Ceptor Animal Health News

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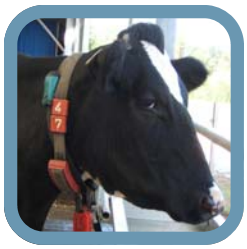

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Ceptor Survey Results—We Hear You!

Kathy Zurbrigg, Veterinary Services Unit, and Carolynne Gilchrist, Client Services Branch, OMAFRA

Thanks to those readers that responded to our survey in the December 2008 issue. We are pleased to hear that overall you find Ceptor a practical and informative newsletter. You did point out a few issues though and we will work hard in 2009 to incorporate your suggestions.

Of the 657 surveys that were mailed out we had 126 responses (19%).

Table 1

	Question	Percent "yes" responses
1.	Do you find Ceptor articles valuable?	95%
2.	Are the articles timely?	97%
3.	Do you use the articles with your work?	89%
4.	Has an article ever influenced a decision you made?	87%

The most common uses of Ceptor articles reported were for: advising clients (71%), updating themselves on welfare, disease and regulatory issues (63%), and updates on meetings and continuing education events (41%).

The top five "more articles on" requests were: disease reports, University of Guelph research, housing and husbandry, food safety and animal welfare. We had many responses for both more and fewer articles on various species. We will try to achieve a more even balance of articles but it is hard to please everyone as our readership includes veterinarians in a variety of specialties and occupations.

Addressing all the comments received would make this a lengthy article (and the majority of you indicated that short and concise is better!), but I would like to respond to a few comments.

"It would be nice if Ceptor was available on the web" – Ceptor can be found on the web at *www.omafra.gov.on.ca/english/livestock/ceptor/news.html* Back issues are at *www.oabp.ca.* If you would like to be notified by e-mail when a new issue of Ceptor is posted on the website instead of receiving a hard copy in the mail, please just let us know.

"Change the layout-more than one topic per page makes it more difficult to file for future use" – We try to follow a standard layout for efficient printing. Articles can be copied from the online version and printed singly for filing.

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"Publication dates are often inconsistent"–We strive for four publications a year. We place a high value on our newsletter but it is only one component of our jobs. At times we have to adjust the publication dates.

Our goal for Ceptor is that it is a quick, practical source of information on a variety of current topics for livestock veterinarians in Ontario. From your comments we seem to be on track.

Thanks to all respondents for your positive comments and suggestions for change.

Clarification – TSE Article, December 2008

Submitted by Lloyd Banbury, Alberta

The following information has been provided by the Canadian Food Inspection Agency (CFIA) to clarify the timelines for precautionary measures implemented in Canada for protection against BSE.

- Controlling the importation of products that are assessed to have a high risk of introducing BSE into Canada. Canada only allows the importation of live ruminants and their meat and meat products from countries that Canada considers to be free of BSE. Canada also has additional import controls for animal products and by-products from countries that have confirmed BSE in native animals. Their animal products are assessed on a case-by-case basis and may be permitted entry if they are judged not to present a risk of introducing BSE.
- Canada has not imported ruminant-derived meat and bone meal for the purpose of livestock feeding from Europe for more than a decade. In December 2000, the CFIA suspended the importation of rendered animal material of any species from any country that Canada did not recognize as free of BSE.
- Making BSE a reportable disease in 1990, such that any suspect case of BSE must be reported to a federal veterinarian.
- The creation of a surveillance program in 1992 in which the brains of high-risk cattle are tested for the disease.
- Since 1997, Canada has banned the feeding of rendered protein products from ruminant animals (cattle, sheep, goats, bison, elk or deer) to other ruminants.
- The creation of a Canadian Cattle Identification Program in 2001 for cattle and bison, making it possible to trace individual animal movements from the herd of origin to slaughter.
- Canada requires the removal of certain cattle tissues, know as specified risk material (SRM), from all animals slaughtered for human consumption. SRM are tissues that, in BSE-infected cattle, contain the agent that may transmit the disease. In diseased animals, the infective agent is concentrated in certain tissues such as the brain and spinal cord.

New Mastitis Test to be Offered by CanWest DHI

Ann Godkin, Veterinary Services Unit, OMAFRA

Representatives from CanWest DHI have announced that the organization will gradually roll out the Finnzymes PCR test for the detection of *Staphylococcus aureus* bacteria in preserved DHI milk samples, in the early spring. The gradual roll-out will give herd veterinarians time to learn about the new test. Interpretation of the test results, using knowledge of the cow, her SCC history, the herd's mastitis pathogen status and the mastitis prevention practises in place will be critical to applying the test in an efficient manner. The test has been validated in Finland using North American strains of bacteria. CanWest DHI has conducted some preliminary research in Ontario, running the test in parallel to conventional culture, and will soon be able to provide veterinarians with information about the test parameters and utility.

Stay tuned for more information. CanWest DHI plans a direct mail-out of an information package to veterinarians in the near future.

Contagious Equine Metritis Investigation Update –February 12, 2009

Bob Wright, Veterinary Services Unit, OMAFRA
Dr. Susan Wray, Program Specialist - Import, Canadian Food Inspection Agency

On December 15, 2008, the State of Kentucky confirmed a case of contagious equine metritis (CEM) in a quarter horse stallion on a central Kentucky premises. This has sparked a North American wide trace-out for horses bred or in contact with infected horses in the 2008 breeding season.

A total of 11 stallions have now been confirmed as positive for *Taylorella equigenitalis*, the causative agent of CEM, by USDA's National Veterinary Services Laboratories (NVSL). In addition to the positive stallions, two mares have been found positive for *T. equigenitalis* by the NVSL. The positive stallions are located in four States: three in Indiana, four in Kentucky, one in Texas, and three in Wisconsin. One positive mare is located in Wisconsin and one in Illinois.

In addition to the 11 positive stallions and 2 positive mares, locations have also been confirmed for 562 additional horses exposed to *T. equigenitalis*. The 575 horses are located in 45 States. There are 70 positive or exposed stallions in 14 States and 505 positive or exposed mares in 43 States. Another 33 exposed horses, 19 mares and 14 stallions, are still actively being traced.

Thus far the investigation has led to 10 potentially exposed mares in 6 provinces (Ontario, Alberta, British Columbia, New Brunswick, Quebec, Saskatchewan) in Canada.

Infection has occurred in quarter horses, Paints and one imported Friesian stallion (1).

Contagious Equine Metritis (CEM) is a transmissible venereal disease of all equids. It is a reportable disease in Canada under the *Health of Animals Regulations*, and all cases **must be** reported to the Canadian Food Inspection Agency (CFIA). Occasionally, CEM is found in imported stallions while still in quarantine in both the USA and Canada.

CEM was first discovered in Europe in 1977. CEM is transmitted venerally between mares and stallions, as well as by contamination of insemination equipment and semen. Stallions do not suffer any symptoms. In the mare, infection causes endometritis with a mucopurulent vaginal discharge preventing pregnancy, or causing abortion. The disease is treatable with disinfectants and antibiotics. Stallions and mares can become chronic carriers of CEM and be sources of infection for future outbreaks (1). The bacteria can be spread by artificial insemination. However, antibiotics are commonly added to semen extenders to eliminate the spread of bacteria. CEM-positive horses can be treated with disinfectants and antibiotics and remain quarantined until a treatment protocol is completed and they test negative for the disease.

CFIA has quarantined exposed animals on the farms and these measures remain in place until all exposed mares and their foals have tested negative for CEM. All test results to date have been negative. Some testing will not be complete until pregnant mares have given birth (2). Effective January 19, 2009, CFIA implemented a requirement for additional certification for the import of live horses from the United States. The extra certification statements that must be added to the US health certificate are as follows:

"The horse(s) have not been on a premise where T. equigenitalis has been isolated during the 60 days immediately preceding exportation to Canada or a premise currently under quarantine or investigation for CEM. Any female(s) in the shipment have not been bred naturally to, or inseminated with, semen from a stallion positive for CEM, or a stallion resident upon a positive premise or under quarantine or investigation for CEM. AND
Showed no clinical signs of CEM on the day of inspection."

To view the new import requirements for CEM refer to the CFIA website *www.inspection.gc.ca/english/anima/disemala/equinmet/20090203inde.shtml*

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1. *Contagious Equine Metritis. Newsroom. United States Dept of Agriculture. February 12, 2009. www.aphis.usda.gov/newsroom/hot_issues/cem/index.shtml Accessed February 12, 2009.*
2. *Update to the Contagious Equine Metritis Investigation February 9, 2009. www.inspection.gc.ca/english/anima/disemala/equinmet/situatione.shtml Accessed February 12, 2009.*

Cool, not Cold, Milk for Calves or Kids

Neil Anderson,
Veterinary Services Unit, OMAFRA

Two recent cases prompt this brief caution about feeding cold, rather than cool, milk or milk replacer in free-access feeding systems. Both farms offered acidified milk or milk replacer at ambient temperature in cold housing barns.

The first case was kids in Alberta and the second was calves in a curtain-walled, free-stall barn in Ontario. The kids and calves either refused to drink or drank very small volumes of the cold milk. At the goat farm, kids died within a few days of introduction to the feeding system. At the dairy farm, calves were thin and sickly looking and morbidity and mortality were unacceptable. To take the chill off the milk, the owners installed aquarium heaters in a water bath positioned in the milk barrel and placed insulation around and beneath the barrel. With the chill off the milk, owners reported a rapid and dramatic increase in milk consumption and the kids and calves responded with good health, vigour and playfulness.

When trouble shooting free-access feeding systems, take the temperature of the milk or milk replacer in front of the calves. It should be fed cool (20±2°C), and to be sure, not cold, warm or hot.

A checklist for trouble-shooting the system is available on page 11 of the printable version of the document – *Setting up the System* - at *www.omafra.gov.on.ca/english/livestock/dairy/calves/formicacid.htm*

Softer Beds Help Lame Dairy Cows

Neil Anderson,
Veterinary Services Unit, OMAFRA

Our 'new' free-stall barns with larger dimensioned stalls are showing a bit of age now. The first barn with 18-foot, head-to-head stalls is approaching six years. With time, producers, cows and their veterinarians are noticing some changes.

Consider Rob's message about a newer barn. "Overall, they are extremely happy with the stall design in the barn. However, they have been noticing over the past couple of years that several cows are getting hook bone lesions from banging the dividers when getting up in the stalls. If a cow is lame, she is especially obvious in contacting the divider." Rob very astutely noticed a link between lameness, how the cows used the stalls and the injuries. The stalls have dividers and rubber-filled mattresses that were manufactured in Ontario. The bedding is straw (**Figure 1**).

Figure 1 shows cows resting in free-stalls in the case-study barn.

Rob's case illustrates the importance of the softness of the bed for lame cows. Dr. Nigel Cook, University of Wisconsin, reported that lame cows use sand stalls normally. However, in barns with rubber-filled mattress stalls (i.e., firm beds), lame cows have shorter stall use sessions, increase stall standing and show difficulty in rising and lying. Briefly, lame cows cope when given a soft bed.

To be sure, lame cows should receive intensive treatment. Good nursing care should include mitigating the effects of mattresses that have compacted over time. Since changing to sand is not

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an option, a layer of foam beneath the top cover may be a practical solution. It's worth a try in a group of stalls. If a softer bed helps the lame cows in the test stalls, the renovation should be done in the remainder.

Four Times-a-Day Feeding, Twice a Day; A Better Way to Feed Lactating Sows?

Tim Blackwell, Veterinary Services Unit, OMAFRA

Achieving adequate feed consumption in lactating sows is one of the more challenging tasks in swine production. Although infectious disease is often considered likely in cases of poor reproductive performance, weight loss in lactating sows, although difficult to visually assess, accounts for a large proportion of poor reproductive performance in sow herds. The introduction of computerized liquid feeding systems or self-feeders for lactating sows has shown us how much feed some sows can eat and apparently need.

Sophisticated formulas exist for calculating energy to protein ratios and intake based on sow body weight, back fat, and piglet weight gain. A more simple approach is the rule of thumb that says a sow should consume, on each day of a 21-day lactation period, her gestation feed allowance plus one pound of feed for every pig weaned. For example, if sows are consuming 4.5 lbs of feed per day during gestation and are weaning an average of 10 pigs per litter, they should eat approximately 305 lbs of feed during lactation ((4.5 + 10) x 21 days), if one is to expect excellent reproductive performance.

Unfortunately, pushing sows onto feed too vigorously after farrowing may result in some feed refusal. This uneaten feed must be removed before the next feeding as it becomes stale and unappetizing for the sow, leading to a further decrease in consumption. As a result, there is a natural tendency to err on the conservative side when feeding sows to avoid the added cost and labour associated with tossing out uneaten lactation feed. Unfortunately, if all sows clean up all their feed every day, then some sows are almost certainly being under fed.

Some producers have addressed this problem by continuing with their conservative feeding practices morning and evening. However 20 to 30 minutes after each feeding, stockmen go back through the farrowing rooms with the feed cart. Any sow that has cleaned up her allotted ration and is looking for more receives an additional 1 to 2 lbs of feed. Depending on the farm, this may involve extra feed for anywhere from 10 to 20% of the lactating sows. By identifying this small percentage of hungry sows and giving them one or two extra pounds of feed after each regular feeding, the percentage of sows in heat the first week after weaning as well as the farrowing rate have increased by 5 to 10% on some farms.

Feeding sows four times a day with a twice-a-day feeding schedule may be a workable compromise between the negative consequences of overfeeding some sows and underfeeding other sows.

Saliva or Serum?

Greg Wideman, Maitland Swine Services, and Tim Blackwell, Veterinary Services Unit, OMAFRA

A recent article by Prickett, *et al,* in the *Journal of Swine Health and Production*[1] demonstrated the use of cotton ropes to collect saliva samples from pigs for the identification of PRRS virus through rtPCR testing. In their study, there was 77% agreement between the results from individual pig sera and saliva samples for the identification of the presence of PRRS virus using rtPCR at the pen level of analysis. It is not surprising that voluntary chewing on a rope by pigs in a pen is less reliable than individual blood samples in identifying PRRS virus in a swine herd. Nevertheless, on occasion, when time and money constraints result in less than ideal numbers of samples being collected from groups of pigs, saliva samples collected from cotton ropes hung in individual pens may prove to be a useful and cost-effective addition to the blood testing.

In a 1200-head finishing barn, where the objective is to be 90% certain that no more than 10% of pigs are viremic at the time of sampling, blood samples from 22 randomly selected pigs should be collected.

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Unfortunately, often fewer samples are collected and, occasionally, there is a tendency not to collect blood from the largest, most difficult pigs to restrain in the barn. Hanging cotton ropes in the finishing pens (**Figure 1**) for one to two hours (allowing at least 5 to 10 pigs to chew on each rope) can provide added assurance that the results of blood sampling, particularly negative results, are in fact representative of the actual status of the pigs in the barn.

Figure 1. Cotton ropes hung in individual pens may prove to be a useful and cost-effective addition to the blood testing.

Preliminary work, indicates that saliva sampling from cotton ropes agrees with blood samples from the same pens approximately 75% of the time, coming close to the findings of Prickett, *et al.* Agreement between sera and saliva testing is likely influenced by the viral strain, stage of infection, age of pigs and pen design. Less virulent strains, such as the vaccine virus, may be shed in lower numbers. Sick or recently weaned pigs may be less likely to interact with the rope.

In the 1200-head finishing barn, if only 10 pigs were to be blood tested in two pens but cotton ropes were hung in five additional pens, saliva testing of the ropes would provide greater confidence in the PRRS virus status of the pigs. To save laboratory fees in this example, hierarchal testing could be used. Serum samples could be tested first; if negative on rtPCR testing, the saliva samples could be tested the following day. This would provide a timely, added level of confidence in the results from the serum testing. The ease of collecting saliva samples may also encourage more frequent on-farm testing, which adds confidence to any monitoring program. More frequent testing may be particularly well suited to saliva sampling as there is some evidence that virus does not persist in saliva as long as it does in serum.

Although saliva testing is not as sensitive as serum testing for the identification of PRRS virus, the ability to sample more animals in more pens with less effort means that saliva sampling of pigs for the identification of PRRS virus may be a useful addition to a veterinarian's diagnostic toolbox.

Prickett JR, Kim W, Simer R, et al. Oral fluid samples for the surveillance of commercial growing pigs for Porcine Reproductive and Respiratory Virus and Porcine Circo Virus type 2 infections. J Swine Health Prod 2008;16 (2):86-91.

Germany: Piglet Castration Only with Analgesia

Kathy Zurbrigg, Veterinary Services Unit, OMAFRA

Adapted from a January 29, 2009 PIGPROGRESS.net article

The use of analgesia for male piglet castration will be compulsory in Germany as of April 1, 2009. The decision was finalized on January 28, 2009, in Berlin by an advisory committee on food quality and security.

In Germany and the Netherlands there has recently been extensive discussion on improving male piglet welfare through a ban of surgical piglet castration. However, German producers felt that there had not been enough research into practical alternatives to surgical castration. The use of analgesia during piglet castration is a compromise between producers, industry, consumers and retailers. A committee has

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been set up to investigate the most practical and cost effective methods to replace surgical castration in the future.

This development follows immense pressure from animal welfare organizations and retailers primarily in the Netherlands, but some also in Germany.

Neospora caninum in Avian Species – Part of the Abortion Equation for Cattle?

Ann Godkin, Veterinary Services Unit, OMAFRA

Two investigations of abortion storms in cattle have reported an epidemiological association between the infection of cattle with *Neospora caninum* and the presence of dogs and poultry on the affected farms. While the role of dogs has been explored, little is known about the implications of poultry. Naturally occurring infection of chickens with *N. caninum* had not been previously identified.

In a 2008 study from Brazil, sera from both indoor (n= 400) and outdoor chickens (n=200) were tested for antibodies to *N. caninum*. Among outdoor chickens, 23.5% tested positive, which was significantly higher ($p < .001$) than the 1.5% test-positive rate of indoor chickens. Brains from ten sero-positive chickens were also tested by PCR for evidence of the organism; six were positive.

The authors report that this is the first confirmation of natural infection of chickens with *N. caninum*, and it indicates the potential for chickens to serve as an intermediate host for this parasite, like cattle do. Dogs and coyotes, so far, remain the only confirmed definitive hosts, where the parasite can undergo sexual reproduction resulting in the production of infective oocysts.

Chickens may play a role in the life cycle of *N. caninum* on a farm. The increased rate of sero-positivity in the outdoor chickens suggested they became infected by the ingestion of oocysts in the soil. Experimentally, it has been shown that, when chickens and embryonated eggs were infected with tachyzoites of *N. caninum*, dogs shed oocysts after ingestion of the chicken eggs.

Further work is underway to characterize the parasite from chickens and to compare the chicken isolates to mammalian ones. Additionally, it will be necessary to determine how efficient and likely transmission between chicken and dogs is to assess the real risk this additional host poses for cattle.

Exploration of the role and significance of avian species in the life cycle of *Neopsora caninum* continues. A very recent publication (February 2009) has also shown that pigeons (*Columbia livia*) can experimentally be infected with *N. caninum* and that following infection the parasite disseminates throughout various tissues.

Many investigations of abortion outbreaks where *N. caninum* subsequently has emerged as the likely culprit are left unresolved with regards to the introduction of the infection to the farm and to various groups of cattle. There is potential for chickens and pigeons to be present on cattle farms and to move freely from farm to farm. It will be interesting to see if further research confirms them as an important reservoir in nature for *Neospora caninum*, as well as a way for infection to be passed to dogs on farms. Given the epidemiological associations shown previously, and the evidence so far for infection in avian species, bird control and prompt removal of dead birds so dogs can't eat them would be a prudent step for abortion prevention.

Costa KS, Santos SL, Uzeda RS, Pinheiro AM, Almeida MAO, Araujo FR, McAllister MM, Gondim LFP. Chickens (Gallus domesticus) are natural intermediate hosts of Neospora caninum. International Journal for Parasitology 2008; 328:157-159.

Tiago MWP, Carrascoa AOT, Marciano JA, Werther K, Pinto AA, Machado RZ. Pigeons (Columba livia) are a suitable experimental model for Neospora caninum infection in birds. Vet Parasit 2009; 159 (2):149-153.

Update – Research Continues on the Ontario and Western Canadian Johne's Disease Control and Prevention Project

Ulrike Sorge, Ontario Veterinary College, University of Guelph

The Johne's Disease (JD) project was initiated in 2005 through collaboration of industry (CanWest DHI, Dairy Farmers of Ontario (DFO) and additional provincial milk marketing agencies) and government (OMAFRA plus provincial veterinary contacts in Manitoba, Saskatchewan, Alberta, and British Columbia), with funding from the federal government CanAdapt program. Progress in the search for the most efficient, risk-based approach to on-farm prevention of the spread of Johne's Disease in Canadian dairy herds continues.

A total of 640 herds were originally enrolled in the project by their herd veterinarian. Together the producers and veterinarians reviewed the results of a Johne's milk ELISA test done on all lactating cows and completed a Johne's risk assessment and pre-visit survey. Approximately a year after each herd's original enrollment, 499 herds were contacted for participation in a follow-up test and assessment. In total, 240 dairy producers agreed to participate (Ontario 182, Manitoba 14, Saskatchewan 10, Alberta 17 and British Columbia 17). About 30 to 50% of originally enrolled producers per province opted in. The proportion of test-positive herds participating, approximately 40%, was consistent across provinces (a positive herd was defined as having at least one cow with either a positive or suspect milk ELISA test).

In 2008, a telephone survey was conducted asking the producers about the practicality of the recommendations made, their general perception of the importance of JD and their opinions regarding this JD prevention strategy. Most commonly (74%), producers reported that they joined the project because they wanted to be proactive and to keep JD low in their herd. Some (42%) reported that they had experienced a negative economic impact of JD on their farm, while 50% were concerned for the image of the dairy industry and possible consumer reaction to any link between JD and Crohn's disease. Although most producers did not comply with the management changes suggested by their veterinarians, they still thought the recommendations were reasonable. The main reason given for non-compliance was "we culled the test-positive cow" or "I didn't see the need to change." Despite this lack of activity, the producers generally liked the approach and found that ,if they implemented some of the management recommendations, they observed a reduction in calf diseases as an additional benefit.

As of the time of the writing of this article, 68 herds have completed the follow-up herd test for JD, done 2.3 to 3.5 years after the first test. Although, so far, only a small number of herds have been retested, there are some interesting trends developing. Most of the herds classified as positive on the first herd test, have a lower proportion of the herd with positive tests on the second test, and the overall number of high-titer cows (OD > 1.0) has dropped (decreased from 0.47% to 0.15%). Culling appears to have assisted in reducing the prevalence of positive tests as 84% of herds that culled their JD test-positive cows reduced their prevalence, while only 56% of herds that did not cull had a lower prevalence at the second test. However, the reduction in the within-herd rate of test positives on the second round may turn out to be only a short-lived advantage, because the rate of positive tests in first lactation animals in the second round was almost identical (1.4%) to that in the first round (1.6%).

So far, overall, fewer cows have positive tests on the second round compared to the first (1.7% versus 2.5%). Unfortunately, 13 of 40 herds that were negative on their first herd test have at least one test-positive cow on the second testing. These results again confirm that a single herd test is insufficient for establishing the JD status of a herd.

The utilization of individual box stalls for calving is surfacing as a good management practice to reduce prevalence of JD. Herds where calving occurred in individual pens had a lower prevalence on second testing (1.6% test positives within herd) compared to group-calving herds (2.2%). Herds where cows calved alone also had a larger decrease in their herd's apparent prevalence between tests (a decrease of 1.3% versus an increase of 0.9% respectively, $p < 0.04$).

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Thanks to additional funding from DFO, the entire contingent of study herds enlisted for the follow-up project will now be able to complete the second round of testing at no charge. Testing will continue to occur over the next six months and further analysis will be conducted. Completion and enlargement of the data set will allow more in-depth examination of Johne's Disease epidemiology in Ontario and Western Canadian herds and a closer examination of the impact of our herd management practices on it's spread and persistence.

Thank you to all the veterinarians and producers out there who continue to work with us on this project. Your efforts are providing an important contribution to our knowledge as we work to develop the best way forward for the Ontario and Western Canadian dairy industry.

Johne's Presentation at the DFO/DHI Annual Meeting, January 2009

Ann Godkin, Veterinary Services Unit, OMAFRA

On January 13th, at the invitation of Dairy Farmers of Ontario and CanWest DHI, Dr. Michael Collins of the University of Wisconsin presented information about Johne's disease at the technical session of the joint annual meeting. The information was well received and it was apparent the interest was high. As few veterinary practitioners attended this meeting, it may be of interest to know what questions were asked so that you can anticipate questions from your clients.

1. *Will there be false-positive results on the test?* Depending on the strength of the test result, there can be false-positive results; however, cows classified as "strong positives" are rarely false-positive, meaning the odds are less than 1 in 500.
2. *Do processors ever participate in funding on-farm Johne's prevention programs?* In The Netherlands processors play an important funding role; however, the marketing structure is different than here in Canada. Typically, so far, world wide processor involvement is limited.
3. *Can calves be tested for Johne's?* They can be, but they shouldn't be because it's a waste of money. They are very unlikely to test positive even if they are infected.
4. *Can MAP be introduced to a farm by means other than cattle?* While some species of wildlife can become infected, for practical purposes their ability to pass the infection back to cattle is very limited. Most likely wildlife species are a dead-end host for MAP. Water on the other hand, if contaminated by manure from shedding cattle and consumed downstream by other cattle, can move infection from one farm to another.
5. *What about pasteurizing or acidifying milk for calves to decrease MAP?* Pasteurizing non-saleable milk on farm is effective, economical and appears to help prevent MAP infection of calves. Pasteurization of colostrum is more difficult and, if not done right, can decrease the level of immunoglobulins. Work in Chile with formic acid suggests that MAP numbers are reduced to very low levels after 30 hours of contact time. Work on formic acid, acidified milk is ongoing in Chile and here in Ontario.
6. *What should happen to strong test-positive cull cows?* Disposal and rendering will ensure that they don't spread the infection to someone else's herd.
7. *When you did your demonstration project, where did your study herds source replacements from?* Some of the herds elected not to purchase or introduce any animals – all replacements were home-raised. Other herds sourced replacements from identified negative/low-risk herds, but it was admittedly hard to do.
8. *What is the impact of Johne's (test-positive cows) on embryos?* If the embryos are washed according to international standards, then Johne's disease will not transfer via the embryo.
9. *Does the accuracy of the ELISA change depending on stage of lactation?* Researchers are still looking at the impact of lactation number, DIM, and breed on test interpretation. Currently it's reasonable to suggest that samples for milk ELISA not be collected at peak lactation to minimize the impact of antibody dilution.
10. *Is liquid manure on hay a risk for infecting calves with Johne's?* If infectious cows are removed from the herd, then herd owners can stop worrying

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about manure. Manure on hay would be a theoretical infection transmission risk but is far less likely compared to other risks.

11. *Can calves be infected with Johne's before they are born?* Yes, research shows that 10 to 50% of calves born to cows with positive tests will be infected pre-partum. The stronger the cow's test result, the greater the chance of in utero infection of the fetus.
12. *Is pasteurization of colostrum recommended?* It probably reduces the MAP concentration but it is very difficult to do well. Most producers find it is easier and better to use colostrum from one test-negative cow, collected cleanly, to feed to calves.
13. *Does the bacteria that causes Johne's disease in cattle cause Crohn's disease?* At this time no one knows for sure.

Mycobacterium avium paratuberculosis (MAP): Single Tests Can Fool You.

Ann Godkin, Veterinary Services Unit, OMAFRA

Testing cattle for Johne's disease is challenging because of the low responsiveness of the cow's immune system to the infection and the intracellular location of MAP. It is informative to do repeated testing on cows suspected to be infected, to see what the probability of positive results is over time and across different types of tests.

Recently, four cows from herds where Johne's Disease was known to be present, were subjected to repeated sampling and testing over five consecutive days. One milk sample and one manure sample were collected daily. The daily manure sample was split and cultured three times at the Animal Health

Table 1. Milk ELISA and Fecal Culture Results on Four Cows Tested on Five Consecutive Days

Day		Test	Cow 1	Cow 2	Cow 3	Cow 4
Day 1		Milk ELISA	0.02	0.02	1.48 (P)	0.08 (Susp)
Day 2			0.01	0.06	1.37 (P)	0.05
Day 3			0.01	0.02	1.64 (P)	0.04
Day 4			0.01	0.02	1.46 (P)	0.03
Day 5			0.01	0.02	1.49 (P)	0.02
Day 1	A	Fecal culture	N	N	P	P
	B		N	N	P	N
	C		N	N	P	N
Day 2	A		N	N	N	P
	B		N	N	N	P
	C		N	N	N	P
Day 3	A		N	N	P	P
	B		N	N	P	N
	C		N	N	P	N
Day 4	A		N	N	P	N
	B		N	N	P	N
	C		N	N	P	N
Day 5	A		N	N	P	N
	B		N	N	P	N
	C		N	N	P	N

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Laboratory, University of Guelph. The milk samples were tested at CanWest DHI. Cows with milk ELISA S/p ratios of less than 0.07 were classified as negative; those with results from 0.07 to 0.10 as suspicious; and those greater than 0.1 as positive. The results are shown in **Table 1**. Cells with results classified as positive on either test are shaded.

This is a very small sample size so conclusions are limited. Cows 1 and 2 were both negative on the milk ELISA and both were fecal culture negative on ALL manure samples. Cows 3 and 4 had evidence of infection. Cow 3 was classified as a HIGH positive on all 5 days of milk ELISA testing and on 4 of 5 days based on fecal culture. Cow 4 had a suspect ELISA value on one day, but negative ELISA results on the next 4 days. On fecal culture, she was negative on 3 of 3 cultures on 2 days, positive on 3 of 3 on another day and positive on only 1 of 3 cultures on the remaining 2 days. Ultimately she was positive on 5 of 15 cultures (33%).

There is seldom complete agreement between tests. Care should be taken if one test type is to be used to confirm the results of another. Fecal culture "missed" cow 3 on one day compared to milk ELISA; milk ELISA "missed" cow 4 on one day compared to fecal culture. If the goal of a testing program is to identify the cows most at risk of shedding MAP, then, in this case, there is a high probability that on any given day cow 3 would have been identified by either test as being a cow at high risk of shedding MAP to young calves in the herd.

This repeated, short term, testing scheme reinforces the interpretation in place for the milk ELISA test results. As milk antibody titre increases, the relationship between milk ELISA and fecal culture becomes more consistent. When the milk ELISA result is positive, more than 50% of these cows are likely to be shedding MAP in manure. When the ELISA S/p ratio is over 1.0, it is likely that over 80% of cows will be fecal shedders. Less than a third of cows with low positive or suspect S/p ratios are expected to be shedding MAP. Among test-negative cows, less than 3% would be shedding.

A key feature of all Johne's testing is the increased knowledge and confidence in cow and herd status that is gained over time with repeated test results. In Denmark as of 2006 and the UK as of September 2008, formal herd programs are used where cows are tested three to four times annually using a milk ELISA test. When herd tests are repeated, greater definition of the true herd status with regards to Johne's is achieved.

Mycobacterium avium paratuberculosis (MAP): Survival in the Environment

Ann Godkin, Veterinary Services Unit, OMAFRA

Producers are interested in the survivability of *Mycobacterium avium paratuberculosis (*MAP) in the farm environment. Understanding the persistence of MAP in the environment helps to assess the degree of risk for cattle when manure is applied to land. Here are some survivor "benchmarks" for MAP from recent scientific publications.

MAP in stored manure: Manure from a large free-stall dairy herd was inoculated with MAP organisms and subjected to three treatments: composting at 55°C, composting at 25°C (similar to a bedded pack) and simulated liquid manure storage. MAP was detected by culture on the day of inoculation but not on any of the following 56 days in either of the composted treatments. MAP was cultured from the liquid manure on day 0 and on days 14, 28 and 56. MAP DNA was detectable with direct PCR on all days in all three treatments and ultimately up to 175 days in the liquid storage, but the viability of the organism could not be determined. Composting under these conditions was successful in reducing live MAP in manure and points out that liquid manure poses significant opportunity for viable MAP survival.

Grewal SK, et al. Persistence of MAP and other zoonotic pathogens during simulated composting, manure packing and liquid storage of dairy manure. Applied Environmental Microbiology, January 2006.

MAP in manure on pasture: MAP survived up to 55 weeks in a dry, shaded environment but only up to 18 weeks when in an unshaded location in Australian research. Shade was an important

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protective factor. Survival was not affected by moisture or by lime added to soil. Genetic elements identified in MAP suggested that the organism has the capacity to undergo "dormancy", which may contribute to its survival in the environment. While it may survive, its ability to flourish is limited because it is an obligate parasite of animals.

Whittington RJ, et al. Survival and dormancy of Mycobacterium avium subsp. paratuberculosis in the environment. Applied Environmental Microbiology, May 2004.

MAP is a tough bug and has an impressive ability to survive outside the host. While this raises interest in the risk that might be attributable to its persistence in the environment, the risk for infection of cows from the environment will largely depend on the number of cows actively shedding MAP into manure. If there is MAP in the manure, composting of manure and allowing time to elapse between manure applications and cropping or pasturing appears to attenuate risk.

Infected cows serve as a reservoir and multiplication site for MAP on farms. The best way to reduce the risk of environmental contamination with MAP is to reduce the infection rate and MAP shedding by cows.

Rumensin CRC and Johne's Disease Prevention

Ann Godkin, Veterinary Services Unit, OMAFRA

Last summer the Rumensin CRC bolus from ELANCO received a new claim from Health Canada. To assist veterinary practitioners in assessing the utility of this product, the specific wording of the additional claim is provided below.

"Claim 4: For the reduction in fecal shedding of *Mycobacterium avium paratuberculosis* (MAP) in mature cattle in high risk Johne's Disease herds, as an aid in the herd control of Johne's Disease, as one component of a multi-component Johne's Disease control program.

Note: Other considerations for effective Johne's disease control programs include: Identification and culling of clinical cases and heavy shedders, and reducing the exposure of calves to the pathogen (e.g., feeding colostrum/milk to calves from animals that are disease free, using uncontaminated pasture to raise calves and replacement heifers, etc.)

Directions for use 3: For reduction in fecal shedding of MAP by mature cattle, administer one capsule orally 2 to 4 weeks prior to expected calving date, using the Rumensin CRC administration tool."

"Under Cautions: Treatment with Rumensin CRC has no impact on the cure of Johne's Disease, and may have no impact on decreasing the risk of culling in animals diagnosed with Johne's Disease. Treatment with Rumensin CRC is not an alternative to identifying and culling of clinical cases/heavy shedders for effective control of Johne's Disease."

Two studies done in Ontario by Dr. Steve Hendrick, and published in 2006 and 2007, found that cows that received the CRC bolus shed fewer MAP bacteria and were less likely to have a positive test result on a Johne's milk ELISA test. While this improvement in Johne's status may have little importance to the cow herself, a reduction in organism shedding by infected cattle should reduce the infection risk for young stock on infected farms.

Garlic, Papaya and Diatomaceous Earth—Are they Effective in Controlling Gastrointestinal Nematodes in Sheep and Goats?

Jocelyn Jansen, Veterinary Services Unit, OMAFRA

Gastrointestinal nematodes (GIN) are a serious problem affecting sheep and goat production. Compounding the problem, anthelmintic resistance to many of the available conventional, chemical products is on the rise. There is great interest by both organic and conventional producers in alternative deworming options. Three such products are garlic, papaya seeds and diatomaceous earth (DE). Many producers strongly believe in the effects of garlic on GIN control; however, the effects of good nutrition and management are often

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overlooked. Papaya seeds have been reported to have anthelmintic properties when used in mice. DE is fossilized unicellular algae and is said to pierce the outer layer of parasites, causing dehydration and death. Some researchers suspect that the high mineral content in DE earth may be providing some benefit to animals or that DE helps to dry out fecal pellets faster and thereby reduces the number of eggs that develop into infective L3 larvae. There is much anecdotal and testimonial information about the benefits of these products but proof of effectiveness in scientific research is lacking.

A recent US study looked at the effectiveness of a commercially available certified organic garlic product, fresh garlic juice or garlic bulbs as an anthelmintic to control GIN in goats. The authors also investigated papaya seeds for GIN control in lambs. In the first experiment, weaned kids naturally infected with GIN were treated once with a certified organic garlic juice or with water. In the second experiment, weaned kids were treated with freshly squeezed garlic juice or given water on days 0 and 7. A third treatment group grazed garlic bulbs for 3 days and then again on day 7. Fecal egg counts (FECs) and packed cell volumes (PCVs) were measured in both experiments on days 0, 7 and 14 following treatment.

In experiment one, there tended ($P < 0.07$) to be a reduction in mean FECs 7 days post garlic treatment compared to the control group. However, by day 14, FECs between the treatment groups were similar. In experiment two, FECs among all three treatment groups were similar or increased between days 0 and 14. PCVs did not differ among treatment groups in either of the two experiments. In these studies, none of the garlic treatments were effective against GIN in goats.

In a third experiment, lambs still with their dams on pasture were treated with papaya seeds diluted with water or left untreated. Between days 0 and 14, FECs increased in both groups and PCVs decreased. A number of animals in both groups required conventional deworming at the end of the study period due to anemia. In this study, papaya seeds were not effective against GIN in lambs.

In an Iowa State University study, grazing lambs were fed DE at five and ten percent of a supplemental ration for 66 or 117 days in a two-part trial. DE and a commercial lamb feed were made into a pelleted form to minimize dust and palatability issues. Weight gains, PCVs, FECs and abomasal larval counts were not significantly different between DE-fed lambs and control lambs. The researchers concluded that DE used alone was not an effective parasite control agent.

Garlic, papaya and DE are not recommended to be used as a control method against GIN in sheep or goats. A high level of management (animal and environment) and a good understanding of the life cycles of parasites are key to reducing the effects of GIN in small ruminants. Nutrition, fecal monitoring and anthelmintics are additional tools that can be used in a parasite control program.

Burke JM, Wells A, Casey P, Miller JE. Garlic and papaya lack control over gastrointestinal nematodes in goats and lambs. Vet Parasitol 2009; 159:171-174.

Osweiler GD, Carson TL. Evaluation of diatomaceous earth as an adjunct to sheep parasite control in organic farming. Leopold Center Progress Report 95-34, 1997, Iowa State University.

Southern Consortium for Small Ruminant Parasite Control. Parasite Control for Goats: Alternative Dewormers—Do they work? www.scsrpc.org/SCSRPC/Publications/part5.htm

Wells A. Sustainable parasite management for goats. In: Proceedings 20th Annual Goat Field Day 2005:24-33, Langston University, Langston, OK.

Resources

Dairy 2007 study released by USDA

This past fall the Centre for Epidemiology and Animal Health group of USDA published the results of their 2007 dairy study as part of their ongoing National Animal Health Monitoring System. The full results and resulting factsheets can be found at *http://nahms.aphis.usda.gov/dairy/*. The full report provides extensive information on management practices and animal health in dairy herds in the United States, as well as trends and changes over the past 15 years.

Out-of Season Breeding Alternatives for Sheep

This updated OMAFRA factsheet is a good general information source for producers. To obtain a copy, contact Service Ontario online or in person, or phone (416) 326-5300, 1-800-668-9938 toll-free across Canada.

Small Ruminant Veterinarians of Ontario (SRVO)

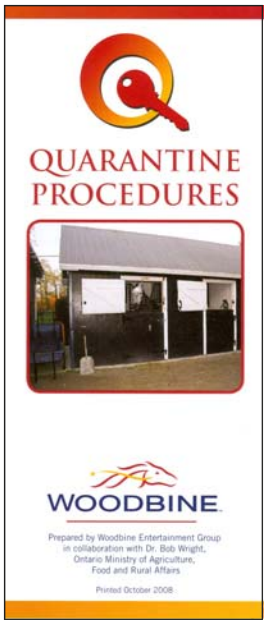
If you are interested in purchasing proceedings of SRVO events or becoming a member of the SRVO, contact Jocelyn Jansen (519) 846-3414, jocelyn.jansen@ontario.ca

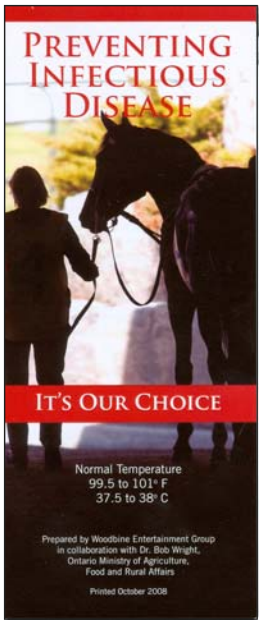
Horses

In collaboration with Bob Wright (Veterinary Services Unit, OMAFRA), Woodbine Entertainment Group has published two new brochures:

- Preventing Infectious Disease—It's Our Choice
- Quarantine Procedures

To obtain copies, contact Bob Wright—robert.wright@ontario.ca or (519) 846-3412.





Continuing Education/Coming Events

Animal Health Laboratory (AHL) Continuing Education Session/Open House in April!

The AHL will be holding an open house focusing on key areas of interest as determined by their practitioner survey during the 2009 OVMA Conference.

Proposed topics include:

- Practical cytology and hematology.
- Fundamentals of sample submission for bacterial culture, interpretation of results, including antimicrobial susceptibility testing.
- Investigation of suspected poisonings.
- Post mortem techniques focusing on appropriate sample submission.
- Application of molecular technology (PCR) and immunohistochemistry to diagnostic testing.

Information regarding the specific times and date will be forwarded shortly.

If you were unable to attend the OVMA conference to fill in their questionnaire, and would like to provide feedback on your particular area of interest, please contact either Dr. Durda Slavic (dslavic@lsd.uoguelph.ca) or Dr. Kris Ruotsalo (kruotsal@lsd.uoguelph.ca).

Continuing Education/Coming Events (continued)

April 1 & 2, 2009	London Swine Conference, London Convention Centre, London, Ontario. *www.londonswineconference.ca*
April 2, 2009	Ontario Association of Swine Veterinarians Meeting—New Problems in Swine Reproduction with Hyper(prolificacy) and Hypo(fertility), Arden Park Hotel, Stratford, Ontario *www.oasv.ca/Meetings.htm*
April 2 & 3, 2009	5th Annual Conference on Organic Dairying and Dairy Research, Alfred Campus, University of Guelph, Alfred, Ontario *http://209.87.235.146/upload/Pages%20from%20depliant-prod-laitiere-Anglais.pdf*
April 30, 2009	Ontario Association of Bovine Practitioners and Ontario Agri-Business Association Joint Spring Meeting—Milking It for All It's Worth, Holiday Inn, Guelph, Ontario. *www.oabp.ca*
May 13, 2009	Sustainable Parasite Management, organized by the Small Ruminant Veterinarians of Ontario, Ontario Veterinary College, University of Guelph, Guelph, Ontario. Contact Jocelyn Jansen (519) 846-3414 or jocelyn.jansen@ontario.ca
May 26-28, 2009	Dairy Herd Management Certificate Program (DHMCP) Update for veterinarians, Lifetime Learning Centre, Ontario Veterinary College, University of Guelph, Guelph, Ontario. The theme will be reproductive management, with featured speakers José Santos, University of Florida .and Mike Overton, University of Georgia. Contact Stephen LeBlanc, (519) 824-4120 ext. 54594, sleblanc@uoguelph.ca
May 31-June 4, 2009	VIIIth International Conference on Pig Reproduction, Banff Centre, Banff, Alberta. *www.icpr2009.com*
June 3-5, 2009	2009 World Pork Expo, Iowa State Fairgrounds, Des Moines, Iowa. *www.worldpork.org*
June 3-6, 2009	2009 ACVIM Forum & Canadian Veterinary Medical Association Convention, Palais des Congrès de Montréal, Montreal, Quebec. *www.acvimforum.org*
June 24 & 25, 2009	Ontario Pork Congress, Stratford Agricultural and Recreational Complex, Stratford, Ontario *www.porkcongress.on.ca*
July 6-10, 2009	43rd Congress of the International Society for Applied Ethology, Cairns Convention Centre, Cairns, Australia. *www.isae2009.com*
July 7-9. 2009	International Conference on Bovine Mycoplasmosis, Saskatoon, Saskatchewan. *www.bovinemycoplasma.ca*
September 20-24, 2009	International Dairy Federation World Dairy Summit, Maritim Hotel Berlin, Berlin, Germany. *www.wds2009.com*
November 12 & 13 2009	Dairy Cattle Reproduction Council regional meeting, Crowne Plaza-Riverfront, St. Paul, Minnesota. *www.dcrcouncil.org*
November 19 & 20 2009	Dairy Cattle Reproduction Council regional meeting, Doubletree-Riverside, Boise, Idaho *www.dcrcouncil.org*
July 18-21, 2010	21st International Pig Veterinary Society Congress, Vancouver Convention and Exhibition Centre, Vancouver, British Columbia. *www.ipvs2010.com*
November 14-18, 2010	26th Congress of the World Association for Buiatrics, Santiago de Chile, Chile. *www.buiatrics.com*

WE ARE MOVING!!!

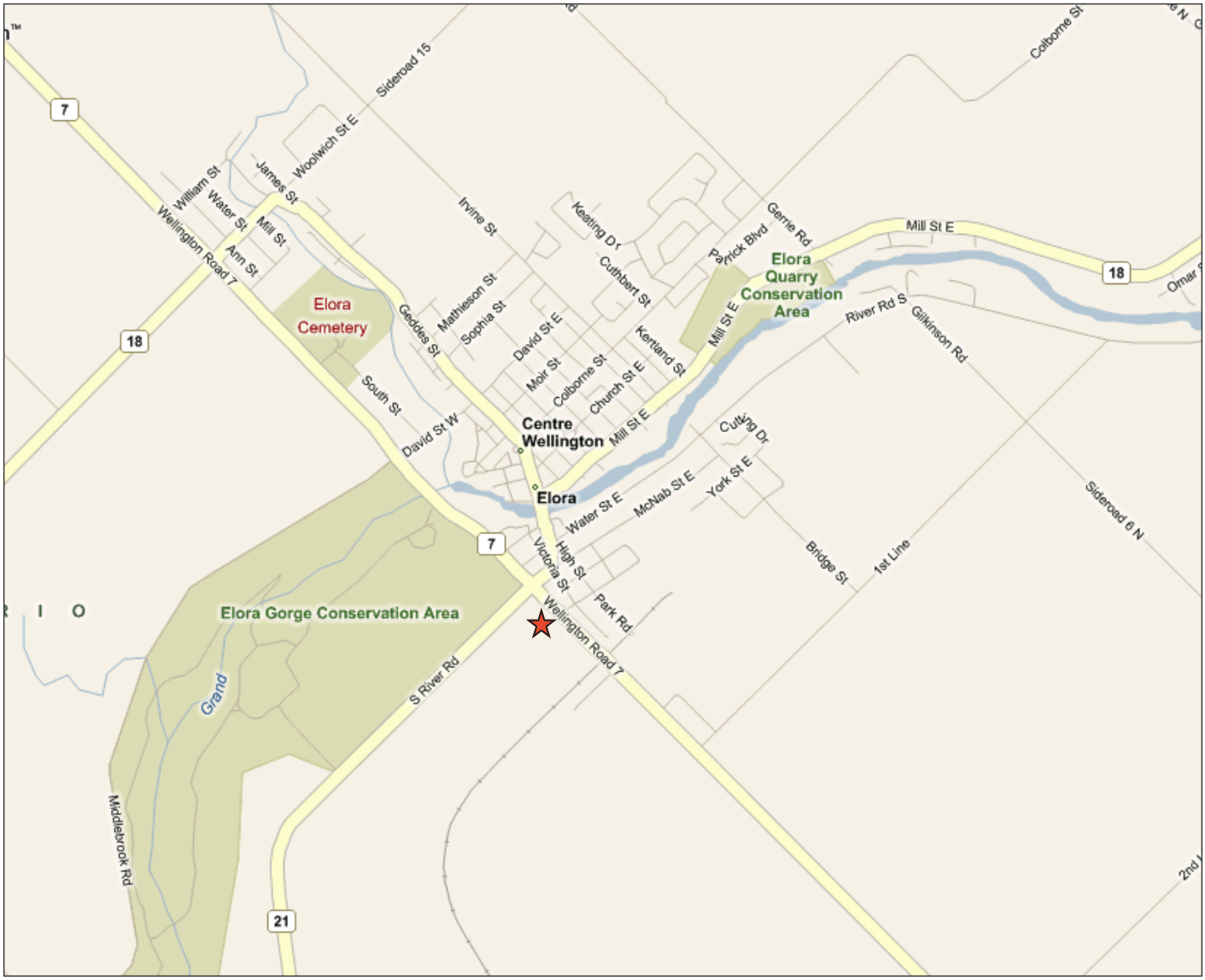
Effective March 30, 2009

Our new address will be

6484 Wellington Road 7, Unit 1
Elora, Ontario N0B 1S0

Telephone numbers for staff will remain the same.

The fax number will change to (519) 846-8178.



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Ann Godkin, Veterinary Services Unit, Ontario Ministry of Agriculture, Food and Rural Affairs
Unit 1, 6484 Wellington Road 7, Elora, ON N0B 1S0
Tel.: (519) 846-3409 Fax: (519) 846-8178 E-mail: ann.godkin@ontario.ca

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Deadline for next issue: May 15, 2009

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Ministry of Agriculture, Food and Rural Affairs

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