002; 78: 13-23.
- Hendrix W, Kelley K, Gaskins C, Hinrichs D. Porcine neonatal survival and serum gamma globulins. *Journal of Animal Science* 1978; 47:1281-1286.
- Klobasa F, Werhahn E, Butler J. Regulation of humoral immunity in the piglet by immunoglobulins of maternal origin. *Res. Vet. Sci.* 1981; 31:195-206.
- Tuchscherer M, Puppe B, Tuchscherer A, Tiemann U. Early identification of neonates at risk: Traits of newborn piglets with respect to survival. *Theriogenology* 2000; 54:371-388.
- Jourquin J, Engen M, Goossens L. Piglet serum IgG, a non-disruptive method to measure colostrum distribution. *Proceedings of the 21st IPVS Congress, Vancouver, Canada; July 18-21, 2010.*
- Frenyo V, Pethes G, Antal T, Szabo I. Changes in colostrum and serum IgG content in swine in relation to time. *Veterinary Research Communications* 1981; 4:275-282.
- Milon A, Aumaitre A, Dividich J, Franz J, Metzger J. Influence of birth prematurity on colostrum composition and subsequent immunity of piglets. *Ann. Rech. Vet.* 1983; 14:533-540.
- Coalson J, Lecce J. Influence of nursing intervals on changes in serum protein (immunoglobulins) in neonatal pigs. *Journal of Animal Science* 1973; 36:381-385.

Monitoring Boar Studs for PRRSV Using Oral Fluid: Can This Replace Serum Testing?

Janet Alsop, Veterinary Science and Policy Unit, OMAFRA

Boar studs typically monitor animals for Porcine Reproductive and Respiratory Syndrome virus (PRRSV) by testing serum or semen using antibody or PCR tests. Collection of either specimen requires extra time and labour and presents worker safety issues. In addition, there are welfare concerns related to repeated collection of blood samples from individual boars. In human disease monitoring and surveillance, oral fluid specimens are increasingly used in place of serum and, within the past decade, have been used for detection of PRRSV and other pathogens in populations of growing pigs. Kittawornrat and colleagues from Iowa State University, the University of Minnesota and Pig Improvement Company (PIC) North America recently carried out a study to compare oral fluid versus serum for monitoring adult boars for PRRSV infection.

The study was conducted on a total of 72 boars, using 24 in each of three trials. Boars originated from PRRSV-negative breeding stock and negativity was confirmed by individual PRRSV antibody ELISA testing of each animal twice before each trial began. Boars in the first trial were inoculated with a commercial MLV PRRSV vaccine, while those in trials two and three were challenged with one of two PRRSV isolates. Oral fluid samples were collected using cotton ropes fixed at shoulder height at the front of each stall. Oral fluid was collected daily from each boar, beginning seven days prior to inoculation (DPI -7) and continuing for 21 days post-inoculation (DPI 21). The majority of the boars quickly learned to chew the ropes, and samples were collected from an increasing number of animals as they became used to the process, e.g., 80% of boars on DPI -7, 99% of boars on DPI -3. Two boars in Trial 2 showed no interest in the ropes; therefore oral fluid samples were not collected from these animals. In addition, serum samples were collected every seven days by jugular venipuncture from all boars, from DPI -7 to DPI 21. In addition, four boars in each trial were randomly selected for extra blood sampling on DPI 3, 5, 10, 17.

Prior to inoculation or challenge, all ELISA samples tested negative. All serum samples, and all but one of the oral fluid samples, were negative with PRRSV qRT-PCR testing. The single positive sample was interpreted as a false positive on the basis of the cumulative ELISA and PCR results. Following inoculation or exposure, PRRSV was detected in oral fluid early in the course of infection in all three trials, e.g., 10% of boars on DPI 1 and 100% of boars on DPI 4. A comparison of matched samples from individual boars, where both oral fluid and serum results were available, showed that there were statistically significant differences in the number of positives, with a higher number of oral fluid samples than serum samples testing qRT-PCR positive during the course of the study (**Table 1**). There was a significantly lower volume of fluid collected after PRRSV inoculation, but there was still enough for PCR testing.

This study showed that oral fluid sampling in boar studs offers several advantages over serum for monitoring PRRSV status: easier and more frequent sample collection, no stress on either animals or employees and a cumulative greater likelihood of detecting PRRSV. The disadvantages are that some boars do not cooperate with oral sampling and that, because more animals may be tested more frequently, there may be a greater chance of one or more false-positive results and resulting disruption to stud activity.

Kittawornrat A, et al., Porcine reproductive and respiratory syndrome virus (PRRSV) in serum and oral fluid samples from individual boars: Will oral fluid replace serum for PRRSV surveillance? Virus Res. (2010), doi:10.1016/j.virusres.2010.07.025

(Continued on page 11)

Table 1. Serum and Oral Fluid PRRSV qRT-PCR-Positive Results by Day Post-inoculation (DPI).

	Sample	DPI 0 positive/tested	DPI 7 positive/tested	DPI 14 positive/tested	DPI 21 positive/tested
Trial 1	Oral fluid Serum	1/24 (4.2%) ^a 0/24	24/24 (100%) 24/24 (100%)	20/24 (83%) ^b 16/24 (67%)	21/24 (88%) 21/24 (88%)
Trial 2	Oral fluid Serum	0/22 0/22	22/22 (100%) 22/22 (100%)	20/20 (100%) 18/22 (90%)	20/21 (95%) ^b 15/22 (68%)
Trial 3	Oral fluid Serum	0/24 0/24	23/23 (100%) 24/24 (100%)	24/24 (100%) 22/24 (92%)	19/22 (86%) 19/24 (79%)
Total	Oral fluid Serum	1/70 (1.4%) 0/70	69/69 (100%) 70/70 (100%)	64/68 (94%) ^b 56/70 (80%)	60/67 (90%) ^b 55/70 (79%)

^a Singleton false-positive PRRSV qRT-PCR reaction.

^b Statistically significant difference using a comparison based on matched oral fluids and serum samples (McNemar's test, p<0.05)

Products Licensed for Food Producing Animals that may Decrease Stress or Pain Associated with Specific Diseases or Procedures

Cameron Harris, Summer Experience Student, Veterinary Science and Policy Unit, OMAFRA, Dr. Trisha Dowling, DVM, MSc, DACVIM (LAIM) & DACVCP, Professor, Veterinary Clinical Pharmacology, Western College of Veterinary Medicine and Tim Blackwell, Veterinary Science and Policy Unit, OMAFRA

Introduction

Studies have shown that reducing the pain and discomfort of animals shortens healing time and increases appetite. When used effectively, drugs that reduce pain or discomfort can increase profits on farms. As the use of such drugs becomes more prominent in food-producing animals, it is important to know which drugs are approved for food-producing animals and their associated warnings or contra-indications. Drugs that help the well-being of the animal are a simple way to improve their comfort level and production; however, drugs should never be used to cover up an underlying problem.

From Dr. Dowling:

The practice of good veterinary medicine includes administration of drugs to control pain and inflammation. This goal is often complicated in food animal practice by the lack of veterinary drugs specifically approved for such uses. Inconsistencies in the Canadian labelling of NSAID, glucocorticoid and barbiturate products also add to the confusion.

Pain control is accomplished by using drugs that are analgesic and/or anti-inflammatory. Not all analgesic drugs are anti-inflammatory (e.g., opioids, local anesthetics). Drugs such as the non-steroidal anti-inflammatory drugs (NSAIDs) and glucocorticoids are traditionally considered anti-inflammatory by virtue of blockade of the arachidonic acid pathway of prostaglandin and leukotriene synthesis. But these drugs can also be analgesic from central mechanisms that don't involve their anti-inflammatory effects. For example, in a sheep model, the non-steroidal anti-inflammatory drug (NSAID) flunixin meglumine was analgesic even without the presence of inflammation and the analgesic effect was reversed with naloxone, the opioid antagonist. ⁽¹⁾

(Continued on page 12)

For the anti-inflammatory drugs, it is important to understand that they are more effective as analgesics when given prior to the onset of the inflammatory processes or insult. If inflammation is already established, the NSAIDs will only block further prostaglandin production but have no effect on the inflammatory mediators already present. The time to onset and duration of the central analgesic properties of NSAIDs does not correlate well with their peripheral anti-inflammatory effects. The central analgesic effect has a more rapid onset and shorter duration of action than the anti-inflammatory action. So it is very important to understand the goal of therapy in food animal patients as the drug, the dosage and the dosage regimen may need to be different for analgesia (e.g., surgical-induced pain) than for controlling inflammation (e.g., chronic musculoskeletal disease).

The food animal labelling for the NSAIDs for pain control is inconsistent due to the original evidence provided to the Veterinary Drugs Directorate to support the label claims. Models of pain and inflammation in food animals have only recently become validated, so older product claims may not specify “analgesia” even though it is now well substantiated that the drug does relieve pain (e.g., flunixin meglumine is only labelled for control of pyrexia and inflammation associated with endotoxemia).⁽²⁾ The labelling for glucocorticoid products is also inconsistent; most are labelled as “anti-inflammatory” for musculoskeletal disorders which would presume pain relief from reduction of inflammation.

A further complication to treating pain in food animals is determining the appropriate meat and milk withdrawal times. For some products, the labelling is quite clear. For example, the flunixin meglumine brands Banamine and Flunazine have been approved for beef and lactating dairy cattle with a 6-day meat withdrawal time and a 36-hr milk withdrawal time when given at 1.1 mg/kg IV. Ketoprofen (Anafen) is also approved for beef and lactating dairy cattle with a 24-hour meat withdrawal time but there is nothing specifically mentioned on the label regarding a milk withdrawal time. However, Anafen is advertised as not requiring a milk withdrawal time. Human safety of ketoprofen is not a serious concern as it is approved in human formulations. Also, as an

NSAID, it does not readily cross the blood-mammary gland barrier so that, even with a zero milk withdrawal, milk concentrations do not exceed the maximum residue limit (MRL) of 0.05 ppm.

The lack of a specific meat or milk withdrawal time on the label does not always mean that it is safe to assume that it is “zero”. This is the situation for aspirin products and the old glucocorticoid formulations of dexamethasone and flumethasone. Aspirin (available as acetylsalicylic acid boluses) is another example of an NSAID that is approved for pain control in cattle but is silent on meat and milk withdrawal times. There are no MRLs for aspirin in meat or milk and, because of the association with Reye’s Syndrome in children, the CgFARAD follows the US FARAD’s policy of recommending 24-hr meat and milk withdrawal intervals.⁽³⁾

The situation with the approved glucocorticoid products is very confusing. Prednisolone acetate formulations are approved for use in beef and dairy cattle and have label meat and milk withdrawal times. The approved labelling for dexamethasone does not indicate meat and milk withdrawal times and the flumethasone labelling has a meat withdrawal time but not a milk withdrawal time. Yet both products are labelled for treating ketosis, which is a disease process exclusive to lactating dairy cattle. Furthermore, MRLs have not been established for either drug in milk and scientific studies have documented that toxicologically significant residues are detectable in the milk during the first 2-3 days after intramuscular injection.⁽⁴⁾

The use of glucocorticoids in food animals is of great concern in the European Union; these drugs are sometimes administered in combination with beta2-agonists (e.g., clenbuterol) to enhance their repartitioning effects. Chronic administration of beta2-agonists down regulates the beta receptors. Concurrent administration of glucocorticoids restores the effect of the beta2-agonists, so detection of glucocorticoids is considered an indicator of illicit beta2-agonist use. Glucocorticoids may affect meat quality by increasing water content.⁽⁵⁾

(Continued on page 13)

Unfortunately, good depletion studies for dexamethasone in meat or milk and flumethasone in milk have not been performed. For these reasons, CgFARAD can only make very conservative withdrawal recommendations and has expressed concerns about this issue to the beef and dairy commodity groups. Another example of a residue concern to the CgFARAD is the labelling on thiopental (Thiotal), which is approved as a general anesthetic in cattle, sheep and swine with no label withdrawal time. As an “ultrashort acting” barbiturate anesthetic, thiopental is short-acting not because of elimination, but rather because it redistributes into body tissues, especially adipose tissue. There are no MRLs for thiopental in food animals and there is a scarcity of depletion data, but it is known to accumulate in tissues of cattle, sheep and swine with the highest concentrations in fat. (6) Thiopental was approved a very long time ago and would not be approved today without complete residue depletion profiles, MRLs and withdrawal times. Because of the lack of depletion and human safety data, the CgFARAD is unable to provide any withdrawal guidance for this drug whether used on-label or in an extra-label manner in any food animal species.

1. Chambers JP, Waterman AE, Livingston A. The effects of opioid and alpha 2 adrenergic blockade on non-steroidal anti-inflammatory drug analgesia in sheep. *J Vet Pharmacol Ther* 1995; 18(3):161-166.
2. Currah JM, Hendrick SH, Stookey JM. The behavioral assessment and alleviation of pain associated with castration in beef calves treated with flunixin meglumine and caudal lidocaine epidural anesthesia with epinephrine. *Can Vet J* 2009; 50(4):375-382.
3. Damian P, Craigmill AL, Riviere JE. Extra-label use of nonsteroidal anti-inflammatory drugs. *J Am Vet Med Assoc* 1997; 211(7):860-861.
4. Reding J, Sahin A, Schlatter J, Naegeli H. Dexamethasone and flumethasone residues in milk of intramuscularly dosed cows. *J Vet Pharmacol Ther* 1997; 20(3):198-203.
5. Odore R, Badino P, Pagliasso S, Nebbia C, Cuniberti B, Barbero R, et al. Changes in lymphocyte glucocorticoid and beta-adrenergic receptors in veal calves treated with clenbuterol and steroid hormones for growth-promoting purposes. *J Vet Pharmacol Ther* 2006; 29(2):91-97.
6. Sharma RP, Stove CM, Good AL. Studies on the distribution and metabolism of thiopental in cattle, sheep, goats and swine. *J Pharmacol Exp Ther* 1970; 172(1):128-137.

Equine Neurological Disease: Surveillance Update

Kathy Zurbrigg, Veterinary Science and Policy Unit, OMAFRA

Veterinarians are reminded that laboratory-confirmed cases of West Nile virus (WNV), Eastern Equine Encephalitis (EEE), Rabies and Equine Herpes Virus (EHV1-Neuropathic strain) in Ontario are posted by county at www.omafra.gov.on.ca/english/livestock/horses/facts/nhd_surv2010.htm

To date, there have been three reported cases of EEE (2 in Simcoe County and 1 in Bruce County) and zero cases of the other listed viral neurological diseases.

Factsheets are available on the OMAFRA website.

Equine Viral Encephalitis—
www.omafra.gov.on.ca/english/livestock/horses/facts/info_equv.htm

Controlling Mosquitoes on Horse Farms and Rural Properties—
www.omafra.gov.on.ca/english/livestock/horses/facts/info_mosq.htm

The Public Health Agency of Canada reports a total of 355 dead birds have been tested by the Canadian Cooperative Wildlife Health Centre [British Columbia (228), Saskatchewan (6), Manitoba (2), Ontario (117) and Quebec (2)].

Twenty-two dead birds positive for WNV have been reported since the start of the season [British Columbia (5), Saskatchewan (1) and Ontario (16)]. As of week 42 (October 17-23), eighty-five (85) mosquito pools positive for WNV have been reported in Canada [Saskatchewan (9), Manitoba (20) and Ontario (56)].

An Update on Milk Intake by Calves Using an Automated Feeder

Neil Anderson, Veterinary Science and Policy Unit, OMAFRA

The April 2010 issue of **Ceptor** reported milk intakes for 90 calves using an automated calf feeder at an Ontario dairy farm ⁽¹⁾. It's appropriate to give you an update now that there are 155 calves in the database at the end of a full year. The data have been so useful to the owners and their employees that they are continuing to keep the manual records. I hope that you find the revelations useful to you.

First, here's an update on the feeding history. Following the sickness and deaths of a few calves prior to September 2009, the automatic feeder was re-programmed to deliver 8 L/day immediately upon entry, and a mixture of 150 g/L using a 20P:15F milk replacer. Calibration has been checked weekly or biweekly. In May 2010, the programming was changed to allow 12 L/d upon entry. Some of the early data alerted us to more treatments for 'coughs' in calves that had been intubated to achieve the dogmatic goal of 4 L of colostrum at first feeding. Testing showed no remarkable difference in serum protein levels in the calves fed 4 L vs. 3 L or less. Subsequently, there was a management change in colostrum protocols with 3 L by suckling being the new target. Since April 1, 2010, all of 57 heifer calves received maternal colostrum, 68% by nipple bottle, and 77% received three litres or less.

Amongst the 57 calves, there was one death. A 13-day-old calf was euthanized because of an infected joint and non-response to treatment. Fully 75% of calves were introduced to the feeder by three days of age and the eldest at five days. The herdsman reported a dramatic decrease in coughs and treatments, which may be related to intubation of fewer calves or to the summer season. Fall and winter data will be needed to assess this clinical impression.

Percentiles (quartiles) were used to group the calves into four groups from the lowest to highest 25-percent, according to milk replacer intakes, as shown in **Figure 1**. The specific range of intakes for 4, 5, 7, and 10-day-old calves in the four groups appears in **Table 1**. For example, for 7-day-old calves, the 25th, 50th, and 75th percentiles drank 5, 6 and 8 L/d, respectively, with a maximum of 12 L. For the 4-day-old calves, in Table 1, the lowest 25-percent consumed 4 L or less but 75% consumed greater than 4 L, with 50% consuming greater than 6 L and the highest 25% consuming 7.7 to 12 L/d. At 7 days of age, 25% of calves consumed equal to or less than 5 L/d but 75% consumed greater than 5 L, with 50% consuming greater than 6 L, and the highest 25% consuming 8.1 to 12 L/d. **Figure 2**

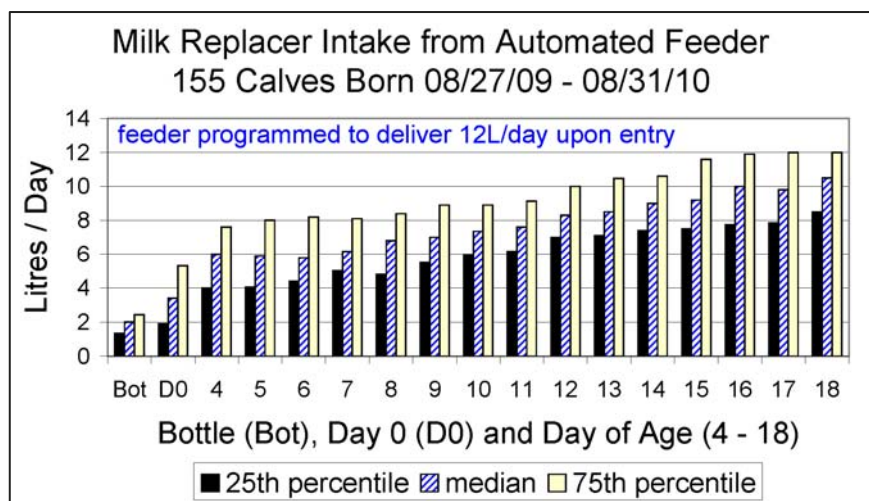


Figure 1. Percentiles (25th, 50th and 75th) of milk replacer intake (Litres/day) for 155 calves during the bottle feeding stage (Bot), day of introduction (D0) and day 4-18 of age.

(Continued on page 15)

and 3 illustrate the daily intakes for five and seven-day-old calves using histograms and a normal distribution curve.

Often, automated feeders are programmed to deliver 4-5 L/d upon entry, to increase daily allocations over 10-14 days to attain 6 to 8 L/d, and calves are often entered when seven days of age or older. From the data, about 75% of our study-farm calves could not have met their wants for milk or would have been hungry if the feeder had been programmed for 4-5 L/d upon entry. Clearly, our on-farm-study calves consumed more at a younger age than conventional programming of automated feeders would allow. Certainly, it is becoming more common to find some feeders programmed to deliver 8 L/d after an introductory period of 5 L and some are set to deliver 8 L/d upon entry.

At our study farm, the owners successfully enter calves onto the feeder as soon as possible after colostrum feeding and they program the feeder so the majority of calves meet their needs for milk replacer. They now consider calf growth and health to be excellent so that's where the programming will probably stay. They are gaining full labour-saving advantages with the feeder and their calves are benefiting from suckling to meet their needs, almost like nature's way. Without a doubt, it makes sense to prevent hunger and to feed a calf to meet its potential. Across Ontario, many producers have adopted enhanced-feeding by conventional means or with automated feeders. It is a blessing for the calves in their care.

1. Anderson N. Milk Intake for Calves Using an Automatic Feeder. *Ceptor Animal Health News*. 2010; 18 (1):6-7.

Table 1. Daily Milk Replacer Intakes at Selected Ages
Calves Divided into Four Groups from Lowest to Highest 25-Percent (percentiles)

Age	Four Groups from Lowest to Highest 25-Percent (percentiles)			
	Lowest	Second	Third	Highest
4 days	≤4.0L/d	4.1 - 6.0L/d	6.1 - 7.6L/d	7.7 - 12L/d
5 days	≤4.0L/d	4.1 - 5.9L/d	6.0 - 8.0L/d	8.1 - 12L/d
7 days	≤5.0L/d	5.1 - 6.0L/d	6.1 - 8.0L/d	8.1 - 12L/d
10 days	≤5.9L/d	6.0 - 7.4L/d	7.5 - 8.9L/d	9.0 - 12L/d

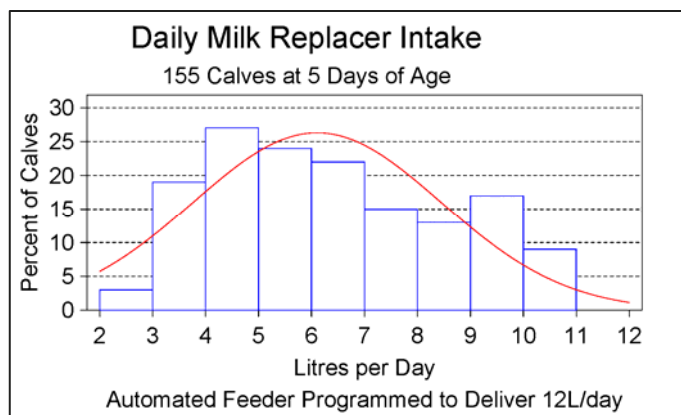


Figure 2. Histogram showing the distribution of milk replacer intake for 5-day-old calves using an automated feeder.

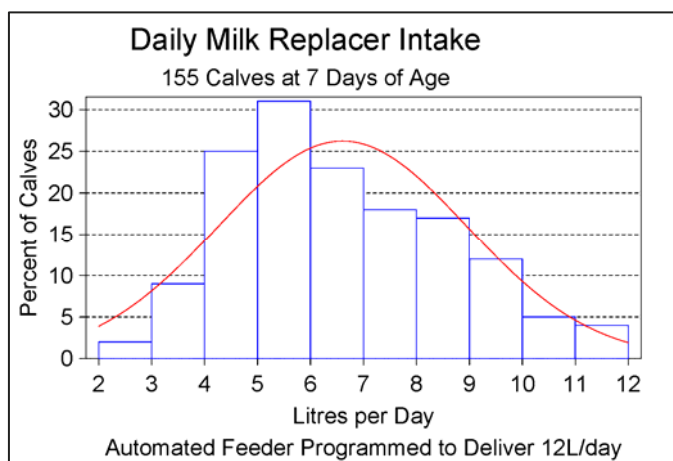


Figure 3. Histogram showing the distribution of milk replacer intake for 7-day-old calves using an automated feeder.

Evaluating an Evaporative Cooling System in a Tie-Stall Dairy Barn

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

This year's hot summer provided ideal conditions to assess a new evaporative cooling system in a St. Jacob's area dairy barn. The barn housed cows in two rows of tail-to-tail tie stalls and heifers in a section of bedded-pack pens. The cooling wall was installed above the stone wall of the typical Ontario bank barn. The system and the tunnel ventilation operated continuously each day. Here's what we found during a hot and humid spell in July this summer.

Hobo® Data Loggers captured temperature and relative humidity data continuously for 120 hours at a shaded location outside the barn (#2 in Figure 1) and five locations inside the barn (#1, 3, 4, 5 and 6 in Figure 1). Averages of hourly recordings at the inside locations were used to generate the data set. The formula used to calculate the Temperature Humidity Index (THI) for this report was described by Hahn ⁽¹⁾, where $THI = 0.81 \text{ tdb} + RH (\text{tdb} - 14.4) + 46.4$, and $\text{tdb} = \text{dry bulb temperature, } ^\circ\text{C}$, and $RH = \text{relative humidity in decimal form}$. Scientists suggest the onset of heat stress for dairy cattle starts at 22°C (72°F) at 100% RH and 25°C (77°F) at 50% RH. Dairy cows experience mild heat stress at $THI > 72$ and moderate heat stress when $THI > 80$. ⁽²⁾

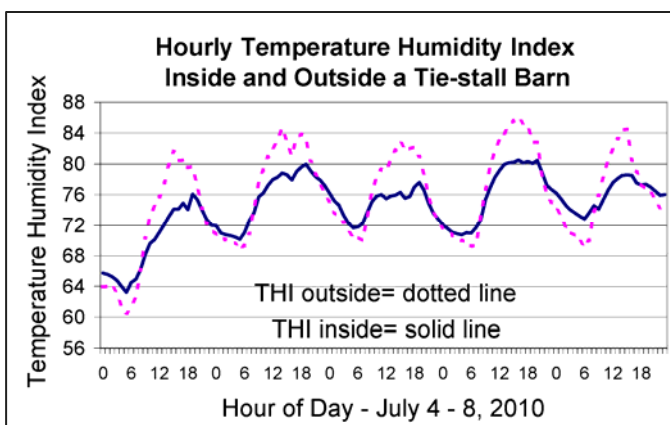


Figure 2. Hourly Temperature Humidity Index (THI) inside and outside the barn. (0 = midnight)

Figure 2 shows the hourly THI inside and outside the tie-stall barn. The THI followed a cyclic pattern

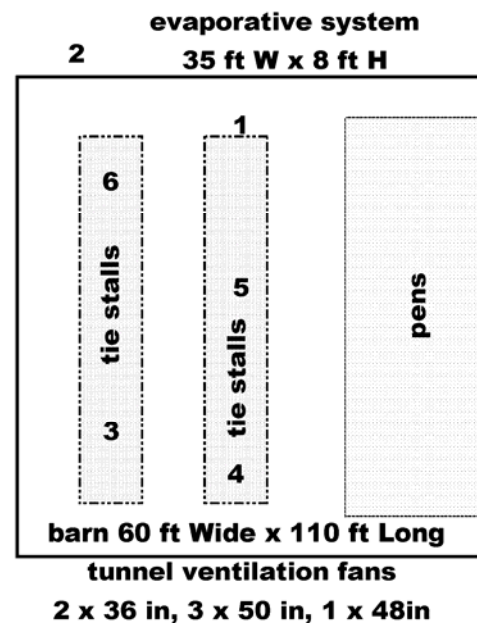


Figure 1. Floor plan of the barn and the location of the data loggers.

associated with day and night hours. In general, THI inside the barn was lower than outside during mid-morning to evening hours. During the 120 hours of observation, there were 92 hours with $THI \geq 72$ inside the barn and 83 hours with $THI \geq 72$ outside the barn. The coolest hours occurred between about midnight to 6:00 a.m. with little difference between outdoor THI and inside THI during these hours.

Figure 3 shows the differences in THI between indoors and outdoors in the tie-stall dairy barn during July 4-8, 2010. The difference equals inside THI minus outside THI. The scale has positive and negative values. Positive values indicate that the indoor THI was higher (warmer) than outdoors. Negative values indicate the indoor THI was lower (cooler) than outside. During 92 hours with $THI \geq 72$ inside the barn, 58 hourly intervals were cooler than outside. When THI outside the barn was ≥ 72 , THI inside the barn averaged 2.5 less than outside ($T = -8.6$, $p = 0.0001$), 95% Conf Inter = -3.1 to -1.9).

(Continued on page 17)

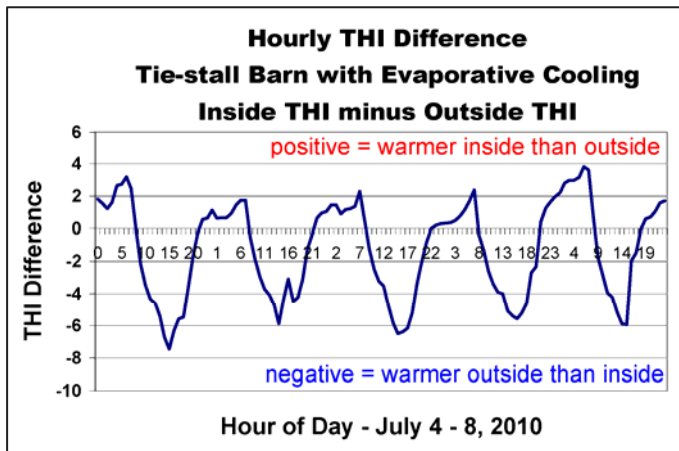


Figure 3. Hourly THI differences (inside minus outside) during July 4 to 8, 2010. (0 = midnight)

The owner reported that the cooling system used about 67 imperial gallons of water per day. In addition, he said that he noticed and enjoyed the

cool working conditions. His cows maintained production at 33 kg/cow/day throughout the summer.

Acknowledgement: The data for this report were made possible by a naturally curious and generous St. Jacob's area producer who provided access to his farm. We thank him for making this study possible. Advanced Dairy Systems, Wellesley, Ontario, graciously provided a water meter.

1. Habn GL, et al. *Dynamic responses of cattle to thermal heat loads.* *J. Anim. Sci.* 1999; *Suppl. 2*, 77:10-20. / *J. Dairy Sci.* 1999; *Suppl. 2*, 82:10-20.
2. West JW. *Effects of heat-stress on production in dairy cattle.* *J. Dairy Sci.* 2003; 86:2131-2144.

The Ontario Farm-call Surveillance Project (OFSP): Advantages of an Active Surveillance Program

Kathy Zurbrigg, Veterinary Science and Policy Unit, OMAFRA

The Ontario Farm-call Surveillance Project (OFSP) is an OMAFRA pilot project to investigate alternative methods to collect and monitor data on livestock disease in the province. The project began in April 2009 and currently has 21 clinics participating across Ontario. The project utilizes pre-diagnostic health data to rapidly detect an outbreak of disease. This approach is referred to as syndromic surveillance. Participating veterinarians record the clinical signs they observe on farm calls and submit their data on a weekly basis. This information is analysed for geographic and temporal trends. Participating veterinarians submit samples to the Animal Health Laboratory (AHL), with all charges for the laboratory fees being accrued to the OFSP's AHL account.

The OFSP provides more information in a timely manner for monitoring disease beyond that routinely available with laboratory submissions.

The OFSP provides additional information in the following areas:

Syndromic Prevalence

While laboratory test results or submissions can be monitored for temporal trends, it is more difficult to

look for trends in syndromes not tied to a single etiology, using laboratory data. For example, monitoring for an outbreak of calf diarrhea would require the inclusion of all laboratory submissions where any test for a cause of calf diarrhea is done, and for the data to be assessed for greater than expected counts of submissions for calf diarrhea. However, a veterinarian will frequently visit a farm to investigate calf diarrhea but that visit may not always result in sample submission to a laboratory. By capturing the clinical investigation in the OFSP, rather than relying solely on laboratory submissions, information is gained about calf diarrhea rates.

Enhancing the Quantity and Type of Submissions to the AHL

When producers must pay for diagnostic testing, the number of samples submitted to the laboratory is affected by:

1. The economic status of the industry
2. The perception of the value of diagnostic testing by the producer
3. The perception of the value of diagnostic testing by the veterinarian
4. The costs of the tests

(Continued on page 18)

The first two factors may trump the third. The OFSP permits participating veterinarians to obtain diagnostics they feel are important and may result in the submission of samples that would not normally be submitted.

OFSP laboratory submissions accounted for 3.5% (937 / 27021) of the total large animal submissions to the AHL from April 2009 to September 2010. OFSP histology and necropsy submissions accounted for 6.3% (234 / 3712) of total histology and necropsy submissions from April 2009 to September 2010.

Over the same time period veterinarians participating in OFSP sent in samples charged to the project's AHL account an average of 8.5% of the time they completed a "disease-related" farm call.

Occasionally the diagnosis of the cause of a livestock disease outbreak requires multiple samples or carcasses to be tested before a definitive diagnosis can be made by the laboratory. If initial submissions fail to produce a diagnosis, producers and veterinarians may not send in additional samples. Having the ability to request diagnostic testing and charge it to the OFSP's AHL account may lessen this reluctance. The submission of multiple samples increases the chance of an accurate diagnosis.

Public Health

Numerous submissions to the laboratory through the OFSP are from livestock infections that have zoonotic potential. Supported with confirmation by laboratory work, veterinarians are able to warn their clients of the potential public health risk. Some of these cases might not have reached the laboratory otherwise. Specific examples of zoonoses confirmed by AHL have included:

- two cases of EEE reported in Ontario in 2009;
- Numerous cases of cryptosporidiosis in calves;
- Botulism in a dairy herd;
- *Coxiella burnetii* (Q Fever) in a goat herd and
- *Salmonella typhimurium* in veal calves.

Strengthening Farm Veterinary Practice

Veterinarians participating in the OFSP report that providing free diagnostic testing to their clients has strengthened their relationship. Several veterinarians

have also stated that participating in the OFSP has allowed them to provide better education and training to veterinary students and foreign-trained veterinarians in test selection, sampling techniques, interpretation and application of test results and better development of treatment strategies. By creating a more interesting student externship experience, the OFSP may encourage students to consider large animal practice.

Laboratory diagnosis may change the direction of an on-farm disease investigation and highlight management lapses. For example, in two separate situations, practitioners submitted samples from cases of cattle enteritis. In both, the diagnoses were Bovine Viral Diarrhea (BVD). The submitting veterinarians had assumed both producers were vaccinating for BVD but, in both cases, the herd owners had ceased to do this. For these veterinarians, it emphasized the need to routinely review preventative health protocols and demonstrated to the producer the importance of following these protocols.

Enhancing Animal Welfare

One participating veterinarian has stated that the OFSP has promoted good animal welfare. It can be difficult for producers and farm employees to euthanize animals in a timely manner, resulting in animals with a poor prognosis languishing in sick pens. When a non-curable condition can conclusively be confirmed by a laboratory submission, this veterinarian reports seeing cases where animals were euthanized at an earlier stage of the condition as the inevitable outcome was predictable (e.g., Johne's Disease in sheep).

Currently OMAFRA and most other jurisdictions rely on passive surveillance of laboratory data to monitor livestock disease. These data are easily obtained; however, the quality and quantity of information is highly dependant on a producer's belief that testing is warranted as well as their willingness to pay. The OFSP, by providing active surveillance data for analysis of syndromic prevalence and geospatial distribution, has the potential to improve reporting on public health risks and strengthen farm veterinary practice.

Lack of Tetracycline Residues with Two Different Methods of Topical Oxytetracycline Treatment for Digital Dermatitis

Gerard Cramer, Cramer Mobile Veterinary Services, Stratford, Ontario, Janet Higginson, PhD candidate, Ontario Veterinary College, and Ryan Tenbergen, Summer Experience Student, Veterinary Science and Policy Unit, OMAFRA

The use of tetracycline hydrochloride in either powder or liquid form is a commonly recommended treatment for clinical cases of Digital Dermatitis. However, no studies have evaluated whether violative tetracycline residues are present in milk after the topical application of tetracycline in a powder form. The objective of this study was to evaluate milk for violative tetracycline residues following treatment of cows for clinical digital dermatitis with two tetracycline treatments.

A convenience sample of 19 cows was selected during a single week, from a larger study evaluating two different treatments for therapeutic efficacy. Selected cows were randomly allocated to the different treatments. Seven cows were enrolled in the paste treatment (tetracycline hydrochloride 1000 mg/g, propylene glycol and vinegar, mixed as a 1:1:1 ratio); six cows in the wrap treatment (tetracycline hydrochloride powder and Vetwrap); two cows received both treatments; and four cows were selected as untreated controls.

Composite milk samples were collected from each cow at the time of treatment (day 0) and prior to the evening milking on days one and three following

treatment. The 19 samples were tested for tetracycline residues using the IDEXX SNAP Tetracycline test, a test reported to detect tetracycline hydrochloride residues at 50 ppb.

No cows tested positive at either day 1 or day 3. One cow had a positive test result on the day 0 sample (prior to treatment). Subsequent samples on this cow were negative.

Topical treatment, with tetracycline paste alone or tetracycline powder and wrap, did not result in detectable tetracycline residues in milk when tested with a commercially available tetracycline residue test. Based on these results, no withdrawal period is recommended when using these two treatments.

Veterinarians recommending and using this extra-label treatment for Digital Dermatitis should continue to warn producers of the need to ensure contamination of the milk from skin surfaces does not occur with any topical antibiotic preparation. Enhanced testing for tetracycline residues, using tests with lower detection levels, are now in place in Ontario.

Testing for Antibiotics in Bovine Milk

Ann Godkin, Veterinary Science and Policy Unit, OMAFRA, and Mark Mitchell, Laboratory Services Division, University of Guelph

Changes to the regulatory milk testing program for antibiotics has triggered renewed interest in antibiotic test kits that can be used in veterinary practices or on farms. Producers are required to have a veterinarian prescribe drugs that are, or will be, used in an extra-label manner. Veterinarians need to have accurate withdrawal times for such antibiotic prescriptions or be able to recommend appropriate tests to detect violative antibiotic residues. Test kits need to be able to detect the correct antibiotic at a level very close to the Canadian maximum residue level (MRL) or administrative MRL (aMRL). Until recently, many classes of

antibiotics could not easily be confirmed at levels as low as the MRLs or aMRLs by regulatory testing but, for tetracycline antibiotics and sulfa family antimicrobials, this has changed.

To assist veterinarians in recommending an appropriate test for an antibiotic used in an extra-label prescription, Mark Mitchell of the Laboratory Services Division, University of Guelph, has provided the following table. The table lists detection levels for some of the newer antibiotic test

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Table 1. Comparison of Antibiotic Test Kits Used in Ontario (September 2010)

Test Kit (detection units are ppb)	AMX*	AMP	CEPH	CFT	CLX	PEN	SMZ	SDM	SDX	All other sulfa's	OXYT	CHLT	TET	Time to run test (mins)
Charm ROSA (Rapid One Step Assay) (Lateral flow immunoassay)														
SL5 Beta-Lactam Test	5.6	8.5	13.7	77	50	3.6								8
SL6 Beta-Lactam Test	7.1	9.6	18.7	72	8.3	4.2								8
SL3 Beta-Lactam Test	7.8	8.7	16	51	100	4.2								3
Sulfamethazine and Sulfadimethoxine Test							6.2	6.7						8
Sulfa Test							6	1	30	1-30				8
Tetracycline											70	70	15	8
MRL Beta-Lactam and Tetracycline	3	3	6	60	30	3					70	70	15	8
Charm CowSide II (Microbial Inhibition)	3	3	8	50	10-25	3	75-125	25-50			75-100		50-100	180
IDEXX SNAP (Enzyme-linked receptor binding assay)														
Tetracycline											50	100	50	9
Sulfamethazine							10							9
Beta-Lactam	7.3	5.8	11.7	12	50	3								9
Delvotest SP-NT (Microbial inhibition)	3-5	6-7	6-8	50-100	20-30	2-3	100-250				800		800	180
Canadian MRL or aMRL for milk	NP	10	20	100	30	6	10	10	10	10	100	100	100	

NP stands for Not Published

*AMX Amoxicillin
AMP Ampicillin
CEPH Cephalirin

CFT Ceftiofur
CLX Cloxacillin
PEN Penicillin G

SMZ Sulfamethazine
SDM Sulfadimethoxine
SDX Sulfadoxine

OXYT Oxytetracycline
CHLT Chlorotetracycline
TET Tetracycline

kits. For tests not listed, the detection levels can be found in the product inserts. The newer “families” of tests rely on techniques that detect very specific compounds, in comparison to older microbial inhibition tests, which report the detection of a broader range of antibiotics, but many are not identified at levels sufficiently close to the MRLs or aMRLs.

The MRLs reported in Table 1 are Canadian MRLs. When referring to test documentation or literature about tests, be sure that the MRLs the test detection levels are compared to are at Canadian levels. Depending on where the kits are manufactured, often either American or European Union MRLs are

shown, which can be different than those used in Canada. A complete published list of Canadian MRLs can be found on the Veterinary Drugs Directorate (VDD), Health Canada website at www.hc-sc.gc.ca/dhp-mps/vet/mrl-lmr/mrl-lmr_versus_new-nouveau-eng.php

Note too that no test for sulfadoxine (one of the active ingredients in many trimethoprim-sulfa products) with a detection level at the Canadian MRL is listed in Table 1. Test kits that report testing for “sulfas” singly or in various combinations, often detect different compounds at different levels. It may not be safe to extrapolate to compounds not specifically named in the test kit documentation.

Veterinary Practitioners – A Role in Canadian Quality Milk Delivery in Ontario

Ann Godkin (on behalf of the Ontario Association of Bovine Practitioners Board) and Alex Hamilton, Dairy Farmers of Ontario, Canadian Quality Milk Contact

It has been mandated by Dairy Farmers of Canada (DFC) that all Canadian dairy producers become registered in the Canadian Quality Milk (CQM) program. Details about the program and producer materials are on the DFC website at www.dairyfarmers.ca/what-we-do/programs/canadian-quality-milk (under “documents and more information” on the sidebar).

In Ontario, the Dairy Farmers of Ontario (DFO) are delivering the program for Ontario’s dairy producers and have received some funds to help them do so. The goal is to have all Ontario producers registered with CQM by early 2015. In Ontario, about 25% of producers will be asked to register, prepare and become validated in CQM in each of the programs four years. Late fall 2010 has been set as the program start date, pending regulatory changes. Once each producer has received their individual “start date” for CQM, they have the option (it is not mandatory) to become trained (seek assistance to get ready) with an approved CQM Advisor.

The Ontario Association of Bovine Practitioners (OABP) Board of Directors and DFO have developed a program to train veterinary practitioners to become approved CQM Advisors. The OABP Board and DFO representatives drafted a memorandum of understanding (MOU) of how the two organizations will work together. This MOU describes the options producers can pursue to get CQM training. The MOU is posted at www.oabp.ca/CQM/CQM_Info.htm. In addition, DFO will train non-DVM Advisors to assist producers.

Veterinary practitioners have already become approved CQM Advisors by participating in the Advisor training offered in October 2010. Instruction was provided by an OABP veterinary practitioner with CQM experience, Dr. Kelly Barratt, and by DFO staff. Additional Advisor training opportunities will be offered periodically.

Risk Factors Associated with a Positive Test for Paratuberculosis Using the Milk ELISA in Ontario and Western Canadian Dairy Herds

Ulrike Sorge, Kerry Lissemore and David Kelton, Department of Population Medicine, Ontario Veterinary College, University of Guelph, Scott Wells, Centre for Animal Health and Food Safety, College of Veterinary Medicine, University of Minnesota Steven Hendrick, Department of Large Animal Clinical Sciences, Western College Veterinary Medicine, University of Saskatchewan Ann Godkin, Veterinary Science and Policy Unit, OMAFRA

Paratuberculosis is a chronic, mostly subclinical disease of ruminants that can lead to severe economic losses on infected dairy farms. Risk assessment (RA)-based paratuberculosis control programs use the recommendations for targeted modifications to on-farm management to prevent new infections on farm. However, many frequently recommended management practices have not been evaluated in longitudinal field studies. Therefore, in support of the Canadian and Ontario Johne's dairy farm initiatives, a study was conducted to identify risk factors associated with the:

1. Paratuberculosis status of the herds (positive vs. negative, based on cow testing) and the
2. Proportion of cows in the herd with positive tests (within-herd prevalence).

Between 2005 and 2007, a pre-visit survey, risk assessment (RA) and a MAP milk ELISA of all lactating cows were conducted in each of 226 dairy herds in Ontario and Western Canada. In 2008 to 2009, these herds were re-tested with the same MAP milk ELISA. A herd was classified as test-positive if it had one or more test-positive cows. A logistic regression model and a negative binomial model were used to identify risk factors associated with the herd's ELISA-status (test-positive vs. test-negative) and the number of MAP milk ELISA-positive cows within a herd in 2008-2009, respectively.

Risk factors for being both a test-positive herd and for having an increasing number of test-positive

cows, included:

- the presence of ELISA-positive cows on the first herd test (2005 to 2007),
- the number of clinical Johne's Disease (JD) cows in the 12 months prior to the first RA,
- the introduction of cows from unknown JD status herds, and
- the feeding of pooled colostrum.

In addition, a herd was more likely to be test-positive (Odds ratio: 1.06, $P = 0.038$) when owners reported a higher number of calves with diarrhea on the pre-visit survey.

The feeding of monensin sodium to certain age groups was associated with a decrease in the prevalence of MAP ELISA-positive cows on farm. Herds feeding monensin sodium only to cows had 2.3 times greater prevalence compared to farms that fed it to heifers and calves only, in pair-wise comparison ($P = 0.0185$).

The results of this study indicated that increasing the risk of calves being exposed to MAP through certain management practices, increased the likelihood of a herd having at least one test-positive cow.

Findings of this study have been incorporated into the 'Animal Health and Johne's Disease Risk Assessment and Management Plan (RAMP)' used in the Ontario Johne's Program for dairy herds.

Johne's Risk Assessment and Management Plans in Practice: 28 Evaluations Done and Counting

Heather L. Aitken DVM, Rideau-St. Lawrence Veterinary Services

At our practice here in eastern Ontario, we have a total of nine large animal veterinarians, of whom five have regular herd health clients. When the Johne's program was announced, we made the decision that, to ensure consistency and efficiency, we would assign one veterinarian to be responsible for conducting the Risk Assessment and Management Plans (RAMPs) on our clients' farms.

We have four different testing periods within our practice area, with our largest coming up this fall. Two testing windows have already been completed and 80% of farms have completed the RAMP to this point. Those that have not completed the RAMP are not on DHI and will be reminded again this fall that their appointments are due.

We wanted to make the cost of the RAMP portion of the program consistent and, understanding that producers would likely want to include the RAMP in their regular herd health program, made this slightly challenging. Our approach was to determine a set fee that included a call fee and a specific length of time to do the RAMP. To this point, most RAMP's are very consistent in the time it takes to complete them, no matter how large the farm. This system has worked well because there is no difference in cost based on whether a veterinarian is there for a separate RAMP visit vs. including it in herd health.

Because this is a new program, I often hear grumbling from producers. Therefore, at the beginning of every visit, I try to stress the importance of calf health in general, rather than the fact that this is a Johne's program. I am a great believer that a good understanding of the problem

will result in better compliance with the solution. I am always surprised by the lack of information and knowledge out there regarding Johne's disease. I try to give a brief description of the disease, as well as explain in detail why we perform the assessment the way we do (i.e., why we start in the calving pen and work our way up to older animals). I'll ask the farmer to show me the bottles they use to feed newborn calves to confirm the amount of colostrum they feed and to check for general cleanliness of the bottles. If the producer is having a calf scour issue, then scratching the inside of the bottles can lead to a good teachable moment for an interesting discussion on bottle washing techniques.

In our area there are a large number of tie-stall barns and RAMP answers can be very different, depending on the season in which the assessment happens to be done. Pasture still plays a large role on certain farms and "Dr. Grass" always has to be considered when doing the assessment. I find that using the "worst case scenario" to look for risks is helpful in these circumstances.

Our practice has found the RAMPs to be a relatively easy sell to our clients when we use the "calf herd health" approach. Not all producers are willing but, for those that are, I feel that doing the RAMPS has been a good lead into discussions useful to them about hygiene, maternity pen management, calf feeding and general disease prevention. After 28 RAMPs, I'm becoming quite good at drilling down to find out what they really do and finding ways we in our practice can help them improve overall calf and herd health.

The Ontario Johne's Program – Participation as of September 2010

Nicole Perkins, Ontario Johne's Program Co-ordinator and Ann Godkin, Veterinary Science and Policy Unit, OMAFRA.

The Ontario Johne's program was launched in January 2010. As of mid-September 2010, six testing "windows" of 100 to 150 producers each, have been eligible for the subsidized testing component. Participation and testing numbers have been high.

So far, only 0.9% of all cows tested, using either blood or milk, have had a positive or HT test result. Only 53 cows, originating from 35 herds, have had a result 1.0 or higher making them "high titre (HT)" cows. HT cows are shedding MAP bacteria in their manure. It's important to find these cows and eliminate them by rendering, composting or burial to stop the spread of infection. It's good to see that only 6% of herds tested have had a HT cow.

Total # of Herds Tested	544
Total # of RAMPS completed (Sept 2010)	417
Total # of cows classified as "High Titre (HT)"	53 (1.0 or higher on either milk or serum ELISA)
Number of herds with at least 1 HT test result	35
Number of herds with more than 1 HT result.....	9
Total # of cows tested by CanWest DHI (milk ELISA)	37,692
Total # of cows tested by AHL (serum ELISA).....	573
Total # of cows tested within the program	38,265

Available Resources

Ontario Farm Animal Council (OFAC) has updated and created several new animal care resources. (From OFAC Outlook, September 2010)

Should This Animal Be Loaded?

The two documents, for pigs and cattle, sheep and goats, have been updated to reflect a change in the Canadian Food Inspection Agency's transportation policy. Animals that now fall under Class 3 Lameness are non ambulatory and are not to be transported (except on advice from a veterinarian).

Caring for Compromised Cows and Caring for Compromised Pigs (Updated)

These guides help cattle and pig farmers recognize health related problems and respond to them in a timely and responsible manner.

Too Fat, Too Thin or Just Right

This brochure on body condition scoring for dairy cattle, was designed to bring awareness of body condition scoring and what condition cull cows should be in when leaving the farm for further processing. Copies will be mailed to Canadian dairy farmers with the help of Dairy Farmers of Canada.

Guide to Footrot in Sheep

This new factsheet highlights what causes foot rot and what needs to be done if your sheep have it. The Ontario Sheep Marketing Agency will distribute copies to its producers.

Copies of these resources can be obtained by calling the OFAC office, (519) 837-1326, or by clicking on the "Animal Care Resource Library" button on the website at www.ofac.org

Continuing Education/Coming Events

- December 1, 2010 Ontario Swine Health Advisory Board (OSHAB) Big Bug Day VIII, Arden Park Hotel, Stratford, Ontario. www.opic.on.ca
- December 1 & 2, 2010 Sheep Infrastructure Workshop, sponsored by the Large Flock Operators and OMAFRA, Western Ontario (Dufferin-Bruce Area). www.omafra.gov.on.ca/english/livestock/sheep/20081211.htm
- December 3 & 4, 2010 2010 International PRRS Symposium, Downtown Chicago Marriott, Chicago, Illinois. www.prrs-symposium.org
- December 4-8, 2010 56th Annual American Association of Equine Practitioners Convention, Baltimore, Maryland. www.aaep.org/convention.htm
- December 7, 2010 Vet Night—Building the Foundation—2010 Dairy and Veal Healthy Calf Conference, Stratford Agriplex, Stratford, Ontario, 5:30—8:45 p.m. Contact Kendra Keels, kkeels@livestockalliance.ca, (519) 824-2942.
- December 8, 2010 Building the Foundation—2010 Dairy and Veal Healthy Calf Conference, Stratford Rotary Complex, Stratford, Ontario. www.ontarioveal.on.ca/main.html
- December 15, 2010 2010 Shakespeare Swine Seminar, Pork Production—A Local and Global Perspective, Shakespeare Community Centre, Shakespeare, Ontario. Contact Agricultural Information Contact Centre 1-877-424-1300
- January 23-26, 2011 NMC 50th Annual Meeting, Hyatt Regency Crystal City, Arlington, Virginia. <http://nmconline.org/meetings.html>
- February 15 & 16, 2011 Free-stall Housing Design Seminar, Arden Park Hotel, Stratford, Ontario. Contact Agricultural Information Contact Centre 1-877-424-1300
- February 17-19, 2011 Ontario Association of Veterinary Technicians 33rd Annual Conference, London Convention Centre, London, Ontario. www.oavt.org/conference/index.php
- February 23, 2011 Tie-stall Housing Design Seminar, Firehall Community Room, Mount Forest, Ontario. Contact Agricultural Information Contact Centre 1-877-424-1300
- March 1, 2011 Tie-stall Housing Design Seminar, Royal Canadian Legion, Kemptville, Ontario. Contact Agricultural Information Contact Centre 1-877-424-1300
- March 2 & 3, 2011 Free-stall Housing Design Seminar, Royal Canadian Legion, Kemptville, Ontario. Contact Agricultural Information Contact Centre 1-877-424-1300
- March 5-8, 2011 American Association of Swine Veterinarians 42nd Annual Meeting, Pointe Hilton Tapatio Cliffs Resort, Phoenix, Arizona. www.aasv.org/annmtg
- March 8-11, 2011 Western Canadian Dairy Seminar, Capri Hotel, Trade and Convention Centre, Red Deer, Alberta. www.wcds.afns.alberta.ca
- March 24-27, 2011 American Animal Hospital Association (AAHA)/Ontario Veterinary Medical Association (OVMA) Conference, Metro Toronto Convention Centre, Toronto, Ontario <https://secure.aahanet.org/eWeb/StartPage.aspx?site=AAHAAYC2011>

(Continued on page 26)

Continuing Education/Coming Events (continued)

- April 6 & 7, 2011 Sheep Infrastructure Workshop, sponsored by the Large Flock Operators and OMAFRA, Eastern Ontario (Kemptville Area)
www.omafra.gov.on.ca/english/livestock/sheep/20081211.htm
- June 12-15, 2011 6th International Symposium on Emerging and Re-emerging Pig Diseases, Palau de Congressos de Catalunya, Barcelona, Spain. www.emerging2011.com
- June 19-22, 2011 Safe Pork Conference 2011, La Bonbonnière, Maastricht, the Netherlands
www.safepork.org
- August 8-11, 2011 5th International Workshop on the Assessment of Animal Welfare at Farm and Group Level (WAFI), hosted by the Campbell Centre for the Study of Animal Welfare and the Ontario Veterinary College, Guelph, Ontario. www.uoguelph.ca/ccsaw/wafi/
- September 22-24, 2011 3rd International Symposium on Mastitis and Milk Quality will be held in conjunction with the American Association of Bovine Practitioners 44th Annual Conference, St. Louis, Missouri. www.nmconline.org/meetings.html
- February 18-22, 2013 International Sheep Veterinary Congress, Christchurch Convention Centre, Christchurch, New Zealand. <http://conference.intsheepvetassoc.org>
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