

livestock welfare insights

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livestockwelfare.com

Research

Research drives change and continuous improvement in how livestock are cared for. In Canada we have a strong contingent of dedicated researchers, providing a multi-disciplinary approach to livestock welfare research.

This issue of *INSIGHTS* features seven articles written by University of Guelph students, on the diverse nature of the research work in Canada and the individuals leading the way. Recognizing the research and providing extension of this work is part of the collective *Putting Animal Welfare on the Agenda* strategy to enhance livestock welfare.



These articles, a description of current research projects and contacts for 47 researchers are available on livestockwelfare.com. The site links to the *Farm Animal Welfare Issues Resource Centre* and *Research Watch*. *i*

INSIGHTS provides:
Information on livestock welfare • Reports on research, initiatives and issues • A *Putting Farm Animal Welfare on the Agenda* Project resource.

Horse Welfare

A report on horses as food producing animals has been completed by the **Alberta Equine Welfare Group**. It presents facts on the humane treatment of horses processed in Alberta and Canada for food, identifies areas that need improvement and spells out the impact of the closure of horse meat plants in the US.

The report includes historical data on horse meat consumption. Over one billion people or 16% of the world population eat horse meat.

The report highlights Canadian legislation to ensure the humane treatment of horses, at the farm, at auctions, while in transport and at all federally inspected meat plants. It details the USDA regulation that states US horses transported to Canadian meat plants must go on single deck trailers and be inspected by USDA and CFIA veterinarians.

Unlike many US states, livestock are not exempt from Canada's animal protection laws. Studies done by AFAC, the Alberta SPCA and by Dr. T. Grandin point to original owner induced neglect as the core equine welfare concern.

Before the US horse plants closed in 2007, 50,000 horses were processed in Canada for human consumption. By the end of 2007, this number had doubled. A new plant has opened in Saskatchewan with a capacity equal to the Alberta plant. The number of horses imported into Canada has increased by 40%.

People tend to view their horses as livestock, as working animals or as companion animals. These different viewpoints are acknowledged in this report. What is important is that all horses be treated humanely throughout their lifetime.

The actions in the US and the resulting consequences of growing horse neglect, abandonment and starvation are noted.

For a copy go to www.afac.ab.ca. *i*



Single deck horse trailer

Published by:



Farm Animal Council of Saskatchewan Inc.



U OF S RESEARCHER WORKS TO MAKE ROUTINE PROCEDURES BOTH ANIMAL AND HANDLER FRIENDLY

Cutting back on routine pain

By Mihiri De Silva

Without a proper understanding of how common procedures affect livestock, farm animals can sometimes be subjected to routine, unnecessary pain. But a University of Saskatchewan (U of S) researcher is developing new ways to gauge animal comfort, and coming up with new practices that are good for animals and producers alike.

Prof. Joseph Stookey, an animal behaviourist at the U of S, is interested in quantifying cattle and swine pain during and after routine on-farm management practices. He believes that if feasible, less painful alternatives are established, producers can make informed decisions when castrating, dehorning, weaning and branding their animals.

“I’m trying to get a better understanding of pain in animals so ultimately the process of controlling pain is easy and practical for producers,” says Stookey.

Stookey uses video surveillance, restraint-strain gauges and animal vocal responses to detect levels of pain intensity. This approach shows castration and dehorning inflict significantly more pain when animals are older than when they are younger. From an animal welfare perspective it means bull calves should be castrated before weaning and before they reach the feedlot.

Long-term pain during recovery from routine procedures is also poorly understood and often subjectively scored, or the assessment has traditionally been made by looking for changes in post-operative eating and sleeping habits, says Stookey. By adding more sensitive measures to assess chronic pain, such as changes in stride length of the animal, Stookey says he can better assess recovery time.

But, whether considering chronic or acute pain, Stookey emphasizes the importance of open communication with producers — handlers know their animals best, and can pick up subtle behavioral cues. These cues can be adapted as pain indicators, which can be very important to pain management efforts.

Although quantifying pain may identify alternative methods, it won’t always convince producers to adopt the most animal-



Dr. Joe Stookey

friendly options because the least painful procedures are often the least feasible for producers.

“Administering anesthetic to individual piglets before tail and teeth clipping is unreasonable for handlers because of the extra handling and extra time,” says Stookey, citing an example.

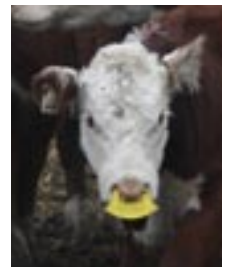
Stookey’s second research focus addresses this welfare hurdle. Once pain is quantified, Stookey works to develop pain-control options that appeal to producers. For example, he is currently investigating if pain medication can be safely passed through the sow’s milk to her piglets, minimizing discomfort and handling stress during tail and teeth clipping.

In 2002, Stookey and former graduate student Dr. Derek Haley introduced the Canadian beef industry to an animal-friendly and practical two-stage weaning method (QuietWean). They used a small, non-invasive plastic flap that, when attached to a calf’s nostrils, prevents access to a cow’s udder. The gradual separation of calf and cow by first denying milk, results in less stress and health complications for both cow and calf. The anti-suckling tool is a good example of how practical, animal-friendly options are quickly incorporated into practice once they are identified.

Although making routine farm practices entirely painless and stress free is unlikely, Stookey says minimizing suffering isn’t asking too much. He continues to uncover ways to quantify pain among animals and develop easy-to-use, affordable strategies for pain relief.

“Minimizing livestock pain from routine practices isn’t just a choice,” says Stookey, “it’s our responsibility.”

Funding for Stookey’s research has come from the Natural Sciences and Engineering Research Council and the Saskatchewan Agricultural Development Fund. [i](#)



Calf with weaning tool & Dr. Haley

UBC RESEARCHERS FIND EXPENSIVE BARNs ARE NOT WHAT MAKE DAIRY COWS CONTENT AND HEALTHY

Determining best environment for cow comfort

By Sarah Van Engelen

Refurbishing barns can represent a large financial commitment for dairy farmers. But researchers at the University of British Columbia (UBC) are learning that what farmers provide for their cows is often not what cows really want and need to be healthy and content.

Prof Dan Weary, Faculty of Agricultural Sciences, UBC is working to determine which environments best address a cow's health and comfort.

"When I started working as a dairy researcher, farmers kept asking me to look at cow comfort," says Weary. "What I found were many recommendations, but no almost no research to back them up – farmers were being asked to make million-dollar decisions based on little more than a well-educated guess."

Weary has spent much of the past decade doing research to provide science-based recommendations to dairy farmers about barn design. The research has been very successful: dairy farmers now have access to well founded, practical recommendations for better stalls, flooring and feeding systems that improve cow comfort and cow health.

"We've come along way on the topic of cow comfort," says Weary. "But we can't sit back and congratulate ourselves when much work remains to be done."

In particular, lameness is a large problem for the dairy industry, and the UBC group is working to create housing systems that reduce the risk of cows becoming lame. In one recent study, Weary and colleagues kept lame cows either in a well-designed freestall barn or outside on pasture. Within two weeks, the pastured cows had improved, but their freestall barn counterparts were still lame.

"We had to ask what was wrong with our expensive barn," says Weary. "We built it to be comfortable, but pasture was doing something better that allowed lame cows to recuperate."

Weary first guessed the tendency of pastured cows to lie down more frequently was the key to their speedy recovery – but he found they actually spent less time lying down in the pasture, than those kept in the barn. He now believes



Drs. Weary, Fraser & von Keyserlingk with UBC animal welfare grad students

the recovery time is related to where cows stand. Cows kept indoors must stand on concrete that is often covered in manure, and this standing surface can lead to infections and injuries that cause lameness.

In a second study, the UBC researchers modified freestall design to give cows a dry, comfortable place to stand within the stall. "We found that these stalls designed to provide a comfortable standing place really worked – they reduced the time that cows were exposed to wet concrete and allowed lame cows to recover."

Research on cow comfort at the UBC continues. "We want to develop a real working model for cow comfort," says Weary. "We want to take research and make barns that are better for the cows and that are practical for the farmers."



Weary first became interested in animal welfare after meeting Canadian animal welfare pioneer David Fraser. Weary and Fraser worked together on pig welfare and behaviour at the Central Experimental Farm in Ottawa for several years before they were recruited by the UBC for its animal welfare program. Weary now works

closely with Fraser and colleagues Marina von Keyserlingk, Jeff Rushen, Anne Marie de Passil  and Doug Veira.

This research is funded by the Dairy Farmers of Canada and the Natural Sciences and Engineering Research Council. i

GUELPH RESEARCHER EVALUATES ANIMAL BEHAVIOUR AND PREFERENCES TO GAUGE WELFARE

Figuring out what animals want

By Mihiri De Silva

Product yield is a common on-farm measure of animal health and happiness. But, for one researcher, that measure just doesn't make the grade.

With over 40 years dedicated to animal welfare research, Prof. Ian Duncan of the Department of Animal Nutrition Science at the University of Guelph, is an expert in the field. His current work rejects using product yield to measure animal health. Instead, he evaluates well-being by asking animals what they want, and observing behavioural cues for their answer.

"I develop methods to ask animals how they feel," says Duncan. "By looking at how hard they are willing to work to obtain or avoid certain stimuli, we get an idea of their preferences."

Duncan uses preference tests in the poultry, cattle, swine and aquaculture industries to ask animals questions. These assessments involve presenting animals with options to observe their choice and response. This way, farmed animals can speak for themselves, instead of depending on yield or stress indicators to convey feelings.

For example, Duncan's approach has uncovered rearing options sure to improve housing conditions in the poultry industry which is his area of specialty. Caged hens provided with a nesting site opted to carry out nest-building behaviour one hour before laying eggs. In comparison, hens without a nesting site showed elevated signs of restlessness and distress during the same period. Duncan also found the hens exerted



Prof. Ian Duncan with research assistant



Furnished cages

the same amount of force to get to a secluded nesting place as they did to gain access to food when they were extremely hungry, emphasizing the importance of this comfort behaviour.

His findings prompted the poultry industry to take action. In parts of Europe, cages now come equipped with nests. Although providing furnished cages has no proven benefit on egg quality or quantity,

it obviously makes for more content, and consequently healthier, hens.

In addition to tackling welfare issues in well-established livestock industries, Duncan is evaluating preferences in the aquaculture sector. He hopes to separate reflexive from stress-related responses to negative stimuli, to illustrate the ability of fish to experience fear, stress and frustration. Once confirmed, doubts about a fish's capacity to feel can be put to rest, and their welfare appropriately protected on fish farms, says Duncan. He has shown that if rainbow trout are given a warning that they are going to be frightened, they calmly swim to a safe place and avoid being frightened

Once methodologies for preference tests and behaviour evaluation are fine tuned, Duncan hopes to investigate pleasure among farm animals, taking animal welfare to a whole new level.

Duncan has published more than 150 scientific papers relating to animal behaviour and well being. He currently holds the oldest North American university chair in animal

welfare. Duncan is hailed as one of the first researchers to bring scientific perspective to animal welfare studies.

Duncan's research is funded by Natural Sciences and Engineering Research Council. i



RESEARCHERS ARE DEVELOPING INNOVATIVE WAYS TO TEST FOR CALF ILLNESS

Customizing calf care

By Sarah Van Engelen

Calf handling procedures such as weaning and dehorning – combined with transportation to feedlots – all cause high levels of stress. They leave calves more susceptible to illness, especially respiratory diseases. Consequently, producers will use antibiotics and other medications to prevent illness.

However, it's traditionally been difficult to identify which animals are truly in need of medical treatment. Often, fewer than half of the calves are actually sick and need to be treated, but a producer does not want to miss treating an animal that's in need of treatment.

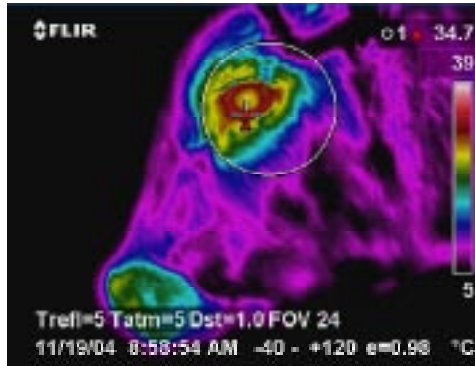
Dr. Al Schaefer, a stress physiologist at Agriculture and Agri-Food Canada's Lacombe Research Centre in Alberta, has been studying ways to better identify ill calves and provide an opportunity to more closely identify and target treatments to animals in need. For early detection, Schaefer has developed a camera-monitoring device that measures the temperature of an animal, using infra-red technology.

"It's apparent that transport and handling procedures greatly affect animals," says Schaefer. "These factors go on to influence food safety and the quality of meat that the animals produce."

Producers can feel compelled to provide antibiotics to calves because disease detection is difficult and often too late to allow for effective treatment.

Once a calf is infected by a virus or bacterium, it will start to show thermal changes within the first few days. However, many of the clinical changes and symptoms usually noticed by producers will often not display themselves until several days later, says Schaefer. He believes this progression is similar to humans getting a cold - they can have a hot forehead before they have the sniffles.

But waiting for a calf to get the sniffles often means it's more difficult, or even too late, to treat disease. Using calf-radiated temperature to monitor health would give farmers enough time to identify sick animals and treat them accordingly.



Infra-red read out



Dr. Al Schaefer



By installing this camera device at water stations in feedlots, which calves typically visit several times a day, the machine can take a picture, store the infra-red information, and determine if the calf is within a healthy temperature profile. By monitoring the calf throughout the day, researchers can quickly determine if there is a problem, and the calf can either be treated or further monitored.

This study, which began nearly 10 years ago, is now being tested in functional feedlots to determine its effectiveness. If implemented, the economic benefits for producers would be significant – savings of about \$30 per animal in medication costs, and another \$200 in animals who would otherwise be severely affected by bovine respiratory disease (which leads to reduced performance and slower growth rates). This means lower costs and increased efficiency for farmers.

"So far, we've collected data on hundreds of animals," says Schaefer. "If it proves itself, which it should, then the next step would be to hand off the technology to the industry."

Also involved in this research are Drs. Nigel Cook and John Basarab, Alberta Agriculture and Rural Development, Lacombe Research Centre; Shannon Scott,

Agriculture and Agri-Food Canada's Brandon Research Centre; Erasmus Okine and Clover Bench, Department of Agricultural, Life and Environmental Sciences, University of Alberta.

This research is sponsored by Agriculture & Agri-Food Canada, the Beef Cattle Research Council and the Natural Sciences and Engineering Research Council. i

CANADIAN RESEARCHERS FOCUS ON IMPROVING ANIMAL TRANSPORT PRACTICES

Road hogs

By Sarah Van Engelen

Transport can be a stressful experience for pigs. Numerous studies have been conducted with the hope of curbing transport stress, but most have been carried out in Europe and don't address many of Canada's unique transport challenges. Now, researchers are looking at the complexities of pig transport in Canada, to help provide country-specific recommendations.

Prof. Renée Bergeron, Department of Animal Behaviour and Welfare at the Campus d'Alfred, University of Guelph, is part of a research team lead by Prof. Harold Gonyou, University of Saskatchewan, studying the effects of transport on pigs in Canada by monitoring them before, during and after travel and paying specific attention to things like distance and climate.

"There have been a lot of research studies conducted on pig transportation, but not many in Canada," says Bergeron. "Here, we have extreme weather and long distances that we need to consider when examining animal transport stress."

In Canada, the sheer size of the country means pigs are often trucked long distances between farms or to processing plants. Canada's cold winters and sweltering summers can also be stressful on pigs during transport.

One of the research team's primary concerns is the effect of truck design on the stress level of pigs during transport and on their behaviour during unloading.

With cameras mounted in a truck, researchers are monitoring how long the pigs spend standing versus lying down during transport. Observers also record pig behaviour during unloading.

By coordinating the pigs' behaviour with outside factors, including temperature, duration of the trip and behaviour during all facets of transport, Bergeron and her team hope



Drs. Bergeron, Widowski & Dewey are studying the effects of transport on pigs

to develop a better understanding of how these all affect the animals. In addition to observation, Bergeron is also taking blood samples during the transport process to test for hormones, such as cortisol, that are indicative of rising stress levels. Heart rate and body temperature during transport, as well as meat quality, are also monitored.

"We want to achieve a good picture of the Canadian situation and which part of transport is the most stressful," says Bergeron.

Once the data is collected and analyzed, findings will be disseminated widely so all stakeholders – farmers, processing plants and regulation committees – can benefit. This study is supported by the pork industry, so Bergeron hopes improvements, such as transport changes and policy development, will be implemented quickly and easily.

"Hopefully we can apply this research and be able to help the industry," says Bergeron. "Our results can help inform regulators, such as the Canadian Food Inspection Agency and help in creating better Canadian standards."

Also involved in this research are Prof. Harold Gonyou (project leader), University of Saskatchewan; Dr. Luigi Faucinato, Agriculture and Agri-Food Canada; Prof. Nora Lewis, University of Manitoba; Prof. Cate Dewey, University of Guelph; Prof. Tina Widowski, University of Guelph; Dr. Stephanie Torrey, Agriculture and Agri-Food Canada; and Prof. Jean-Paul Laforest, University of Laval.

This research is funded by the Natural Sciences and Engineering Research Council, Agriculture and Agri-Food Canada, Whole Foods Market, Maple Leaf Fresh Foods, Alberta Pork, Fédération des producteurs de porcs du Québec (Quebec Pork), Manitoba Pork, Ontario Pork and SaskPork. i

ALBERTA RESEARCHER TARGETS IMPROVED CHICKENS' REPRODUCTIVE FITNESS

Healthy hens, more chicks

By Lisa Lawlor

Healthy hens are productive hens. A University of Alberta (U of A) researcher is studying reproductive fitness in broiler breeder hens, providing further proof that what's good for hens can be good for farmers as well.

Prof. Frank Robinson, Faculty of Agricultural, Life and Environmental Sciences at the U of A is examining the impact of two common practices – lighting programs and feed allocation – on reproductive fitness. He's finding that small changes can, in the long run, produce healthier hens capable of producing greater numbers of chicks, a winning situation for both the producer and farm animal.

One focus of his research program looks at the impact of common barn lighting practices on hen health and reproduction. Most farmers change the number of light hours in the barn from eight to 16 per day when pullets reach 20 or 21 weeks of age. Increasing the number of light hours in the barn signals pullets to initiate puberty and produce offspring. But, Robinson is finding that pushing the biological clock ahead too early is not the most productive and cost-effective practice.

“We're finding that it's more beneficial to us and to the hen if we delay puberty

to a time later than some people would have considered the optimal time,” says Robinson.

This means waiting until the pullets are 23 weeks of age before increasing the day length to initiate puberty. In trials, Robinson has found that by giving the pullet three weeks longer to mature naturally, their settable egg production – the eggs that can be put into the incubator and expected to hatch – is increased. He suspects the delay in inducing puberty allows the hens to develop a more robust reproductive tract.

In a second area of his research, Robinson is looking at the impact of weight on hen health and reproductive success. Standard feeding practices can occasionally lead to hens that are overweight. Overweight hens have erratic laying patterns which can result in eggs with poor shells and eggs being laid on the floor rather than in nests. Egg with shell problems and floor eggs are not accepted by the hatchery as they will likely not hatch or may be dirty and present a contamination risk. Excess body weight can also lead to hens laying multiple eggs (or eggs with multiple yolks) one day, and then none for several days. When hens are at a healthy weight, they will reliably produce one

egg per day and will not experience the physiological stress associated with being either under or overweight.

To produce healthier hens, Robinson has been conducting feed studies where, from the age of three weeks, hens are provided with a rationed diet and are continually supervised to ensure their weight doesn't increase or decrease substantially. The hens are weighed weekly, and the amount of standard chicken layer diet of corn, wheat and soybean is adjusted accordingly.

“We're looking for uniformity; you can't have hens of different sizes because they will affect each other's eating allowances,” says Robinson.

This study is being conducted at the broiler breeder barn of the U of A research facility.

Collaborating researchers include Dr. Rob Renema from the U of A, Dr. Martin Zuidhof and Dr. Val Carney of Alberta Agriculture and Rural Development.

This research is funded by the Agriculture Funding Consortium, Natural Sciences and Engineering Research Council, Aviagen, Poultry Industry Council, Ontario Broiler, Hatching Egg and Chick Commission and the Poultry Research Centre. i



PRACTICAL EXPERIENCE TO GIVE VETERINARIANS BETTER ANIMAL WELFARE KNOWLEDGE.

Teaching novel approaches to animal welfare

By Lisa Lawlor

With a focus on experiential learning, the University of Calgary is set to produce a new generation of veterinarians well attuned to animal welfare issues.

Prof. Eugene Janzen, associate dean of clinical programs at the University of Calgary, says a unique characteristic of the University of Calgary's Faculty of Veterinary Medicine (UCVM) will be the placement of fourth-year students in the Distributed Veterinary Learning Community – a network of practicing veterinarians throughout the province.



Dr. Eugene Janzen

Janzen is hopeful this experiential learning environment will give students a heightened sensitivity to animal welfare and teach a new generation of veterinarians the importance of their position in the sector.

“The role of the veterinarians in animal agriculture has already begun to change,” says Janzen. “Veterinarians are now creating,

delivering and monitoring protocols for sound welfare management in intensive agriculture operations. The humane management of animal production in intensive agricultural systems has become one of the deliverables of a veterinarian's food-animal practice.”

To ensure new veterinarians can provide these deliverables, the UCVM will give them the tools to assess animal health and well being. To this end, the UCVM will incorporate animal welfare into all courses, ensuring a holistic approach

to animal health that will complement students' out-of-classroom learning.

“The UCVM has created several courses in the curriculum that specifically address animal handling, animal well being and behavioral observation as an assessment tool,” says Janzen.

For example, an animal behaviour course will be offered to every student in the first semester of study, introducing students to behaviour as the first indicator of animal welfare. A second semester course focused on the introduction to animal industries will give students perspective on some of the welfare issues that emerge, including safe transportation practices.

The UCVM has already recruited 35 professors. Among the faculty are researchers who specialize in clinical studies, both individual and population medicine, with interest in pain control and anesthesia.

This September, the veterinary school's first class of DVM students will enter the program, taking its place among Canada's other veterinary schools in Quebec, Prince Edward Island, Saskatchewan and Ontario.

The UCVM school is funded by the government of Alberta. ⁱ



UCVM graduate students conducting research in the field



New Clinical Skills Building (under construction)

Putting Farm Animal Welfare on the Agenda.

Public concern and interest in farm animal welfare continue to grow. There is some excellent work being done to improve farm animal care. Our challenge is to communicate that information to where it's needed, from farmers to consumers and everyone in between.

This publication is part of the new *Putting Farm Animal Welfare on the Agenda* project — a team effort to increase communications about farm animal welfare across the country. Funding for this project was provided in part through Agriculture and Agri-Food Canada's Advancing Canadian Agriculture and Agri-Food Program. This is a collective outcome partnership with the Agricultural Adaptation Council in Ontario, the Manitoba Rural Adaptation Council, the Saskatchewan Council for Community Development and the Alberta Agriculture and Food.