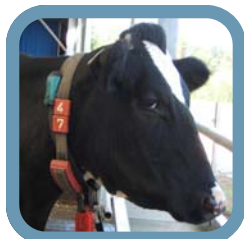


**Serving Ontario through veterinary science, technology transfer,  
outbreak investigation and animal health surveillance**



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### How did we let her down?

*Jennifer Walker, Director of Dairy Stewardship, Dean Foods, Dallas, Texas*

*Tim Blackwell, Veterinary Science and Policy Unit, OMAF and MRA*

We put the cow up on the tilt table to see why she was lame. The hard, suppurative swelling extended from the coronary band to above the fetlock. “How did we let this cow down?” I asked. “What do you mean?” asked the owner. “This cow gave us four outstanding lactations and we allowed this to happen?” The

owner was quiet for several minutes and then quietly said, “I see what you mean.”

The dairy industry is unique in producing a food that is associated with maternity rather than slaughter. The dairy brand depends on trust and is founded on images of contented cows overseen by caring stock people. This image, envied by other livestock commodities, has become the target of organizations who want to limit our ability to benefit from animals in agriculture. By capitalizing on those moments when we “let her down,” these groups try to tarnish the public’s image of farmers and foods of animal origin. It is critical that livestock producers and veterinarians do not allow this to happen. We succeed if we consistently demonstrate that our cattle receive, in a timely manner, the care and respect they deserve. We will fail if we resort to futile efforts to defend actions that do not demonstrate the care and respect the public has entrusted us to provide.

The cows in our barns consistently perform to the best of their abilities within the constraints of their environment. They do their part and we must ensure that we reciprocate by doing our best to make the right decisions in a timely manner on their behalf. If the close bond between stock people and their cows is not readily apparent to consumers, we place the much coveted dairy brand at risk. Cull cows are a public display of dairy husbandry. They can be either a highly visible testament to the outstanding husbandry ethic of their caretakers or an example of our failure to do our best, and thus can become a threat to the dairy brand. If the condition of cull cows is not consistent with the image of maternal care and contentment that is the very image of the dairy industry, then the good name of dairy farming is put at risk along with the livelihood of farmers.

*(Continued on page 3)*

**Ceptor is published by:** Veterinary Science and Policy Unit,  
OMAF and MRA

**Editor:** Ann Godkin

Graphics, layout and editing support provided by  
Ora Zondervan, Regional Economic Development Branch

**Website:** [www.ontario.ca/livestock](http://www.ontario.ca/livestock)

**Archived Issues of Ceptor:** [www.oabp.ca](http://www.oabp.ca)

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There are efforts in many jurisdictions to prevent activists from filming cattle and cattle handling on farms, in sales barns or in slaughter establishments. These preventive efforts are motivated by the fear that the misrepresentation of cattle husbandry practices, or the (goading?) coercion of individuals to treat animals inhumanely, will damage the industry. The cows we willingly send through sale barns however are neither a misrepresentation nor a result of coercion. They are a genuine reflection of our care and attention. Sale-barns are public places where access is unrestricted and where the public can get a first-hand view of how we care for cows. We must keep this fact constantly in mind.

Once we understand the risk, we need to identify the root issue. Why do cull cows sometimes appear as poor examples of the actual care they received over their lifetimes on a farm? It is natural to focus our efforts on the cattle that are in that part of their production cycle that requires extra attention, whether transition cows or those in the breeding and maternity pens. As a consequence, less attention is invested in those animals that will soon be exiting the herd. Our treatment decisions are impacted on by the necessary withdrawal times required for therapeutic or pain relieving medications and this can restrict our ability to treat a condition in a cull cow or calf. These are two of many reasons why cull cows sometimes appear as poor examples of the

level of care provided on a farm, but they are not legitimate excuses for making poor removal decisions.

There is an implicit contract we enter into when we raise animals for food. Every cow, especially a cull animal, should be afforded the full measure of care and respect she has earned. What does respect for that implicit contract look like? It is this: we owe them a humane life and a humane death. This includes ensuring that they do not suffer as a result of being too thin, too weak, too sick or too lame by the time we remove them from the herd. The risks associated with marketing cattle at the end of their productive lives in ways that do not accurately represent the husbandry practices on the farm are too great to ignore. Once trust in a brand is lost, it can be near impossible to regain.

We must realize that the public views our dairy cattle at the end of their productive lives as a reflection of the care they received from us along their entire productive journey; as a public display of our commitment to good husbandry. We producers and veterinarians have the tools and information to make the right decisions. When our cull animals do not accurately represent the care and attention they received on our farms, we do ourselves, our industry, and our cows a disservice.

## Usability of Advice: Feed More Milk to Calves

Neil Anderson, Veterinary Science and Policy Unit, OMAF and MRA

Usability is the ease of use of something that humans interact with. This may be a smart phone or a process, like feeding more milk to calves. Although *feed more milk* is a helpful suggestion, it's not necessarily user friendly. The advice becomes more functional when it includes information about tools, savings of time, ease of learning, and worker satisfaction.

For example, producers provide fresh warm milk to their calves at the morning and evening milking because warm milk is readily available. That's not the case at noon when milk must be heated to feeding temperatures of 39°C. Calf milk heaters (e.g., DeLaval calf milk heater CMH 2300) are seldom seen in Ontario. The newest versions have automatic temperature controls and Teflon coatings for ease of cleaning. Without a heater, milk replacer is a practical alternative to whole milk for a noon feeding. A milk powder with 22-28% Protein and

17-18% Fat, mixed 150g into a L of water will give solids content similar to whole milk. 'Personal size' nipple-pails may be time-savers because they are easier to clean than nipple bottles, hold more generous volumes of milk, and provide the benefits of suckling to calves.



Figure 1. Personal size nipple pails for individual calves.

Three suggestions enhance user friendliness and usability for caregivers of our advice, *feed more milk to calves*. That may be all it takes to see adoption and compliance.

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# A New Ceptor Feature

## Herd Health

Veterinarians know the frustration of being called to a herd health problem whose solution requires in part a change in farm habits. “But we’ve always done it that way.” is a line that makes even the most experienced practitioner shudder.

Whether feeding, sanitation, handling, or some other procedure, old habits die hard. It is particularly hard for clients to accept that a standard farm practice is related to an increase in morbidity or a decrease in productivity in the herd. How do we encourage change in standard farm practices without causing offense?

Some practitioners have developed approaches that are more successful than others at facilitating change in farm management. This new feature is intended as a forum for sharing experiences in herd health management. A case study supplied by readers and focusing on herd health management will be presented in each issue and suggested responses to the previous case will be printed alongside. Readers are encouraged to submit cases for publication and suggestions for solving the previously published case.

The inaugural case is presented below by Dr. Neil Anderson.

Your dairy producer client estimates treatment rates of 85% and mortality of 10% in his milk-fed calves in a new nursery barn. You suspect that both estimates are low. He describes signs of respiratory disease in calves one to five days of age, sometimes with diarrhea. Almost all calves are given four litres or more of colostrum by esophageal feeder. There are two or more people in charge of calf care. You have no recent postmortem or diagnostic reports. However, you had diagnostic reports from one or two years ago that showed fat globules in the lungs from a few calves submitted for post mortem. He believes that failure of passive transfer is the problem and he ensures that all calves get lots of colostrum shortly after their birth. You believe that caregivers are causing harm with the esophageal feeder but you haven’t been successful at convincing the owner. What should you do?

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## Porcine Epidemic Diarrhea Virus- Preventing it from Entering Canada

*Alena Felkai, Veterinary Student at the University of Sydney and  
OMAF and MRA Student Placement*

*Tim Blackwell, Veterinary Science and Policy Unit, OMAF and MRA*

Porcine Epidemic Diarrhea virus (PEDv) is a member of the *Coronaviridae* family. Infection is specific to swine and results in severe diarrhea and vomiting in pigs of all ages.<sup>(3)</sup> PEDv causes essentially 100% mortality rate in piglets less than three weeks of age but pigs over four weeks of age generally survive the infection.

In the United States, PEDv outbreaks started in April 2013 and have now affected 17 states. As of October 1<sup>st</sup> 2013, over 600 farms are considered infected.<sup>(2)</sup> The virus is transmitted between pigs and farms via contact with infected feces. As Ontario

producers ship live pigs, hogs, and cull sows to the United States on a regular basis, there is a risk of contaminated trucks and equipment returning to Canada to introduce PEDv.

PEDv does not cause any human health concerns or food safety issues.<sup>(1)</sup> PEDv is not a federally reportable or immediately notifiable disease.<sup>(1)</sup> However, to prevent it from entering Canada and to continue to monitor Canada’s PEDv-free status, both the Canadian federal and provincial governments are

*(Continued on pages 5)*

strongly encouraging veterinarians, producers and service industry employees to adhere to strict biosecurity protocols. If an outbreak of diarrhea with high morbidity and mortality is observed on a farm, appropriate samples should be sent to the Animal Health Laboratory at the University of Guelph to confirm the etiology.

For more information on PEDv, please visit the following links:

#### **National PEDv Strategy**

[www.swinehealth.ca/PED-Alert.php](http://www.swinehealth.ca/PED-Alert.php)

#### **PEDv Biosecurity**

[www.pork.org/News/3904/](http://www.pork.org/News/3904/)

[NationalPorkBoardStatementOnPEDV.aspx#.UcSTro9zaM8](http://NationalPorkBoardStatementOnPEDV.aspx#.UcSTro9zaM8)

[www.pork.org/Research/2641/ResearchLatestNews.aspx](http://www.pork.org/Research/2641/ResearchLatestNews.aspx)

#### **Diagnostic samples for PEDv**

[www.guelphlabservices.com/files/AHL/AHL%20LabNotes/LabNote%2024%20PEDV%20Diagnostics%20AHL%20Aug82013FN.pdf](http://www.guelphlabservices.com/files/AHL/AHL%20LabNotes/LabNote%2024%20PEDV%20Diagnostics%20AHL%20Aug82013FN.pdf)

#### **PEDv Fact sheets and General Information**

[www.aasv.org/aasv%20website/Resources/Diseases/PorcineEpidemicDiarrhea.php](http://www.aasv.org/aasv%20website/Resources/Diseases/PorcineEpidemicDiarrhea.php)

#### **PEDv Updates**

[www.farmscape.com/f1Scripts.aspx?m=SEARCH&p1=PED](http://www.farmscape.com/f1Scripts.aspx?m=SEARCH&p1=PED)

#### **References:**

1. *Pospichil A, Stuedli A, Kimpel M. Update on porcine epidemic diarrhea. Journal of Swine Health Production, 2002; col. 10, no. 2:81-85.*
2. *Gillam C, Huffstutter PJ. Oklahoma winds may spread deadly swine virus. Pork Network, (Viewed September 30<sup>th</sup> 2013) [www.porknetwork.com/e-newsletters/pork-daily/Oklahoma-winds-may-spread-deadly-swine-virus-224569051.html#sthash.AOZEVLab.dpuf](http://www.porknetwork.com/e-newsletters/pork-daily/Oklahoma-winds-may-spread-deadly-swine-virus-224569051.html#sthash.AOZEVLab.dpuf)*
3. *Canadian Food Inspection Agency (CFIA). Federally Reportable Diseases for Terrestrial Animals in Canada- 2013, Government of Canada, (Viewed September 30<sup>th</sup> 2013) [www.inspection.gc.ca/animals/terrestrial-animals/diseases/reportable/2013/edg/1329499145620/1329499272021](http://www.inspection.gc.ca/animals/terrestrial-animals/diseases/reportable/2013/edg/1329499145620/1329499272021)*

## **Air Movement in a Slatted Floor Calf Nursery**

**Neil Anderson, Veterinary Science and Policy Unit, OMAF and MRA**

**Harold House, Innovation, Engineering and Program Delivery Unit, OMAF and MRA**

Today, ‘smoke and mirrors’ often refers to the work of spin doctors plying their craft of deception. Nonetheless, smoke also has the potential to inform rather than mislead. This report describes a few smokin’ revelations while investigating ventilation in a new slatted floor calf nursery. Unacceptable treatment and death rates were primary reasons for the investigation.

Our equipment included cell phones for inside to outside communication, digital still and video cameras, ladders, garden insect foggers, and aviation smoke oil ([www.aircraftspruce.ca](http://www.aircraftspruce.ca)).

Briefly, the barn had a curtain wall on one side and four exhaust fans on the opposite wall, two positive pressure tubes (PPT), and air inlets along the cathedral ceiling. All operated with an automated controller system. The photographs in this report were taken with all fans on and the curtain open about 12 inches; the way we found the barn upon

our mid-morning arrival. The curtain side had group pens bedded with straw. The fan side had two rows of individual calf pens with three solid sides and straw bedding. A solid floor separated the two halves of the barn.

In the group pens, smoke was infused through a floor slot into the pit beneath the floor near one end of the barn. Of course, some smoke rose up at this location. However, in a few minutes smoke emissions progressed to the opposite end of the barn (**Figure 1a**). Moreover, smoke moved into the bedded pens (**Figure 1b**). Smoke began to clear at the feed bunk (manger) wall and progressed across the slatted floor into the pens (i.e., the direction of flow of the smoke). This flow pattern was opposite to the flow of air entering through the curtain opening.

*(Continued on page 6)*



Figure 1a



Figure 1b



Figure 1c

Individual pens were built on top of the slatted floor and aligned head-to-head with a service alley for separation. Smoke was infused through a slot in the walk alley. As in the group pen section, smoke emissions progressed along the length of the slatted floor (**Figure 1c**). Smoke emissions rose up through the floor within empty pens and in pens with scant straw bedding.

Other demonstrations, with various combinations of system settings, showed air patterns with smoke infused through the opening in the curtain wall or into the inlets for the PPT's. For example, smoke was infused along the opening at the top of the curtain wall. This smoke followed the ceiling line without dropping into the group pens. The PPT acted as a baffle, interfering with the flow of smoke along the ceiling and forcing smoke downwards into the path of air exiting the PPT. Some of this smoke was redirected towards the feed manager and some was drawn towards the exhaust fans.

Smoke patterns showed that air moved:

- horizontally under the slatted floor towards the opposite end of the barn (e.g., along the surface of the slurry in the pit)
- vertically up through the floor slots
- from the slatted floor into the pens and
- that smoke began to clear at the bunk.

Evaporation (a natural occurrence) fosters the escape of microscopic droplets of moisture containing entrapped bacteria and other contaminants from the surface of slurry in the pit. These droplets may be hazards for respiratory disease. Smoke tests showed how the ventilation system assisted movement of air up out of the pit and into the pens.

The 'sniff test', the feeling of air movement and the drone of fans gave a sensory illusion of excellent air quality and ventilation upon entering the barn. Regrettably, our organoleptic tests were conducted at the wrong location. We should have lain with our heads upon the beds or slatted floors to get a calf's perspective. Slatted floor barns may not be suitable for rearing calves, especially in combination with forced air ventilation systems. But the barn is built; calves are getting sick, being treated and dying. Do you recommend returning to hutches, installing solid floors and alternate manure handling, venting the pit or changing the ventilation system?

### Acknowledgements

A willing dairy producer and the supplier of the ventilation equipment made this report possible during a collaborative investigation.

# Biosecurity for *Salmonella Dublin*: A Case in Progress

Neil Anderson, Veterinary Science and Policy Unit, OMAF and MRA

An astute Quebec veterinarian heeded and responded to multiple alerts and notices about *Salmonella Dublin* (*S. dublin*) that were issued by Quebec's provincial agricultural ministry (MAPAQ) since 2011. He advised, and his client complied with, immediate quarantine and testing of dairy calves that were transported by an Ontario trucker from Iowa to the client's farm in late September. Within 10 days the veterinarian had a laboratory report showing a positive culture for *S. dublin* from one of the calves. The practitioner immediately notified MAPAQ. The positive calf was voluntarily euthanized. The same day, samples were collected from the remaining calves and submitted for repeat testing. The plan was to test these four times in the next seven days. Moreover, although sero-conversion of cows may not have happened in the short time since arrival of the calves, a bulk tank milk sample also was collected for testing.

None of the transported calves showed signs of illness upon arrival or during their stay in the farm's quarantine barn while the owner waited for the laboratory report. The quarantine barn is a separate building located about 60-90 metres from the dairy barn.

Section 3 of the Reference Manual for Canadian Quality Milk (CQM) contains best management practices for prevention of introduction of infection by cattle additions. Only a few infectious agents are listed and *S. dublin* isn't one. That's understandable because it is an emerging threat in both Quebec and Ontario. It's a very good idea to develop Standard Operating Procedures (SOPs) for biosecurity relating to new introductions to the herd, following the Best Management principles. The new Dairy Biosecurity Standards may provide some guidance as well. [www.inspection.gc.ca/animals/terrestrial-animals/biosecurity/standards-and-principles/dairy-farms/eng/1359657658068/1359658301822](http://www.inspection.gc.ca/animals/terrestrial-animals/biosecurity/standards-and-principles/dairy-farms/eng/1359657658068/1359658301822)

While some believe that SOPs are static, emerging diseases, changing farm practices and cattle movement patterns should convince us to view SOPs as living documents. Routine review should occur and modifications should be made as needed. The reports of *S. dublin* diagnoses in Quebec motivated the practitioner to assist his client with biosecurity protocols.

MAPAQ officials suspected calves from the same transport truck may have offloaded at other farms in Quebec or Ontario. Subsequently, the transporter confirmed the delivery of calves to an Ontario farm. Precautions about biosecurity, cleaning of trailers and risks to human health were given to the transporter.

OMAF and MRA staff contacted the Ontario producer's veterinarian. The conversations included items about biosecurity, human health, testing protocols and assistance with laboratory services. The veterinarian reported that his client received his animals and placed them in pens adjacent to maternity and fresh cow pens. There was no protocol for quarantining or testing new arrivals. Several cows aborted around the time of arrival of the heifers from the USA. At this time in November, neither feces from the calves nor bulk tank milk have been tested for *S. dublin*.

Our thoughts should turn to our clients and their recent purchases, and to our duty of care. We can use our knowledge about spread of infection, viability of the organism in the environment, disposal of the euthanized calf and the contaminated bedding, cleaning and disinfecting procedures for the quarantine barn, and potential risks to human health to help our producers.

*(With files from Janet Alsop, Veterinary Services Unit, OMAF and MRA)*

# Ontario Johne's Education and Management Assistance Program: Is Removing your High-Titre, Johne's-Positive Cow a Good Financial Move?

Taika von Konigslow, Ontario Veterinary College, University of Guelph, Class of OVC 2015

David Kelton, Department of Population Medicine, University of Guelph

Karen Hand, Strategic Solutions Group

Nicole Perkins, Ontario Johne's Education and Management Assistance Program

As of the end of May 2013, 153,736 cows in 2,339 herds had been tested as part of the Ontario Johne's Education and Management Assistance Program. Of the cows tested, 1% (1,595 cows) had test-positive results for *Mycobacterium avium paratuberculosis* (MAP) antibody on the milk ELISA test done at CanWest DHI. Of all the test-positive cows, a much smaller group (243 cows, 15%) had a Johne's test result of 1.0 or higher ("High-Titre" cows) showing them to be high risk for shedding MAP into the environment. Of these High-Titre (HT) cows, 67% (163 cows) were voluntarily removed from their herd as required for full compliance with the program. To assist with management changes, producers were compensated with a one-time payment of \$500 per HT cow removed.

To estimate the average cost of removing and replacing the HT cows identified in this program, we used the "Cow Value" module of Dairy COMP 305 (COWVAL). COWVAL is used to estimate the net present value of a cow relative to an average replacement heifer on that farm.<sup>(1)</sup> For example, an average replacement heifer on any given farm is set to a baseline cow value of \$0. A cow in that same herd with a cow value greater than \$0 would be more profitable to keep in the herd than to replace with a heifer at that time. If another cow in that herd had a cow value less than \$0, it shows that it would be more profitable to replace her with a new heifer. COWVAL estimates are cow and farm specific and change over the lifetime of a cow.<sup>(1)</sup> Factors that influence COWVAL estimates include input costs, productivity and reproductive status.<sup>(1)</sup>

When we generated COWVAL estimates for the HT cows in the herds where the HT cows originated, we found the median COWVAL estimate for HT cows in those herds to be \$700, with a range from -\$1400 to >\$2000. By comparison, all test-POSTIVE cows

had a median COWVALU of \$800 and test-NEGATIVE herd mates had a median COWVALU of \$1200. Almost 40% of HT cows had a COWVAL <\$500, meaning the cost of replacing these cows was below the \$500 compensation given to producers who removed HT cows. Nonetheless, **on average** it still cost producers \$200 per HT cow at the time they removed these cows.

COWVAL is one way of estimating the cost of replacement. However, other factors often need to be considered when making replacement decisions, depending on the disease of interest or the reason for cow removal. In the case of Johne's, not only have studies shown that HT and positive cows have lower milk production than their test-negative counterparts,<sup>(2)</sup> but keeping HT cows puts the rest of the herd at an increased risk of becoming infected as these cows are actively shedding MAP bacteria. Keeping HT cows in the herd slows the rate of Johne's reduction for the entire herd.

In this phase of the program, two-thirds of the producers did the right thing by removing HT cows from their herd. By doing so, they made an investment in the overall health of their herd. Removal after finding a Johne's HT score is a short-term investment with long-term benefits, both to the health of their herd and to that of the dairy industry as a whole.

1. Sorge US, Kelton DF, Lissemore KD, Sears W, Fetrow J. Evaluation of the Dairy Comp 305 Module "Cow Value" in Two Ontario Dairy Herds. *J. Dairy Sci.* 2007;90 (12): 5784-5797.
2. Sorge, US, Lissemore K, Godkin A, Hendrick, S, Wells S, Kelton D. Associations between paratuberculosis milk ELISA result, milk production, and breed in Canadian dairy cows. *J. Dairy Sci.* 2011;94:754-761.



# Dissemination of *Mycobacterium avium* subspecies *paratuberculosis* to Muscle and Blood in Sheep

Jocelyn Jansen, Veterinary Science and Policy Unit, OMAF and MRA

The role of *Mycobacterium avium* subsp. *paratuberculosis* (MAPMAP) in human Crohn's disease remains uncertain. However, decreasing human exposure to MAPMAP is a reasonable precautionary measure. Potential sources of exposure for humans to MAPMAP are contaminated water, milk or meat. A 2010 Canadian study of cows with advanced Johne's disease (clinical cases) found evidence of MAPMAP dissemination beyond the intestinal tract (liver, kidney, skeletal muscle, lymph nodes). Similar findings were detected in a small US study of pygmy goats.

Recently, a New Zealand study examined 51 ewes of various ages that were in poor body condition (average 1.5 out of 5) and were culled from a flock with a history of clinical Johne's disease. Blood samples were taken from each ewe. At necropsy, samples of skeletal muscle (biceps femoris), ileum and mesenteric lymph nodes were also collected. All samples were cultured using the BACTEC system. Ewes were classified as having "confirmed Johne's disease" if there was histopathological evidence typical of the disease within the ileum and adjacent lymph nodes.

Disseminated MAP infection was found in ewes with and without Johne's disease. Twenty-one ewes were confirmed as having Johne's disease. Of those, 71%

(15/21) and 62% (13/21) had positive culture results for MAP from skeletal muscle and blood, respectively. In the 30 ewes without histological evidence of Johne's disease, 13% (4/30) and 3% (1/30) had positive culture results from skeletal muscle and blood, respectively. Overall, 86% (18/21) of ewes with Johne's disease and 17% (5/30) of ewes without had MAP infection detected outside the intestinal tract.

The overall risk to humans from consumption of MAP-positive animal products is unknown. The risk of human exposure to MAP appears to be higher from animals showing clinical signs (diarrhea, weight loss/wasting) of Johne's disease. The results of this New Zealand study support the precautionary measure of removing advanced cases of Johne's disease in ruminants from the food chain. Pasteurization of raw milk and thorough cooking of meat prior to consumption significantly reduces the number of MAP bacteria.

*Smith SL, et al. Detection of Mycobacterium avium subsp. paratuberculosis in skeletal muscle and blood of ewes from a sheep farm in New Zealand. N Z Vet J 2011;59(5):240-243.*

*Mutharia LM, et al. Mycobacterium avium subsp. paratuberculosis in muscle, lymphatic and organ tissues from cows with advanced Johne's disease. Int J Food Micro 2010;136:340-344.*

## Accessibility: Simultaneous Feeding at a Bunk for Dairy Heifers

Neil Anderson, Veterinary Science and Policy Unit, OMAF and MRA

Accessibility usually focuses on the ability of people with special needs to access resources. Let's consider students needing food at a meeting of the University of Guelph Dairy Science Club. Pizzas arrived and were placed on a portion of the front desk in the lecture hall. Lineups (e.g., poor access) at the pizza bunk resulted in some students coming away with one to four slices (e.g., food obtainable). However, students towards the end of the lines returned empty handed. They ate later from a second order. This may not happen at a heifer feed bunk. For heifers, accessibility is the ability to simultaneously access a feed bunk and obtain feed in it. Eight heifers in a pen with ten lockups at the bunk

may seem like good access. But obtainability is restricted by placing grain in front of only five lockups and by offering a limited amount of grain. A risk exists for both aggressive (e.g., gorge feeding) and timid (e.g., hunger) heifers. Accessibility is best with grain in front of all ten lockups. For limit-fed heifers, accessibility is a place for every heifer at the feed bunk and feed within reach.

Here's a suggestion for reading.

*Thesis: Factors Affecting Feeding Behaviour in Limit-Fed Dairy Heifers by A.M. Greter, University of Guelph, 2013. [https://dspace.lib.uoguelph.ca/xmlui/bitstream/handle/10214/4928/Greter\\_Angela\\_201212\\_PhD.pdf?sequence=3](https://dspace.lib.uoguelph.ca/xmlui/bitstream/handle/10214/4928/Greter_Angela_201212_PhD.pdf?sequence=3)*

# **PRO-DAIRY e-Alert: Gypsum Bedding in Bedded Pack Barns May Also Create Dangerous Conditions**

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**Tom Eskildsen, Yates SWCD**

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**Karl J. Czymmek, Cornell PRO-DAIRY**

Bedded pack manure storages can produce dangerous levels of manure gases, including hydrogen sulfide, especially when gypsum or other sources of available sulfur are used as bedding.

## **Dangerous Levels Have Been Measured!**

Last week we reminded farmers and manure handlers that all stored manure can produce hazardous gases at levels of concern in some conditions. Some of these gases (like hydrogen sulfide (H<sub>2</sub>S)) are toxic and heavier than air and therefore are prone to sink to low areas like storage pits, sumps, or other depressions and accumulate to potentially *LETHAL* levels.

We also reported specifically on concerns we have with possible increased risk for exposure to high levels of H<sub>2</sub>S from long-term liquid manure storages used to store manure from barns where gypsum is used for cow bedding. These concerns are based on recent measurements taken by staff from the Benton fire department and the Yates County Soil and Water Conservation District (SWCD) where greater than 100 ppm H<sub>2</sub>S was measured at the edge of a long-term liquid manure storage structure. This level is identified as immediately dangerous according to the US Occupational Safety and Health Administration (OSHA).

The Yates County measurements are consistent with reports of high levels measured on at least one Pennsylvania farm where gypsum also was used for bedding and manure was stored. Gas concentrations are rapidly diluted with distance from the storage structure, so there should be little or no concern during agitation or clean out beyond the immediate

farmstead.

## **What's New?**

Since last week it has come to our attention that gypsum is also being used by some New York State farmers as a bedding material *in deep bedded pack barns*. Deep bedded pack systems have the same anaerobic (little or no oxygen) conditions as long-term liquid manure storages – the conditions needed for the formation of H<sub>2</sub>S by microbes.

Therefore, the potential for human exposure to high levels of H<sub>2</sub>S is possible with bedded pack situations as well as long-term liquid manure storages. In fact, the opportunity for a farmer to be exposed to high levels of H<sub>2</sub>S may possibly be even higher with bedded packs, especially during clean-out. The packs are normally under roof, and enclosed barns may not provide enough air movement to maintain safe working conditions.

Late last week, staff from the Benton fire department and Yates County Soil and Water Conservation District (SWCD) measured more than 100 ppm H<sub>2</sub>S in a barn where a deep bedded pack was being removed. Once again, gypsum had been used as part of the overall bedding material.

As a reminder, human exposure to hydrogen sulfide levels above 20 ppm can cause headaches, dizziness, and fatigue. According to OSHA, a concentration of 100 ppm H<sub>2</sub>S is immediately dangerous to life and health because the symptoms can make it difficult or impossible to escape from a dangerous situation.

*(Continued on page 11)*

Levels over 100 ppm paralyze the olfactory nerve (sense of smell) causing the victim to not know they are breathing in the gas, and exposure at this level for 48 hours may cause death. At levels above 500 ppm, staggering and collapse can occur in 5 minutes, death after 30-60 minutes. Since we are finding random air samples over 100 ppm H<sub>2</sub>S, it is possible to have pockets of H<sub>2</sub>S near or in storage/bedded pack structures during agitation or clean-out that are at much higher levels.

*Farmers, family members, workers, and visitors are urged to avoid any and all manure gases, especially from long-term storages or bedded packs where gypsum is mixed in with manure in any significant quantities. Note: for operations that daily haul manure and use gypsum for bedding, we expect little or no production of H<sub>2</sub>S, but care should be taken to minimize risks here too.*

When cleaning out a barn's bedded pack manure:

- Make sure no unnecessary people are near the pack, especially at the location where the pack is being removed.
- If hand clean-out is required using pitchforks, consider wearing a belt-mounted personal gas exposure alarm system to alert you if exposure is exceeding safe limits.

- Open all barn doors, windows, curtains and any other air inlets/outlets if the barn is naturally ventilated or turn on the mechanical ventilation system to full capacity before beginning the clean out process.
- Set up large fans and/or blowers around where operators will be working to mix air and dilute any gases.

In conditions where sufficient ventilation cannot be achieved, equipment operators properly trained on use of a respirator and who are wearing them should be the only ones working in the barn when clean out is occurring. In addition to the above, farmers should:

- Consider using other materials for bedding until this issue is better understood.
- Have an emergency plan in place.
- Train all family members and employees in the dangers of manure gases.

**Web site:** [www.manuremanagement.cornell.edu/Pages/Topics/Safety.html](http://www.manuremanagement.cornell.edu/Pages/Topics/Safety.html)

An outbreak of hock sores followed within a month of a change in quality of ‘sawdust’ spread on PastureMat® Plus beds in a dairy barn. The sawdust contained more and larger wood chips than previous loads from the supplier. The abrasive bedding was swept from the beds and replaced with peat moss.

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An Eastern Ontario dairy producer has been using a DeLaval CF150X automated feeder successfully for feeding acidified milk replacer. A heat chamber warms cool or cold acidified milk or milk replacer to feeding temperature prior to a calf suckling. The machine eliminates problems of clotting with warm acidified milk and low milk intakes because of cold milk temperature.

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Klebsiella mastitis is a “hot” topic this summer and fall. One producer with an exceptionally well managed scrape alley barn has reported that a thorough washing of the hind legs of the cows below the hocks with warm water diminished new cases of clinical mastitis almost immediately and this effect lasted up to 14 days. This gives a new meaning to the term “foot bath” and a new reason to do it well.

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## Time to Check Electric Cow Trainers

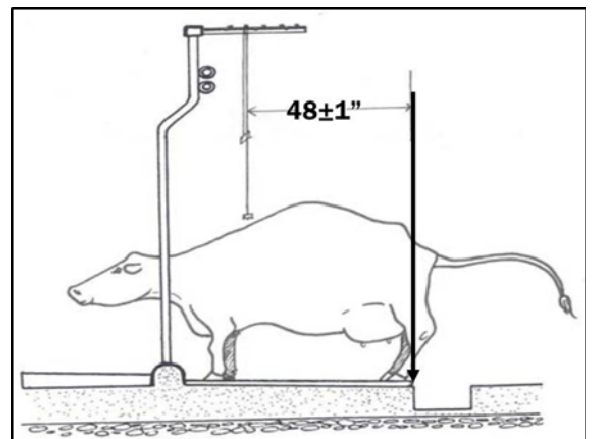
It’s that time again.

No, not shopping season, although that’s happening for some folks.

It’s time to check the electric cow trainer position in tie-stall barns. In general, the horizontal location should be  $48 \pm 1$  inch forward of the gutter curb for Holsteins and  $40 \pm 2$  inches for Jerseys. The bar should be two (2) inches above the chine for training (e.g., about 24 hours) and four (4) inches for maintenance. The energizer must be less than 2500 volts and grounded to two rods outside the barn. The trainer must be adjustable in height and in fore and aft location.

For ease of measurement, use a plumb-bob to mark the location on the bed. For veterinary practices, this check could be a service provided by your veterinary technician.

For your clients, the rewards will be better cow and udder cleanliness, and demonstration of estrous.



**Figure 1.** The trainer is located safely above the cow's chine when she stands back in the stall, arches her back and urinates in the gutter.



### **Ontario Ministry of Natural Resources**

The latest issue of the Rabies Reporter (Volume 24, Number 3) is now available on the Ministry of Natural Resources website at [www.mnr.gov.on.ca/en/Business/Rabies/2ColumnSubPage/196811.html](http://www.mnr.gov.on.ca/en/Business/Rabies/2ColumnSubPage/196811.html)

Visit the Rabies in Ontario website to learn more about the rabies control programs at [www.ontario.ca/rabies](http://www.ontario.ca/rabies)

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### **Horse Report**

Published by the Center for Equine Health, School of Veterinary Medicine, University of California, Davis

The July issue of Horse Report, **Transporting Horses by Road and Air: Recommendations for Reducing the Stress** is now available on the Center for Equine Health's website at [www.vetmed.ucdavis.edu/ceh/previous.cfm](http://www.vetmed.ucdavis.edu/ceh/previous.cfm)

The October issue, **Caring for Horses Through Life and Death**, can be found at [www.vetmed.ucdavis.edu/ceh/current.cfm](http://www.vetmed.ucdavis.edu/ceh/current.cfm)

Additional issues of the Horse Report are available on the same website at [www.vetmed.ucdavis.edu/ceh/previous.cfm](http://www.vetmed.ucdavis.edu/ceh/previous.cfm)

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### **Part IV: Health and Health Management on U.S. Feedlots with a Capacity of 1,000 or More Head**

USDA's National Animal Health Monitoring System (NAHMS) has posted the fourth report from the Feedlot 2011 study. The study took an in-depth look at large U.S. feedlots (1,000 or more head capacity) in 12 States and small feedlots (fewer than 1,000 head capacity) in 13 States.

The report is available on USDA's website at: <http://nahms.aphis.usda.gov/feedlot>

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*(Continued on page 14)*

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## Available Resources (continued)

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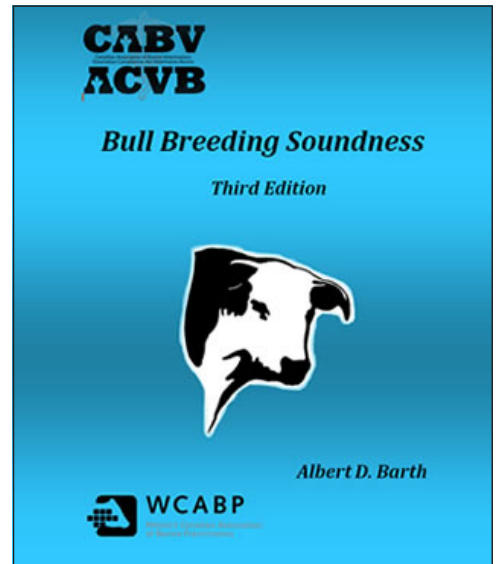
### Bull Breeding Soundness Manual

The 3rd Edition of the Bull Breeding Soundness Manual, written by Dr. Albert D. Barth, and endorsed by the Canadian Association of Bovine Veterinarians (CABV) is now available from the office of the Western Canadian Association of Bovine Practitioners (WCABP). The manual was designed as a teaching aid for undergraduate veterinary students and as a reference manual for practicing veterinarians.

To obtain a copy of the manual, order on-line at [www.wcabp.com/about-us/bull-breeding-soundness-evaluation-manual?view=form&form\\_id=1](http://www.wcabp.com/about-us/bull-breeding-soundness-evaluation-manual?view=form&form_id=1) (Canadian Orders Only)

The cost per manual is \$42.00 (including \$15.00 shipping and handling and \$2.00 GST).

If you live outside Canada or would like to order more than one book, please call the WCABP office toll free at: 1-866-269-8387 or e-mail [info@wcabp.com](mailto:info@wcabp.com).



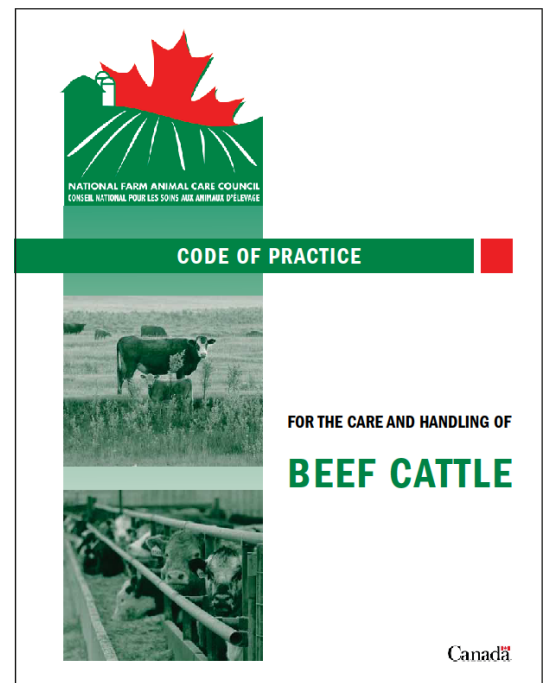
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### Code of Practice for the Care and Handling of Beef Cattle

The Canadian Cattlemen's Association and the National Farm Animal Care Council have announced the release of this new Code of Practice. This Code of Practice replaces its predecessor developed in 1991 and published by Agriculture Canada.

“Most husbandry systems impose restrictions on some freedoms of cattle. However, producers should consider the following:

- shelter for protection and comfort
- feed and water to maintain optimal health
- freedom of movement, exercise, and opportunity to express most normal behaviours
- company of herd mates
- footing that reduces the risk of slipping
- disease prevention and control
- veterinary care, diagnosis, and treatment
- freedom from unnecessary pain and discomfort
- emergency preparedness for fire, mechanical breakdowns, and the disruption of feed supplies.”



The Code is available for download at [www.nfacc.ca/codes-of-practice/beef-cattle](http://www.nfacc.ca/codes-of-practice/beef-cattle)

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## Online Training—Webinars and Courses

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### DAIReXNET Webinars—

<http://www.extension.org/pages/29156/upcoming-dairy-cattle-webinars> 


- December 16, 2013    **Critical Economic Decisions when Raising Heifers**  
Dr. Jason Karszes, Cornell University
- January 13, 2014    **Basic Vaccinology: Why Vaccines Work or Don't Work**  
12:00 p.m. Central Time, Dr. Dan Grooms, Michigan State University
- February, 2014    **Forage Fermentation: How to Make Good Silage**  
Dr. Limin Kung, University of Delaware
- 

### Hoards Dairyman and University of Illinois Webinars—

<http://www.hoards.com/webinars> 

- December 9, 2013    **Growing high yield and high quality corn silage in the northern Corn Belt**  
12:00-1:00 p.m. Central Time, Joe Lauer, University of Wisconsin-Madison
- 

### Technology Tuesdays Webinar Series—Penn State College of Agricultural Sciences

<http://extension.psu.edu/animals/dairy/health/educational-programs/technology> 

- December 10, 2013    **Bedding for Dairy Cows: The Good, the Bad & the Ugly**
- January 14, 2014    **Is Group Calf Housing for You?**
- January 28, 2014    **Robotic Milking Edition: Financing a Robotic Milking Start-up**
- February 11, 2014    **Heat Stress Abatement in Dairy Shelters**
- February 25, 2014    **Robotic Milking Edition: Feed Management in a Robotic Milking Dairy & Success Factors for a Successful Robot Start-up**
- March 11, 2014    **Dairy Housing Lighting for Convenience & Performance**
- March 25, 2014    **Robotic Milking Edition: Relationships Between Humans, Animals and Technology**
- April 8, 2014    **Getting a Handle on Lameness**
- April 29, 2014    **Robotic Milking Edition: Cow Behaviour in a Robotic Milking Dairy**
- All sessions are held 8:30—10:00 a.m. (EDT/EST)
- 

### University of Illinois Online Dairy Courses—<http://online.ansci.illinois.edu/>

Spring 2014 Courses will include:

1. **Advanced Dairy Nutrition (ANSC 423)** - Head Instructor: Dr. Michael Hutjens  
January 13 to April 15 from 5:00 to 6:00 p.m. CT on Mondays
2. **Milk Secretion, Mastitis and Quality (ANSC 435)** - Head Instructor: Dr. Richard Wallace  
January 27 to April 22 from 7:00 to 8:00 p.m. CT on Mondays

To review the class schedules, topics, and enrollment details, visit the website.

## Continuing Education/Coming Events

- December 4 & 5, 2013 Calf Congress—Growing the Next Generation, presented by Northwest New York Dairy, Livestock & Field Crops Team in conjunction with Cornell University ProDairy Program, RIT Inn & Conference Center, Henrietta, New York. [www.cvent.com/events/2013-calf-congress-registration/event-summary-ac41a7731aea48939c61dd4dd656236f.aspx](http://www.cvent.com/events/2013-calf-congress-registration/event-summary-ac41a7731aea48939c61dd4dd656236f.aspx)
- December 7 & 8, 2013 North American PRRS Symposium, InterContinental Hotel, Chicago, Illinois. For information, e-mail [reaves@vet.k-state.edu](mailto:reaves@vet.k-state.edu)
- December 7-11, 2013 American Association of Equine Practitioners 59th Annual Convention, Gaylord Opryland Resort and Convention Center, Nashville, Tennessee. [www.aaep.org/convention.htm](http://www.aaep.org/convention.htm)
- January 7-9, 2014 Dairy Farmers of Ontario Annual General Meeting, The Fairmont Royal York Hotel, Toronto, Ontario. [www.milk.org/Corporate/Content.aspx?id=1361](http://www.milk.org/Corporate/Content.aspx?id=1361)
- January 14, 15, & 16 2014 CanWest DHI Herd Management Conference  
January 14—Royal Canadian Legion, 167 Queen Street, Chesterville, Ontario  
January 15—Tavistock Memorial Hall, 3 Adam Street, Tavistock, Ontario  
January 16—PMD Arena, Main Street West, Drayton, Ontario  
Guest speaker, Dr. Don Hogle, Adjunct Assistant Professor at University of Minnesota and North Carolina State University Colleges of Veterinary Medicine will present ‘An Introduction to Dairy Stockmanship—efficient animal handling for improved safety and cattle performance,’ and ‘The Six Every Day Illusions On-farm—illusions in our senses that affect our thoughts, decisions and actions when handling cattle’. Dr. Neil Anderson and Harold House (OMAF and MRA) will speak on ‘Practical Aspects of Group Feeding of Dairy Calves’ and present an ‘Update on Calf Housing and Ventilation’. Josh Ireland of Albadon Farms, the 2012 highest DHI Herd Management Score farm will provide an overview of their farm management practices. [www.canwestdhi.com](http://www.canwestdhi.com)
- January 21-23, 2014 Banff Pork Seminar, Banff Centre, Banff, Alberta. [www.banffpork.ca](http://www.banffpork.ca)
- January 30 - February 1, 2014 Ontario Veterinary Medical Association Conference & Trade Show, Westin Harbour Castle, Toronto, Ontario. [www.ovma.org/upcoming\\_events/conference/index.html](http://www.ovma.org/upcoming_events/conference/index.html)
- February 11 & 12, 2014 Dairy Housing Design Seminars—Free Stall Housing, Ontario Ministry of Agriculture and Food and Ministry of Rural Affairs (OMAF and MRA) Resource Centre, Woodstock, Ontario. Information available soon at [www.omafr.gov.on.ca/english/livestock/dairy/confrnc.html](http://www.omafr.gov.on.ca/english/livestock/dairy/confrnc.html)
- March 1-4, 2014 45th Annual Meeting of the American Association of Swine Veterinarians, Sheraton Dallas Hotel, Dallas, Texas. [www.aasv.org/annmtg](http://www.aasv.org/annmtg)
- March 4 & 5, 2014 Dairy Housing Design Seminars—Free Stall Housing, Royal Canadian Legion, Kemptville, Ontario. Information available soon at [www.omafr.gov.on.ca/english/livestock/dairy/confrnc.html](http://www.omafr.gov.on.ca/english/livestock/dairy/confrnc.html)
- May 7-9, 2014 6th European Symposium on Porcine Health Management (ESPHM), Hotel Hilton Sorrento Palace, Sorrento, Italy. [www.esphm2014.org](http://www.esphm2014.org)
- June 8-11, 2014 23rd International Pig Veterinary Society Congress, Moon Palace Golf & Spa Resort, Cancun, Mexico. [www.ipvs2014.org](http://www.ipvs2014.org)





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Tel.: (519) 846-3409 Fax: (519) 846-8178 E-mail: [ann.godkin@ontario.ca](mailto:ann.godkin@ontario.ca)

Comments: .....

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**Deadline for next issue: February 14, 2014**



Ministry of Agriculture and Food  
Ministry of Rural Affairs

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