9TH BOEHRINGER INGELHEIM EXPERT FORUM ON

FARM ANIMAL WELL-BEING

JUNE 3RD AND 4TH 2016, MONTREAL (CANADA)

Boehringer Ingelheim

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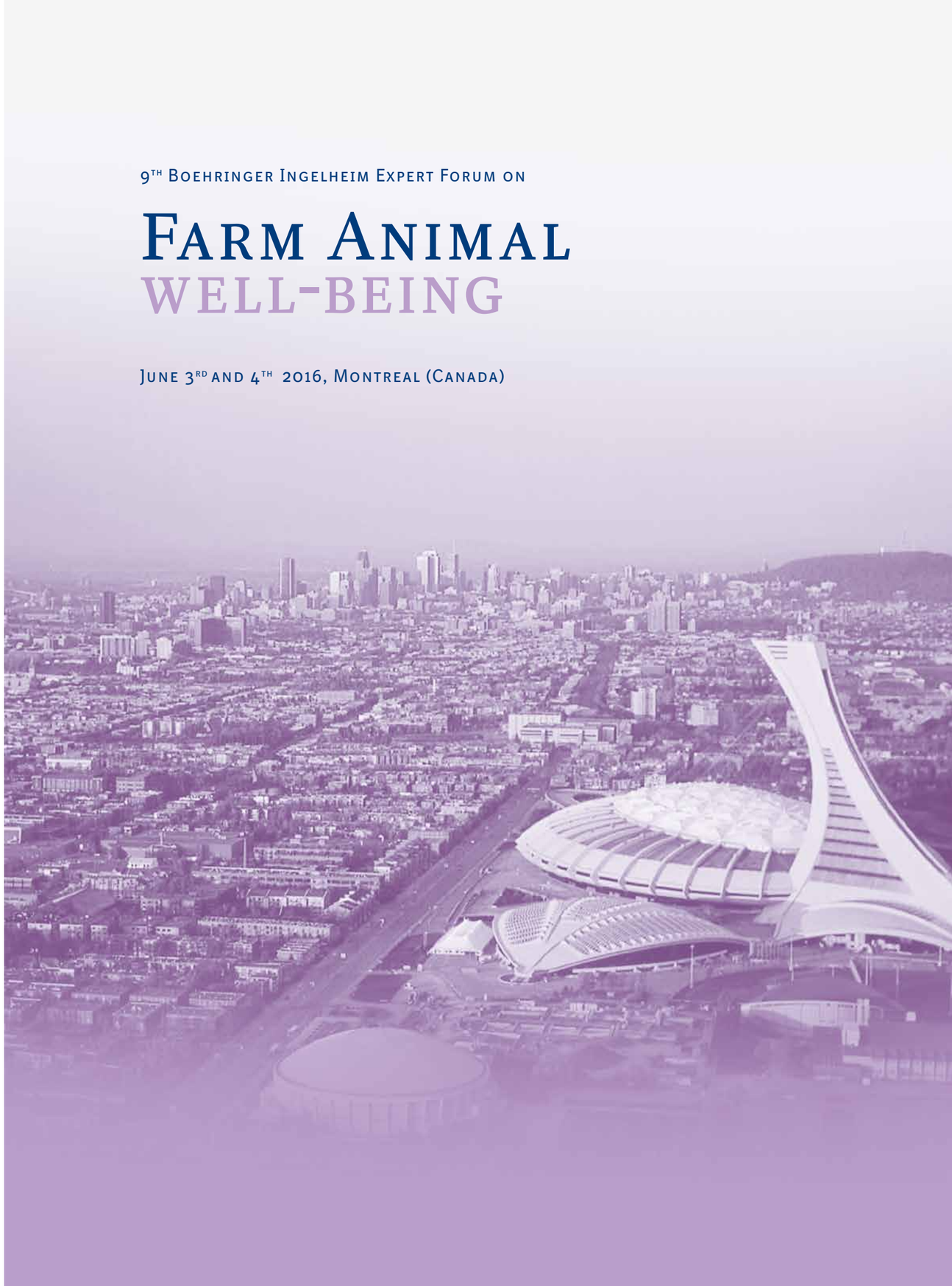

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FARM ANIMAL WELL-BEING

CONTENT

Strategies for better welfare that improve animal health and farm economics

Prof. Wim Verbeke

Wim Verbeke is professor of agro-food marketing and consumer behaviour and chairman of the department of agricultural economics at Ghent University in Belgium. Wim graduated from Ghent University with a Master of Science degree (in 1993) in Bio-science Engineering: Agricultural Sciences. He completed a Master of Business Administration in Marketing Management from the Vlerick Leuven Gent Management School in 1994 and obtained his PhD in Applied Biological Sciences in 1999 from Ghent University.

Wim is involved in academic teaching and research in the field of economics, food policy, food marketing and consumer behavior. His research focuses on food consumer science, stakeholder and consumer decision-making, perception and acceptance of production technologies and food products or product concepts. Specific research interests are on the impact of information about food quality and food safety, and the impact of individual difference variables on perceptions, attitudes and behavior towards food and food production and processing methods.

Wim has (co-) authored more than 250 peer-reviewed papers in leading international journals in the disciplines of agricultural economics and policy, agriculture, marketing, communication, food science and technology, and nutrition and dietetics. He has been selected as a Thomson Reuters Highly Cited Researcher in Agricultural Sciences in 2015.

Farm animal welfare through the eyes of key stakeholders versus consumers

Prof. Wim Verbeke
Ghent University, Belgium

Animal welfare, its assessment, monitoring and improvement are joint responsibilities and challenges for stakeholders involved in the agro-food chain. This contribution presents an overview of diverse stakeholder groups' views on farm animal welfare as far as these have been studied and documented. Examples from empirical research are provided to support why producers and, by extension, the entire agro-food sector should open their eyes for the way consumers and citizens see animal welfare.

Different stakeholders, different views?

Stakeholders such as government officials, scientists, veterinarians, farmers, and animal welfare representatives hold fairly similar views with regard to the importance of animal welfare and they are fairly consistent in their ranking of welfare indicators (Verbeke, 2009). Yet, differences among stakeholder groups and a potential divide between stakeholder and societal views are often seen for diverse reasons. In a study by Ventura et al. (2015), different stakeholders gave reasons for why they considered cattle welfare issues, such as lameness, cow comfort, or disease, problematic. These reasons were grouped according to animal-centered versus industry-centered concerns. Areas of shared concern across stakeholders related for example to tail docking and the implementation of pain control protocols for procedures such as dehorning, whereas less consensus was found related to issues such as pasture access or the provision of natural living conditions. Also within specific stakeholder groups, different views have been identified based on attitudes towards and interests in animal welfare, e.g. within groups of farmers (Bock & van Huik, 2007) or veterinarians (Heise et al., 2016). The reason is that individual interests in animal welfare and related opinions are guided by a complex set of personal motives, values, norms and attitudes, combined with environmental and situational determinants such as the individual's or institution's socio-cultural, task- and macro-environments, including social, economic, technological, regulatory and political forces.

Personal and environmental determinants

To exemplify the role of personal determinants, Norring et al. (2014) reported that mean scores for cattle pain given by production-animal practice-oriented veterinarians were associated with personal empathy towards animals and humans, family size and attachment to family pets. Socio-economic and cultural contexts matter too. Stafford (2014) indicated that veterinarians in different countries differ in their attitudes and behaviors in relation to animal welfare issues as they have to work with farmers who face different economic and social pressures imposing specific practical constraints. Further, following a study on veterinarians' attitudes towards and understanding of animal welfare, Heise et al. (2015) concluded that veterinarians in Germany have a sophisticated understanding of animal welfare that adequately represents the current state of research in the domain. By contrast, Wu et al. (2015) flagged a relative lack of awareness of animal welfare as well as further understanding of its importance and influence among Taiwanese vets, based on which the authors recommended a stronger focus on training and professional education related to animal welfare.

Societal versus stakeholder views on animal welfare

Societal conceptualizations of farm animal welfare are typically shaped by low levels of practical experience and higher levels of empathy with animals (Vanhonacker et al., 2010), and hence potentially conflict with views held by other stakeholders.

Vanhonacker et al. (2008) investigated farmers' interpretations of the concept of farm animal welfare relative to those held by citizens. A total of 72 aspects relating to animal welfare were ranked very similar in terms of perceived importance by both citizens and farmers. Yet, citizens attributed higher importance scores to most aspects as compared to farmers, and they evaluated the current state of farm animal welfare more negative than farmers in particular for animal welfare aspects relating to natural behavior, pain, stress and availability of space, which makes these aspects highly susceptible to societal debate and divide. In addition, Vanhonacker et al. (2016) reported that although citizens and producers attributed equal levels of importance to animal welfare, citizens believed that farm animals suffer (broiler chickens in this study); they felt not well-informed about animal welfare issues; and claimed to be willing to pay more for higher welfare products, while producers reported totally opposed views on each of these topics.

Taking the Welfare Quality® operational definition of farm animal welfare with 12 criteria and four principles as the point of departure, Tuyttens et al. (2010) investigated the (mis)-match between farmers' versus citizens' conceptualizations of animal welfare. Farmers gave lower importance scores overall to the 12 welfare criteria compared to citizens. The largest gap was seen for items relating to the 'expression of social or other behaviors', while scores were more consistent for the perceived importance of 'absence of disease'. Farmers attached a higher weight to the principle 'good feeding' as compared to citizens, but both groups attributed the highest and equal weight to the principle 'good health'.

Why bothering about citizen and consumer views?

Frames of reference with respect to animal welfare have been classified broadly into an economic versus moral paradigm (Bracke et al., 2005). Commercial actors from the supply side of agro-food chains pursue economic goals in addition to safeguarding their 'societal license' or 'permit' to produce, to which responsiveness to animal welfare concerns can contribute. At least, under the premise that the resulting end products and the organization's corporate image – associated with higher animal welfare – can be effectively marketed and communicated, and hence generate extra margin and societal support. Differentiation is typically done through private branding or collective and voluntary labelling programs, in which animal welfare is part of a wider notion of product quality. However, within such a composite construction of product quality, animal welfare is rarely an explicit component (Miele & Bock, 2007).
On the demand side of agro-food chains, consumers strive for obtaining satisfaction through aligning product experience with expectations. Despite associating better animal welfare with better quality, healthiness, environmental friendliness and safety, as a consumer and on average, people do not rate animal welfare as a product attribute among their top interests for making food purchase decisions (Vanhonacker et al., 2010). The duality between an individual's interests as a citizen versus as a consumer has been referred to as the attitude-to-behavior gap. For example, Verbeke et al. (2010) showed that the relationship is weak between individuals' views as citizens as to how pigs should be produced and their behaviors as pork consumers. Yet, numerous studies showed that consumers might be willing to pay average price premiums ranging roughly from 5 – 40 % for products

that meet higher welfare standards (Van Loo et al., 2014). As consumers are not all alike but constitute a heterogeneous market consisting of segments with differentiated preferences, opportunities emerge for higher welfare products in profitable niche markets.

Conclusions

Overall, this contribution illustrates that although the concept of animal welfare is generally rated as important, its meaning may differ among different stakeholders. Therefore, it may not be realistic to expect that one single operational definition of farm animal welfare reflects the understanding of this complex concept by every single person. Animal welfare standards are becoming a part of a wider notion of quality and sustainability in many livestock product quality assurance schemes, but the market share of livestock products with a distinct animal friendly image or explicit animal friendly positioning remains small. Nevertheless, tackling animal welfare issues helps building societal legitimacy and entails profit potential in particular niche markets.

References

Bock, B.B.; van Huik, M.M. (2007):
Animal welfare: The attitudes and behaviour of European pig farmers. British Food Journal 109, 931 – 944.

Bracke, M.B.M.; De Greef, K.; Hopster, H. (2005):
Qualitative stakeholder analysis for the development of sustainable monitoring systems for farm animal welfare. Journal of Agricultural & Environmental Ethics 18, 27 – 56.

Heise, H.; Kemper, N.; Theuvsen, L. (2015):
What do veterinarians mean by animal welfare? Evidence from an empirical study. Tierärtzliche Umschau 70, 299 – 304.

Heise, H.; Kemper, N.; Theuvsen, L. (2016):
Die Einstellung deutscher Tierärzte zu Tierwohl in der Nutztierhaltung: Ergebnisse einer Clusteranalyse. Berliner und Münchener Tierärtzliche Wochenschrift 129 (3/4), 10 – 18.

Miele, M.; Bock, B. (2007):
Competing discourses of farm animal welfare and agro-food restructuring. International Journal of Sociology of Food and Agriculture 15, 1 – 7.

Norring, M.; Wikman, I.; Hokkanen, A.H.; Kujala, M.V.; Hanninen, L. (2014):
Empathic veterinarians score cattle pain higher. Veterinary Journal 200, 186 – 190.

Stafford, K. (2014):
Sheep veterinarians and the welfare of sheep: No simple matter. Small Ruminant Research 118, 106 – 109.

Tuyttens, F.A.M.; Vanhonacker, F.; Van Poucke, E.; Verbeke, W. (2010):
Quantitative verification of the correspondence between the Welfare Quality® operational definition of farm animal welfare and the opinion of Flemish farmers, citizens and vegetarians. Livestock Science 131, 108 – 114.

Van Loo, E.J.; Caputo, V.; Nayga, R.; Verbeke, W. (2014):
Consumers' valuation of sustainability labels on meat. Food Policy 49, 137 – 150.

Vanhonacker, F.; Tuyttens, F.; Verbeke, W. (2016):
Belgian citizens' and broiler producers' perceptions of broiler chicken welfare in Belgium versus Brazil. Poultry Science, DOI: dx.doi.org/10.3382/ps/pew059.

Vanhonacker, F.; Van Poucke, E.; Tuyttens, F.; Verbeke, W. (2010):
Citizens' views on farm animal welfare and related information provision: Exploratory insights from Flanders, Belgium. Journal of Agricultural & Environmental Ethics 23, 551 – 569.

Vanhonacker, F.; Verbeke, W.; Van Poucke, E.; Tuyttens, F. (2008):
Do citizens and farmers interpret the concept of farm animal welfare differently? Livestock Science 116: 126 – 136.

Ventura, B.A; von Keyserlingk, M.A.G.; Weary, D.M. (2015):
Animal welfare concerns and values of stakeholders within the dairy industry. Journal of Agricultural & Environmental Ethics 28, 109 – 126.

Verbeke, W. (2009):
Stakeholder, citizen and consumer interests in farm animal welfare. Animal Welfare 18, 325 – 333.

Verbeke, W.; Pérez-Cueto, F.J.A.; de Barcellos, M.D.; Krystallis, A.; Grunert, K.G. (2010):
European citizen and consumer attitudes and preferences regarding beef and pork. Meat Science 84, 284 – 292.

Wu, S.Y.; Lai, Y.T.; Fei, C.Y.; Jong, D.S. (2015):
Attitudes of Taiwan veterinarians towards animal welfare. Animal Welfare 24, 223 – 228.

Notes

Dr. Dave Dykshorn

Dr. Dave Dykshorn comes from rural NW Iowa, where he grew up working on his family's dairy farm. He studied animal science at Dordt College while working with a swine research center in Sioux Center. He went on to graduate from Iowa State University College of Vet Med in 2011, and since then has been working at the Abbotsford Veterinary Clinic in the Fraser Valley of British Columbia with focus on production animal medicine, primarily dairy medicine, and developing on-farm animal welfare initiatives. He is a newly appointed board director for the Western Canadian Association of Bovine Practitioners and looks forward to continually getting more involved in the dairy industry and the ever-changing production animal veterinary profession.

The many eyes on farm animal welfare: the veterinarian's response, responsibility and leadership

Dr. Dave Dykshorn,
Abbotsford Vet Clinic, Canada

We are a nation of consumers who enjoy the world's top quality food; food that is readily available and provided to us at reasonable prices. Today's consumer is also the most removed from real agriculture with less than 2% of Canada's population directly involved with food animal production. Today's consumers desire to know how their food is produced, including how the animals are raised in agriculture. The desire is good!

Every consumer's personal bubble includes social media which blasts information; information based on emotion, feelings or facts about the food we consume and the producers of that food, be it accurate or not.

As food animal veterinarians, we find ourselves positioned between farm owners, employees and consumers, striving to improve and defend the industry we live and breathe. We work with, and invest in, the producer groups and the farmers themselves to influence how our food is produced. We continue to be a trusted source of information, leaders in animal health and well-being, and a significant influence on changes in animal care and well-being.

As a veterinary team, we take this role to heart while further developing our farmer and farm employee relationships. We are using the tools available to us and the tools we develop to provide education, skill sets and best management practices. Achieving this, and working towards our mission statement: "Delivering excellence in animal care; supporting safe and sustainable food production," gives us our goal of establishing leadership while actively engaging each producer to promote outstanding animal welfare and well-being.

We ask ourselves these questions: How are we doing as food production veterinarians? What is our responsibility as a veterinary team? How are we educating the producer? How are we educating the consumer? How are we helping our producers achieve excellence in animal care and produce safe, sustainable food products?

To understand some of the external motivation for working through these questions, we, as a clinic, need to take into account some background information of the dairy industry in British Columbia. As of October 1, 2015 adherence to the Code of Practice for the Care and Handling of Dairy Cattle 2009 became mandatory for all dairy farmers in British Columbia following an event of external consumer and industry pressure on the dairy industry to take a better look at farm animal care and well-being.

This code of practice, with facilitated development from the National Farm Animal Care Council (NFACC), was developed with Dairy Farmers of Canada (DFC) as guidelines intended to promote sound management and welfare practices through recommendations and requirements for housing, management, transportation, processing, and other animal husbandry practices. Since then, the BC Milk Marketing Board has been monitoring compliance to the Code of Practice through random on-farm welfare assessments and will continue to do so until the proAction Animal Care Program implementation is complete. The proAction initiative institutes an animal care program developed by NFACC and DFC from a framework process which translated the requirements of the Dairy Code of Practice into an auditable on-farm animal care program. This program was merged with the Canadian Quality Milk program in BC and initiated in 2016. It is mandatory for all dairy producers in BC.

Furthermore, the Provincial Government, working with the BC Dairy Association and the BC SPCA, announced it will adopt the Dairy Code of Practice within the Prevention of Cruelty to Animals Act (PCA Act). This legislation and policy update may change the way that guidelines, within the Code of Practice, are adhered to and enforced, but the goal will remain the same; our veterinary team will continue taking an active approach in helping our farmers achieve excellence in animal care and produce safe, sustainable products. We will continue to work towards expanding our role as leaders within the industry; to be educators, and to continue to develop tools for our farmers to become leaders and educators themselves.

Some of our highlighted and developed commitments involve:

Client education: Both on-farm, through bi-weekly/monthly visits and development of farm animal care commitments as part of our herd health services, and through producer group seminars.

AVC Best Management Practices (BMPs):
Our veterinary support team has developed resources that outline and educate our clients in best management practices for a wide range of farm practices; from calf health and painful procedure management, to fresh cow protocols and biosecurity strategies.

Producer and Employee Training:
Taking the information from the seminars, the regular animal care consulting and the BMPs to provide hands-on training for farm management groups and their employees. Helping to gain compliance and affirm the relationship between the employee and employer, we also develop monitoring of training tools for our producers as well as for our own initiatives as an accountability strategy to look at/initiate changes to our accepted practices as necessary.

On-Farm Welfare Assessments:
We provide the service of 2nd and 3rd party welfare assessments for our dairy and beef producers, including different levels of recommendations and regular follow-ups.

AVC Animal Health and Wellbeing Welfare program:
Intentionally spending time with each farm team, the herd veterinarian will review the AVC BMPs and collectively encourage the development and implementation of an animal care commitment that is personalized and team-approved for each dairy.

Training for Veterinarians:
Two members of our veterinary team have media training and the entire team continues to actively participate in animal care training seminars and accreditation courses as available to veterinary practitioners.

Promote Animal Well-being Medicine Options/ Alternatives:
Acupuncture, laser therapy, and thermography are some examples of the tools we are using to achieve leadership and success throughout different levels of veterinary medicine.
Being food animal veterinarians leading the industry we live and breathe mandates us to demonstrate leadership:

At the farm level:
By actively promoting animal health and welfare, aligning our farm owners to practice and promote exceptional animal welfare and well-being, and educating/training our farm employees to practice exceptional animal welfare and well-being.

Within the animal agriculture industry, amongst our colleagues and associations:
By serving as professional resources, collaborating within our industry, and enhancing animal welfare initiatives.

For our consumers:
Supplying the tools for consumer education that gives an accurate view in to animal agriculture and the outstanding care we provide for food producing animals.

Dr. Tye Perrett

Dr. Tye Perrett received his Bachelor of Science in Agriculture from the University of Alberta in 1995, and his Doctor of Veterinary Medicine from the Western College of Veterinary Medicine in 1999.

After graduation Tye joined the Lethbridge Animal Clinic as an associate and then a partner in the practice. In 2004 he became associated with Feedlot Health Management Services Ltd. and is currently a Managing Partner. He has been a director as well as president of both the Western Canadian Association of Bovine Practitioners, and the Canadian Association of Bovine Veterinarians. In 2012 Tye was the recipient of the 2012 Boehringer Ingelheim Western Canadian Association of Bovine Practitioners Veterinarian of the Year Award.

Tye, Tanya and their 5 boys very much appreciate living on their small acreage just outside of Okotoks where they spend time enjoying their horses and are active in church and sports activities.

Welfare related benefits in health and economics are arguments a producer understands

Dr. Tye Perrett
Feedlot Health, Canada

The Terrestrial Animal Health Code published by the OIE outlines guiding principles for animal welfare in livestock. One of these guidelines states,

"That the use of animals in agriculture, education and research, and for companionship, recreation and entertainment, makes a major contribution to the wellbeing of people."
(OIE Terrestrial Animal Health Code 7.9.5)

Animal agriculture truly does make a significant contribution towards the well-being of people through the provision of lifestyle, income and a purposeful life for those involved. In addition animal agriculture is a key component that assists with fulfilling one of people's most important needs – food. Thus, the well-being of animals and people are inextricably linked, such that at some level, one's well-being cannot exist without the other. Therefore, not only is there an ethical responsibility to be good stewards of the animals in our care, but in addition, animal care is in our own self-interest to ensure the well-being and sustainability of the human race.

The methods of assessing the level of welfare can be complex and varies over a wide spectrum, from complete anthropomorphism to measuring physiological, neuro-endocrine and behavioral parameters to production and economic outcomes. Utilization of this entire spectrum provides a comprehensive approach to not only measuring animal well-being but also in pushing the science forward so that the industry can continually improve the level of animal welfare. Certainly extrapolation from human experience is valid when assessing the relative level of pain and/or discomfort animals may feel in certain situations and this does not require further quantification to justify avoidance or correction of the situation. In other cases it can be more difficult or not appropriate to extrapolate in a logical fashion from the human experience and thus measuring physiological, neuro-endocrine and behavioral parameters can provide insight into the animal's experience. In these cases and in cases where measuring physiological, neuro-endocrine and behavioral parameters provide equivocal results, assessing the effects on production and subsequent bio-economic modeling quantifies the opportunity for improvement in animal welfare in tangible economic terms.

Describing the broader effects of the intertwined animal-human well-being matrix is a task for the social scientist, and is best left to experts in that field.

In this presentation I was asked to focus on the economic effects of the application of animal welfare principles in beef feedlots. When the implementation of an animal welfare principle results in economic benefits to the producer then the level of adoption is relatively widespread and rapid throughout the industry. These situations represent complete alignment between the producer's and the animal's well-being which is a strong motivator towards action.

In order to demonstrate economic benefits to feedlot producers, there must be improvements in the biological outcomes of economic importance in feedlot production. These are morbidity, mortality, average daily gain, feed conversion and carcass characteristics. Comprehensive, robust economic models can be used to calculate the net economic effect of changes in these biological parameters. In order to quantify changes in biological production outcomes with a high degree of accuracy, comparisons should be conducted in commercial feedlot settings using the randomized, replicated commercial field trial model. In some cases it may be appropriate to conduct some of these commercial studies in small pen facilities (10 – 100 animals per pen) but the commercial applicability improves dramatically and the bio economic modeling is more accurate when these studies are conducted in large pen commercial feedlot facilities (200 – 300 animals per pen). All of the economically important biological production metrics need to be captured in order to achieve an accurate picture of the total effect on commercial feedlot production.

However, it should be noted that the application of animal welfare principles in feedlots cannot always be distilled into positive economic outcomes. There are a variety of reasons as to why that is the case, but some may include:

- The action does not improve animal welfare
- The action provides transitory improvements in production that are not sustained throughout the entire feeding period
- The improvement in animal welfare cannot be detected via production metrics
- There was not an animal welfare deficiency

Understanding why the implementation of an animal welfare principle doesn't result in a positive economic outcome is essential as it helps shape the next steps required to drive the science of animal welfare forward.

The feedlot industry as a whole in North America has a history doing "the right thing" and of continual improvement with respect to animal welfare. There have been milestones and there are more to come as the science surrounding animal welfare of feedlot cattle continues to progress and is adopted by the industry. These advancements in animal welfare in feedlot cattle can be hastened when positive economic outcomes are also achieved.

This presentation will use examples related to pain control at the time of castration, sick animal detection and treatment, pen floor conditions, animal handling as well as managing chronic disease and non-responders to demonstrate the assessment of economic benefits associated with the wellbeing of feedlot cattle.

Notes

Prof. Cassandra Tucker

Dr. Cassandra Tucker grew up in southern California and studied Animal Science and Management at UC Davis, California. She conducted her Ph.D. work in the Animal Welfare Program at UBC (Vancouver, Canada) and worked for 3 years as a scientist at AgResearch (Hamilton, New Zealand). Ultimately, she returned to UC Davis in 2007, where she was promoted to full Professor in 2015.

Research in Cassandra's laboratory focuses on assessment and improvement of animal welfare in dairy cattle. Her research examines what animal behavior tells us about how animals see their world. She is particularly interested in how the behavior of dairy cattle changes in response to controversial procedures (e.g. tail docking, disbudding), management decisions (e.g. stocking density), and housing design (e.g. type and quantity of free-stall bedding, effects of inclement weather).

Much of Cassandra's work involves applying knowledge on pain behavior to create practical improvements in how we care for animals. She wants to understand the best way to care for cows in order to improve their comfort.

From the lab to life: taking research findings into the world

Prof. Cassandra Tucker
UC Davis, USA

Scientific inquiry can be categorized by how the resulting knowledge is used. So-called "basic" inquiries are conducted solely for sake of acquiring new knowledge. In contrast, "applied" questions have a direct connection to practical problems or challenges in the world today. In this type of work, we explicitly want to generate knowledge to inform specific practices or address specific problems. Both basic and applied research are important for society, but, in my lab and in many groups studying animal welfare, I focus largely on applied questions. I will provide several examples of how I take our discoveries out into the world.

Conduct research on commercial farms: an epidemiological approach

One way to take research results out into the world is to conduct it there in the first place. Using an epidemiological approach involves evaluating patterns in how animals are kept on commercial farms (housing, management) and how they respond to these environments. This approach has been used widely and can provide relevant and useful information. We recently examined the health and behavior of beef cattle being worked in a chute on 30 California cow-calf ranches. We found that ranchers varied in how they handled their animals. For example, some ranchers never used an electric prod, while others used it on 75 % of their animals . Using this variation, we identified that cows touched with an electric prod were more likely to balk, vocalize, stumble and fall in the chute, and stumble and run as they exited . In addition to generating knowledge about how management practices affect cattle behavior, we also provided each participating ranch with a benchmarking report, showing them how they compared to the other 29 ranches in the study.

Conduct research on commercial farms: controlled experiments

From time to time, it is also possible to conduct controlled studies, or compare 2 or more treatments, on commercial farms. This approach allows us to ask questions that require a larger sample size than what is available at many research farms, for example to study relatively rare diseases. Conducting experiments on commercial farms also provides more certainty that the conditions represent the industry at large, compared to university research facilities. For example, the first experiment I conducted compared mastitis incidence and cleanliness of

dairy cattle that had either intact or docked tails on a 500-cow dairy. This opportunity provided evidence that, despite a widely held belief at the time, docking provides no health or cleanliness advantages under commercial conditions. Others also replicated our findings using a similar experimental design on 8 commercial herds .

Provide expertise for decision makers

More broadly, there are numerous decision makers generating recommendations or requirements about how farm animals are housed and managed. For example, results from research are often incorporated into animal welfare audits within the supply chain, industry guidelines about best practice and other policy decisions. The role of scientists play in these decision making processes varies among contexts. Sometimes scientists create audit guidelines and supporting materials. For example, Dean Foods and its scientific advisors recently developed a dairy welfare audit tool that will be implemented on commercial farms. This document and approach to welfare assessment was strongly shaped by the degree of evidence supporting each key audit point. Other times, scientists are part of a team of advisors for industry groups. For example, National Milk Producers Federation reviews their Farmers Assuring Responsible Management Program every 3 years and a technical writing committee comprised of veterinarians, industry representatives and scientists provide feedback about the recommendations during each review. In this case, after the technical writing committee has done its work, others within National Milk Producer's Federation incorporate public comments about the recommendations and finalize decisions about their entire program. Lastly, research is also incorporated into policy through the availability of results within the scientific literature. For example, the findings from studies about tail docking have been cited in the background for legislation about the practice (e.g. ban of docking in California) or policy positions .

Engage with stakeholders: producers, veterinarians, allied industry, and the public

Engaging with producers, veterinarians, allied industry and the public is another way to take research findings into the world. This type of engagement takes many forms including presentations, media interviews, writing for the popular or industry press, and holding workshops or farm tours. Recently, in an effort to make research findings described earlier directly available to as many cow-calf producers (and other interested parties) as possible, my lab has developed a free website to provide training for animal welfare assessment *(http://www.ucdcowcalfassessment.com).* The website provides detailed instructions for ranchers/assessors and defines how to evaluate each health and handling measure. Gauging the effectiveness and success of this type of engagement is a challenge and is often anecdotal. However, even anecdotal feedback can be meaningful, at least to me. Hearing that a talk I gave or that an article I wrote influenced a producer or rancher's decision is rewarding for me.

In conclusion, it is an exciting time to be an animal welfare scientist asking applied questions about farm animals. There are numerous ways to take our discoveries out into the world, from how and where we conduct our research to advising and engaging stakeholders.

Notes

Prof. Michael Ballou

Michael Ballou is an Associate Dean for Research and an Associate Professor of Nutritional Immunology in the College of Agricultural Sciences and Natural Resources at Texas Tech University. He completed a Bachelor's degree in Animal Science from the University of California, Davis in 2002. Michael remained at UC Davis and completed a Ph.D. in Nutritional Biology with an emphasis in Immunology in 2007. Michael's research is primarily focused on how nutrition and management influence the health and performance of dairy calves, heifers, and transition cows.

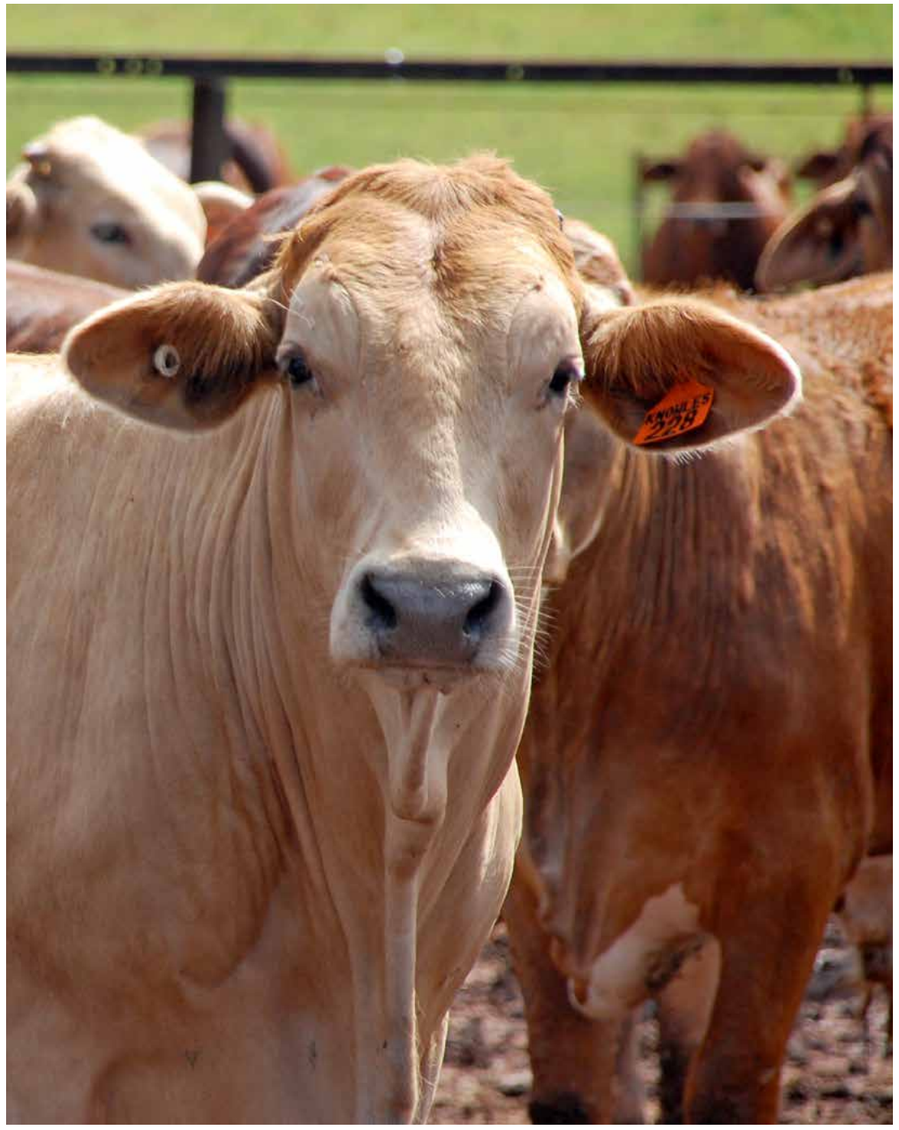
He has authored or co-authored 45 peer-reviewed articles, 1 book chapter, and 89 scientific meeting abstracts. Michael has received research support from private foundations, industry, and the USDA. He is married and has 2 children, a 17 month old daughter and 2 month old boy.

Influence of stress and pain on immunity

Prof. Michael Ballou
Texas Tech University, USA

- Management procedures are imposed on livestock for a variety of reasons, including: improved animal well-being, performance, product quality, food safety, and farm safety.
- Unfortunately, some management procedures used in livestock industries are potentially stressful or may cause temporary pain.
- Stress is commonly referred to in the etiology of infectious diseases; however, stress is a natural physiological response that is important in promoting a response to a treat or adaptation to change.
- Therefore, the paradox is that stress is both crucial for adaptation of livestock to change, but also may increase the risk for infectious disease under certain circumstances.
- The immune system is made up of many components, and a breakdown in any aspect may increase the likelihood of disease.
- The type and degree of stress are likely important in the overall effect on the immune system and risk for infectious diseases.
- There is a need to better understand strategies that reduce stress and pain imposed by management of livestock, ultimately improving livestock well-being.

Stress is referred to in many contexts and the meaning is often subjective. Hans Selye was the first to coin the term stress in 1936 and he defined it as, "the non-specific response of the body to any demand for change". Selye performed experiments in laboratory animals and observed consistent pathological changes in animals, including: lymphoid atrophy, stomach ulcers, and enlargement of the adrenal glands, in response to various psychological and physiological challenges. I will accept his original definition to evaluate what are some potential stressors that livestock may be exposed to during life. Livestock are not that different from humans in what causes stress. Have you ever wondered why livestock are creatures of habit? It is the same reason that humans are creatures of habit or that humans are most comfortable when they are in a routine. It basically boils down to control. Change or uncertainty causes a loss of control, whether you're a human or a livestock animal. Common laboratory models of stress involve taking the control away from the subject. An example would be put a loud alarm in the room housing subjects that goes off randomly throughout the day. The alarm must be set to go off randomly so the animals cannot adapt to the alarm. In contrast, if the alarm goes off at a regular interval the animals will regain control of the situation and therefore adapt.



Other common laboratory stress models include physical restrain, social re-organization, or inability to move away from a painful stimulus. If we apply the principle that a significant change or pain can cause a loss of control and the stress response is the physiological response to help the animal regain control then we must understand what changes are potentially stressful to livestock. Generally the changes that may occur during the life of livestock can be broadly classified as either psychological or physiological.

Let's first consider the psychological or social stressors that livestock may encounter. Livestock are often sorted and/or moved, which increases the potential for social re-organizing that can persist for 3 to 7 days. von Keyserlingk et al. (2008) reported increased competition at the feed bunk, decreased lying bouts, and reduced allo-grooming events the day after a single lactating cow was introduced into a stable population of 11 lactating cows. Further they reported that the new cows displaced other cows at the feed bunk twice as much as they did before they were moved. The displacement behaviors are noteworthy because they indicate competition or aggressive/submissive actions. A lot of livestock are raised in confinement and the temptation to maximize facility space can result in overstocking. We'll define overstocking as the number of animals per pen exceeds available resources (i.e. access to feed and/(or) a comfortable place to rest), which creates unnecessary competition. Devries et al. (2004) reduced feed bunk space allowance from 1.0 to 0.5 m per lactating cow and observed increased aggressive behaviors and the subordinate cows had reduced feeding time within 90 min. of feeding. When management creates competition among cows, there are winners, but there are also losers. This will increase the risk that the subordinate cows will be stressed.

In addition to social organization with other animals, livestock are often stressed when they are processed and handled by workers, especially if it is a novel experience. Hulbert et al. (2011a) reported that temperamental bulls had greater changes in leukocyte function and took more time to recover after a combined handling and transportation when compared to the calm bulls, so animal temperament also plays a role in the response of livestock to social stressors. Changes in feed, either composition or time of feed delivery can stress livestock. Hulbert et al. (2011b,c) reported that weaning and switching dairy calves from twice-a-day milk feeding to once-a-day milk feeding transiently altered leukocyte responses of Holstein calves.

In addition to the psychological stressors, there are many physical changes that occur during the life of livestock. Early in life there are many management procedures that are physically painful, including castration, dehorning, tail docking, teeth clipping, and identification with ear notching or tagging. Ballou et al. (2013) reported that both surgical castration and physical dehorning of 3 month old Holstein bull calves was painful and suppressed many leukocyte responses. Interestingly, the cortisol response was additive when the 2 procedures were performed together, but the suppressed leukocyte responses were not additive. Additionally, they reported that the combined use of a local anesthetic and systemic analgesic attenuated or prevented the physiological and leukocyte responses of both procedures when performed separately or together. These data indicate that it is likely better to perform these 2 management procedures together at the same time, but also administer pain relief.

There is evidence that livestock are exposed to many potentially stressful and painful events in their life and many of them may overwhelm their ability to adapt, which increases the likelihood the stressful situation will alter the immune system and increase the likelihood for infectious diseases. The industry will continue to better understand and alter management strategies to reduce these sources of stress and pain.

Prof. David Kelton

David Kelton holds the DVM, MSc and PhD degrees, all from the University of Guelph. He is a professor of veterinary epidemiology and the Dairy Farmers of Ontario Dairy Cattle Health Research Chair in the Department of Population Medicine, Ontario Veterinary College, University of Guelph. He is a member of Scientific Committee of the Canadian Bovine Mastitis and Milk Quality Research Network, the Canadian Representative to the International Dairy Federation Standing Committee on Animal Health and Welfare, 2nd Vice-President of the National Mastitis Council and a Director on the Board of the Evidence Based Veterinary Medical Association.

David teaches dairy cattle health and management, as well as evidence-based veterinary medicine, in the undergraduate, graduate and professional curriculum and is a member of several local, provincial and national working groups dealing with dairy cattle health and animal disease surveillance. He has co-authored more than 160 manuscripts in refereed journals.

Prof. Kelton's research interests include paratuberculosis (Johne's Disease), bovine mastitis and bovine lameness, with a focus on their detection and control in dairy herds and their impacts on health, productivity and welfare.

Can Big Data help improve animal welfare on dairy farms?

Prof. David Kelton
University of Guelph, Canada

Big data in dairy production systems

The term 'big data' is used in many contexts in our high technology world. It is most commonly used to describe very large volumes of structured and unstructured data that are so dense and complex that our traditional approaches to processing and analysis are generally inadequate for extracting their secrets and using them optimally. While we generally think of 'big data' in the context of large population sources aggregated in the 'cloud', thanks to the sensor evolution in animal agriculture we are now facing 'big data' challenges and opportunities on our dairy farms.

In dairy production and herd management, the sources of big data are varied and continue to change over time. Until fairly recently, farm management data have been derived from animal events recorded by the farmer, often coupled with monthly milk test data captured through the Dairy Herd Improvement (DHI) system. These data could be easily manipulated by herd owners and advisors using spreadsheets and herd management software on desktop computers. Over the last ten years the data sourcing and capture has changed dramatically due to the many sensors that have become integral parts of the modern dairy farm, and which are capable of generating data every hour, minute or second. Sensors on milking equipment are used not only to measure milk production by individual cows, but to determine individual component yields (fat and protein) and to identify constituents in milk that indicate suboptimal health of the cow. These health indicators include direct and indirect measurement of somatic cells, electrical conductivity, LDH (lactate dehydrogenase) and milk color as indicators of mastitis; BHB (beta-hydroxybutyrate) and MUN (milk urea nitrogen) as indicators of energy metabolism; and progesterone for determining pregnancy and cyclicity. Rumen boluses can record and transmit data about rumen activity and core body temperature. Collars and leg bands measure steps, as well as lying and standing bouts, and their duration. Ear tags can record a cow's physical location in a barn or yard, as well as her core body temperature. Floor pressure plates are used to record the weight of the cow and/or the weight carried by each leg, while cameras are used to measure body condition and surface temperatures of claws and the udder. Advanced feeding systems for cows and calves capture volumes and/or weights of feed consumed by groups or individual animals. Environmental sensors record light exposure, ambient temperature and humidity, which describe micro-climates in barns, rooms or pens.

Most of these sensors are currently used by simple single-source algorithms for limited decision making. They present a major opportunity to develop more complex decision models, utilizing many inputs, to improve farm productivity, efficiency and animal care.

Opportunities to use Big Data to improve animal care

Animal care has become the focus of many dairy quality assurance programs, including Canada's proAction initiative *(https://www.dairyfarmers.ca/what-we-do/programs/the-proaction-initiative-on-farm-excellence)*. Key areas of focus include lameness, injury, body condition and pain mitigation. The recently completed National Dairy Study 2015 indicates that lameness and hock injuries continue to be a major problem on many Canadian dairy farms, with less than 20% of farms meeting the proAction targets for lameness and only 35 % meeting the targets for injury (Kelton, 2016). Mastitis is commonly cited as the most important and costly disease on dairy farms, with approximately one in four cows experiencing at least one clinical mastitis case during each lactation (Dufour, 2013). Earlier detection and intervention of lameness and clinical mastitis could not only serve to increase animal care and welfare, but might offer other advantages such as a reduction in the use of antibiotic treatments. Lameness detection could be accomplished through use of almost instantaneous data from force plates, accelerometers, cameras and inter-milking intervals (in automated milking systems). Clinical mastitis detection should be possible using conductivity, cell count, LDH and milk yield data from every milking. Algorithms are being developed and evaluated with the goal of implementing detection systems that are both sensitive (identify all cases) and specific (minimize false positives).

Challenges to use of Big Data to improve animal care

While there are many potential sources of sensor data that can theoretically be used to automate lameness detection, attempts to develop algorithms that are both sensitive and specific have been disappointing. A recent review by Van Nuffel et al. (2015) described lameness detection systems based on load cells, position censors, computer vision and accelerometers. The authors concluded that there are no efficient automated lameness detection systems based on these many single data input sources, and noted that while some systems are able to detect severely lame cows, the greater need is to identify mild lameness cases that would most benefit from intervention. The early mastitis detection issue is similarly frustrating. While individual sensors are sensitive enough to identify changes in milk composition that signal a bacterial 'challenge', they are not nearly specific enough to reduce the false positive alarms that frustrate dairy producers and veterinarians.

There is currently a clear inability of a single sensor to distinguish between a bacterial incursion into the mammary gland that the cow can and will deal with on her own, from one that will persist and could benefit from early intervention.

It is quite likely that the solutions to these issues will not come from developing a better sensor, but from utilizing inputs from many sensors, perhaps manufactured and sold by competitors, in combined decision algorithms. These problems may well require a 'big data' solution, using data from several sensors, under a variety of farm conditions and compared to the best available gold standard(s). These data cannot come from dedicated research facilities alone, but from commercial farms representing a variety of management styles, requiring application of solutions for data capture, sharing, transfer, storage and security. Overcoming these challenges may create the breakthrough opportunities to utilize the available sensors for the maximum benefit of dairy producers and the animals in their care.

References

Kelton D, Croyle S.:
Animal care assessment summary from National Dairy Study 2015 herd visits. March 2016. Ceptor – Animal Health News 24(1).

Dufour, S.; Dohoo ,IR.:
Monitoring herd incidence of intramammary infection in lactating cows using repeated longitudinal somatic cell count measurements.] Dairy Sci 2013 Mar; 96(3): 1568 – 1580.

Van Nuffel, A.; Zwertvaegher, I.:
Van Weyenberg S, Pastell M, Thorup VM, Bahr C, Sonck B, Saeys W. Lameness detection in dairy cows: Part 2. Use of sensors to automatically register changes in locomotion or behavior. 2015. Animals 5: 861 – 885.

Prof. Hans van Trijp

Prof. Hans van Trijp is Professor of Marketing and Consumer Behavior at Wageningen University in the Netherlands, a job which he has combined for many years with a part-time affiliation at Unilever Research and Development in Vlaardingen, The Netherlands. He is a Human Nutritionist by Education, but early on in his career moved to consumer behavior and marketing. After finishing his PhD work on “Variety seeking in product choice” at the Marketing and Consumer Behavior Group of Wageningen University, he moved to Unilever as Senior Scientist on Consumer Behavior for New Product Development. In 2001, he returned to Wageningen University as Chair in Marketing and Consumer Behavior.

Research within his group focuses on Social Marketing approaches: the application of scientific insight into farmers’ and consumers’ behaviors as a basis for the design of marketing strategies that can help (a) consumers to make more healthful and sustainable choices, and (b) farmers to build a better livelihood from adequate market access. Key topics build on business strategies related to sustainable production and marketing of foods, including such diverse issues as animal welfare, personalized nutrition, (healthy) food reformulation, and new technology acceptance. Theoretically much of the research is inspired by Social Dilemma Theory and Construal Level Theory.

Compromise products to encourage animal friendly consumption

Prof. Hans van Trijp,
Wageningen University, The Netherlands

Animal welfare is increasingly becoming an issue of concern among consumers in many different countries, but certainly in Europe. The increasing discomfort / concern seems to be part of a broader recognition of sustainability-related issues in modern food production and - marketing. Interestingly, despite the identification of such concerns voiced by consumers in surveys on consumer attitudes, the market share of sustainable products, including animal welfare products, remains low but with substantial differences between countries and (animal-related) product categories. In marketing terms this would be labelled as a “latent” demand on the part of the consumer.

The fact that many consumers feel uncomfortable with intensive meat production, and that such concerns are likely to be further fuelled by media attention in the future, raises the question what the meat sector can and should do in response. This is far from a trivial challenge for several reasons. First, the fact that the demand at the consumer side is “latent” implies that, for the majority of consumers, it is not necessarily supported by purchasing power and willingness to pay for welfare enhanced products. Second, for a sector which is largely built on efficiency from large volumes and small margins, any deviation from current practice will likely incur short term costs (irrespective of gains in the longer terms). The question is whether the industry conditions can allow such ‘transformation”, or whether the industry is “locked into” its current practice.

Marketing theory would suggest that if there is differentiated demand in the market place, perfect markets would “automatically” adjust to it by exploiting the benefits of specialisation. In the context of meat products, we do not (yet) see this happen to great extent, as it is still mainly characterised by a commodity approach, with only a very limited segment of high level animal welfare products (organics). This has led to highly divided assortments with a huge segment of conventional low priced meat and a very small segment of high priced organic meat, and with high price promotion activity within the supermarket space (as low priced meat can act as a “traffic generator” to retail).

The presentation will analyze this situation from a consumer point of view. We will argue that at all levels of the chain, but certainly at the level of consumer behavior, there is a social dilemma at stake that works against further differentiation in the market place.

Social dilemmas represent conflicts between short-term personal interests on the one hand and long term societal interests at the other. Social dilemma's lead to internal mental conflicts and can help explain the prevalent discrepancies between "want-to-do" versus "actually do", at the consumer psychology level also known as "attitude-behavior gap".

Analysis of the social dilemma in the animal welfare situation, suggest various approaches that could be instrumental in mitigating such dilemma. These include increasing the minimum standards at the industry level (to ensure a level playing field), to increase transparency and trustworthiness of the sector through labelling and branding, and to increase product differentiation in the market place. Marketing theory would suggest that the social dilemma needs to be managed, and that it can be done so if product differentiation in the market place is more closely aligned to the diversity of consumer needs. This is the approach that we will illustrate during the presentation from empirical data. We will use evidence from our research in poultry products in the Netherlands, to show that increasing product differentiation in terms of animal welfare levels can actually be a good way forward for the meat industry. Increasing product supply in terms of varying levels of animal welfare, supported by a reliable and trustworthy animal welfare label, can actually bring benefits at three levels:
(a) it is good for industry as more consumers will continue to be customers of meat,
(b) it is good for the consumer satisfaction as he/she can more likely find the products specifically desired, and
(c) is good for the animal as the animal welfare level increases.
So in conclusion, and open for further discussion, there seems to be room for the meat industry to move beyond its current commodity thinking in taking more pro-active marketing approaches aimed at "serving some without losing others". It would require the meat industry to reflect carefully about why such marketing approach is less likely to "take off" within this industry and what are the potential "current system lock-ins" that withhold the industry from moving stronger and faster in the direction of other industries where this is (more) common practice.

Notes

Crystal Mackay

Crystal is the Executive Director for Farm & Food Care Canada and Farm & Food Care Ontario, with a shared vision for building public trust in food and farming in Canada. Farm & Food Care represent a coalition of farmers and associated businesses proactively working together with a commitment to provide credible information and strengthen sustainable food and farming for the future. Crystal is a dynamic presenter who has delivered hundreds of presentations to a broad range of audiences from farmers to university students to CEOs across North America.

Crystal was raised on a beef and dairy farm in the Ottawa Valley. She is a graduate of the University of Guelph, the Advanced Agricultural Leadership Program, and the George Morris Centre Executive Development Program. She is a past President of the University of Guelph OAC Alumni Association, and a former director of both the Ontario 4-H Foundation and the Poultry Industry Council.

She enjoys spending time with her young family and playing hockey whenever she gets the chance!

The importance of social license in agriculture

Crystal Mackay,
Farm and Food, Canada

Have you heard the new “s” term for farming and food? It’s “social license,” followed closely by “sustainability.” These are not new to other sectors but seemed to have taken those who farm or produce food in this country by surprise. Are Canadian farmers really in danger of losing their social license to farm?

Since time began, farmers have been feeding their families, communities and the world.

When my great grandparents were farming (on land now occupied by Pearson International Airport), most people had a connection to the farm and understood where their food came from. Consumers knew farmers and trusted that they were doing the right thing as long as there was food on the table.

Fast forward to 2015 – an era of radical transparency and escalating demands.

Farm & Food Care studies of Canadian consumers show that 93 percent said they knew little or nothing about where their food comes from, but their interest in knowing more has never been higher. It makes sense then that celebrities and social activists (think Dr. Oz or the Food Babe) can get a lot of attention when they spout inaccurate or scary data about food or farming with more regard to ratings, popularity or fundraising than facts.
Compared to other parts of the world, Canadian farmers still enjoy a reasonably good degree of public trust. In the UK and the US, public trust in food systems has been eroded by well-orchestrated and funded pressure tactics and negative media; both of which are gaining momentum in Canada.

In speaking to a Canadian audience, Dr. Sandra Edwards, Chair of Agriculture, University of Newcastle said,
"Canada is exactly where the UK was 20 years ago on public trust. UK agriculture was arrogant and ignored the importance of public trust, thinking 'everyone has to eat and people like farmers. We took public trust for granted until it was too late and the demands on farmers quickly made the UK farmer uncompetitive with other jurisdictions on many fronts."

What does losing public trust or your "social license" really mean? Loss of public trust from the public or buyers can lead to increased regulation, burdensome market access requirements, and potential loss of customers or freedom to operate. Like a tipping point, once public trust is lost, it may be impossible to regain.

The issues will continue to ebb, flow and ignite around specific issues like food safety, waste, energy and water use, hormone and antibiotic use, animal welfare, fair labor practices and more.

So how should farmers and agri-food businesses respond to public perceptions, media scrutiny and consumer demands?

Building public trust in food and farming must start with doing the right things for the right reasons. Farming – and producing food sustainably – needs to be scientifically verified, economically viable and ethically grounded. Millions of dollars in research, programming and countless hours of hard work on farms help make this happen. But the average Canadian hasn't heard that story.

All stakeholders need to be transparent about their practices and open to communicating with the public. Because, as other sectors like oil and forestry have learned the hard way, building public trust is not a short term public relations exercise. It requires a long term vision and a significant commitment of resources by the entire sector. Every stakeholder - from the individual farmer through to the CEO of our country's largest food companies – needs to invest in conversations with Canadians to build public trust. If we want to reshape the trends from the UK, the EU and the US, everyone who farms or makes a living from agriculture and food needs to create a business plan for the new "s" words and start investing in public trust and their social license.

Notes

Prof. Bernard Rollin

Bernard E. Rollin is Professor of Philosophy, Biomedical Sciences, Animal Sciences, and University Bioethicist at Colorado State University.

Rollin taught the first course ever done in the world in veterinary medical ethics, which has been a required part of the veterinary curriculum at CSU since 1978, and was a pioneer in reforming animal use in surgery teaching and laboratory exercises in veterinary colleges. He is a principal architect of 1985 federal legislation dealing with the welfare of experimental animals, and has testified before Congress on animal experimentation. He has consulted for various agencies of governments and numerous multinational corporations on many aspects of animal research and other animal issues. In 2008, he mediated a historic agreement between the Humane Society of the U.S. and Colorado agriculture resulting in legislation advancing the welfare of farm animals.

Rollin has lectured extensively on animal ethics, genetic engineering, animal pain, animal research, animal agriculture, veterinary ethics and other topics in bioethics and philosophy.

He is the author of over 500 papers and 20 books, of which the best known is *"Animal Rights and Human Morality"*.
Rollin has worked with animal scientists and ranchers on alternatives to castration and branding and other issues, and helped galvanize the agricultural community in Colorado to pass the nation's strongest "downer" bill. Rollin has addressed over 20,000 ranchers and farmers on animal rights and animal agriculture in forums ranging from the Houston Livestock show to local extension meetings, and enjoys excellent relations with this population. He is noted for garnering acquiescence to the notion that animals have rights from ranchers and even from rodeo people. Rollin serves on the boards of numerous animal welfare organizations.

He was named University Distinguished Professor, Colorado State University's highest honor and received many awards from different organizations for his outstanding work in animal ethics.

Rollin is a competition-level weightlifter and a Harley rider.

Veterinary ethics

Prof. Bernard Rollin,
Colorado State University, USA

Until very recently, veterinary ethics dealt with etiquette, rather than genuine ethics. This is difficult to understand, since the major problems confronting veterinary medicine are indeed ethical. Yet, in the US, there exist virtually no courses in veterinary ethics, taught in veterinary schools.

The biggest ethical question facing the profession is whether veterinarians have primary obligation to animals or owners. Ethical constraints facing veterinary medicine include issues of societal ethics, personal ethics, and professional ethics. Veterinarians have moral obligations to clients, society, peers and the profession, themselves, their employees, and animals. The societal consensus ethic for animal treatment has traditionally been extremely minimalistic and close to vacuous, since it essentially only forbids *deliberate cruelty*.

In recent years, as society has become increasingly concerned about animal treatment, demand for a new ethic has been forthcoming, since the anti-cruelty ethic does not cover *"normal uses of animals"* that generate pain, suffering, and distress, such as industrial agriculture and animal research. The primary reason for this has been a change in animal use, particularly in agriculture, where good husbandry has given way to an industrial approach, generating suffering not attributable to cruelty, but rather to such putatively decent human motives as creating a cheap and plentiful supply of animal products used as food. New ethics, however, does not appear *ex nihilo*, but proceeds from pre-existing ethics. Thus society has looked to our ethic for human beings, *mutatis mutandis*, to generate the new ethic for animals.

Like humans, animals have natures, or *telos*, from which interests flow, the thwarting or fulfillment of which matter to animals. In human ethics, a tension traditionally exists between the interests of individuals, as dictated by their *telos*, and the general welfare or common good. In human ethics, we balance the interests of the general welfare with the interests of individuals by creating "*protective fences*" around individuals, shielding them from what has been called "*the tyranny of the majority.*" In democratic societies, these fences are called "*rights.*" Thus for example, we argue that humans have the right to speak freely and express themselves, even if this causes great irritation and concern to the majority. Similarly, we protect individuals from having property seized, even if such seizure benefits society as a whole.

It appears that society is in the process of extending the notion of rights to animals, judging for example from the fact that, in 2004, fully 2100 legislative bills were promulgated in the US protecting animals. Although traditionally, animals were protected in agriculture by the demand for "*good husbandry*", the commitment to husbandry is a thing of the past. Thus, if society wants proper treatment for animals that no longer occurs naturally the way husbandry did, making agriculture possible, the majority of society wants to see it legislated, even though, strictly speaking, as enjoying the legal status of property, animals cannot have full rights. Thus, current social ethics favors the view that veterinarians have primary obligation to animals, rather than to human owners.
In the US, 70 % of the public wishes to see the equivalent of such "rights for animals encoded in law. The veterinary profession, however, has been extremely resistant to such ethical change, even though social thought is in the process of embracing rights or their equivalent, for animals.

Notes

Dr. Jennifer Walker

A California Native, Jennifer earned her Bachelor's in Animal Science (1994) and her DVM (2000) from the University of California at Davis. As an associate veterinarian in a California practice specializing in dairy herd health she developed her interests in on-farm education, udder health and animal welfare. In 2010 she completed her PhD in Veterinary Preventive Medicine at The Ohio State University where she also minored in University Education. Her work in education included the development and delivery of a graduate level course, "Current Issues in Animal Welfare" in addition to serving as an Assistant Instructor for the required veterinary ethics course, leading lectures on humane euthanasia and animal handling.

Jennifer joined Dean Foods as their Director of Dairy Stewardship in July of 2010. In this role she has been putting to use her expertise in on farm milk quality and passion for animal welfare by working with customers, suppliers, dairy farmers to develop an industry wide standard that promotes the good welfare of dairy cattle. Over the last five years she has had a firsthand view of the intersection between politics, policy, profit and people and how it can drive positive change in animal welfare as much as it can hinder it.

Living up to consumer expectations – Animal welfare audits in dairy, the new normal

Jennifer B. Walker
Dean Foods Co., USA

Whether you call them audits, evaluations or certifications, the reality is that anyone involved in food production today will have to demonstrate compliance to some standard through programs mandated at some point in the supply chain. While many feel as if animal agriculture has been thrust into the animal welfare debate, the reality is, other segments of animal agriculture have been entrenched in the conversation for years while the dairy industry has, until recently, remained on the periphery. However, the last several years have seen an onslaught of undercover videos targeting the dairy industry and its customers.

Developing an effective and defensible approach to animal welfare requires that we recognize the similarities and differences across industries that have already faced the issues, some more successfully than others. It also requires that we understand what consumers and customers are seeking. But most importantly it requires that we empower the caregivers and stewards on the farm to promote and safeguard the welfare of dairy cattle. Accomplishing either one of these tasks alone will not be sufficient in meeting the challenges that lie ahead. We must be successful at each task.

While modern agriculture has focused on efficiency and production, relying on science to prove *what can be done*, consumer trust has been compromised as they question whether agricultural systems share their core beliefs about *what should be* done. Consumers expect us to tend to the welfare of the animals in production systems and we have moved from a social contract between the farmer and their stock to striving to maintain what is now a *social license* granted to us by consumers to benefit from the use of animals (Jamison, 2010).

The welfare of dairy cows covers a broad spectrum of concerns rooted in society's views of the role animals play in our lives. Consumers have become increasingly conscious of animal welfare issues, and they expect that dairy cows and other animals involved in animal agriculture are provided for in a way that respects their nature and strives to ensure good welfare. Clearly, consumers expect that abuse or neglect of animals is neither condoned nor permitted. But beyond that obvious expectation, we build and maintain consumer trust by demonstrating that we share a common ethic about animal welfare. If we are to maintain our social license to benefit from animals in agriculture it is essential that we resolve that farm practices must be congruent with consumer values.

Our success will be dependent on our ability to assure consumers that we are doing the right thing and our ability to prove it.

Our success will also depend on our willingness to accept that changing consumers mind is only a part of the solution. Agriculture needs to be willing and ready to reconsider and discuss current practices. While much of what we do is defensible and acceptable by the public, we have to acknowledge where improvements are needed and be open to change. Recognizing that change is required on both sides is the first step in building a more transparent system. As the disconnect between agriculture and the average consumer may be seen today more as a crevasse than a gap, patience and empathy will be key in developing the communication necessary to educate and reconnect both our consumers with the systems they depend on and farmers with the consumers they depend on.

One of the first steps in building trust is transparency. This has been successfully accomplished by the meat industry through 3rd party animal welfare audits. To understand how this success was achieved, one must understand what animal welfare audits actually accomplish. The reality is, there is no one size fits all. All audits are not created equal and they do not share the same goals. It is clear that consumer and customer expectations specific to the health and welfare of dairy cattle continue to evolve and mature. While special interest groups continue to capitalize on this concern to advance their cause, associating well-known brands with farms that are accused of being bad actors, there are an equal number of groups looking to use animal welfare to develop a market advantage. Much of this potential market advantage is the result of industries lacking the will or ability to implement a meaningful program that meets the needs of the majority of the supply chain leaving room for chaos and confusion in the animal welfare assurance market.

When it comes to developing animal welfare audits there are four fundamental motivations, each of which are not necessarily mutually exclusive, only one of which has demonstrated itself to be an effective approach: Risk Mitigation, Creating a Buffer, Developing a Market Advantage and Improving Animal Welfare. It is critical to recognize the differences between these approaches as they have a profound impact on the actual ability of a program to improve animal welfare.

In lieu of the agriculture industry proactively addressing the issue and developing standards, increasingly we have seen food service and retailers write guidelines implementing audits and animal welfare “requirements”. The motivation behind these efforts is two-fold: to provide consumers assurance that animals raised for food are treated humanely and to mitigate the risk of being associated with a farm accused of animal cruelty, neglect or poor husbandry. A variety of audits and animal welfare program formats have been implemented across the world and within the United States. While some have been developed by food retailers, more recently NGO’s and some for profit companies have entered the fray offering “certification” of animal welfare practices resulting in more than four available “certification” audits within the U.S. dairy market alone. Other industries including poultry and pork have not fared as well. Poultry, having been the subject of scrutiny long before others, currently accommodates separate audits for nearly every customer in addition to any “certifications” that may be required.

Audit companies have thus seized an opportunity to capitalize on the lack of industry leadership creating a variety of custom audits for each customer in addition to mass confusion within agriculture when it comes to animal welfare auditing. As of yet the only industry to avoid such confusion is the beef and pork packing industry. To understand why and how they have managed to minimize the chaos we need to understand more clearly how and why it manifests.

Risk Mitigation

Animal welfare audits motivated primarily by risk mitigation generally focus on identifying high risk farms and removing them from their supply. This is generally accomplished by individual companies creating specific standards and rules to which they require compliance. This approach can be successful for risk mitigation IF all of the potential risks are identified and the supplier or buyer has strict control and a very clear line of sight over supply. As a result this approach works best for relatively small business that do not require massive quantities of a particular animal product. However, this approach does not tend to actually improve animal welfare as typically the result is a “cherry picking” of good farms while it forces problems out of the buyers supply into another pipeline rather than actually addressing animal welfare problems. If animal welfare is improved, any improvements tend to focus on “visually oriented issues” like dehorning and tail docking, which are certainly valid animal welfare concerns, but such programs often ignore issues such as lameness and employee training which represents major welfare issues in dairy cattle and feed into these other issues directly.

Create a Buffer

Animal welfare audits, programs or policy motivated primarily by creating a buffer between the farm and the customer at some level in the supply chain, have exploded in recent years. These programs tend to be those in which limited if any enforcement is provided and are partnered with broad communication focused primarily on what the expectations are rather than how performance is monitored or success is achieved. While some of these programs can be exhaustive in their description of suggested best practices, others are ambiguous enough to allow for success to take many shapes and sizes. Every animal industry has offered up such programs and have even attempted to create the appearance of actual verification of best practices. Other versions exist simply in the communication ether provided by various companies that make public statements and publish documents about their “standards” while never actually auditing against them or enforcing them. Programs such as these may offer buyers the risk mitigation opportunity to identify high risk farms, remove them from their supply or require that corrective actions be made, the former being the more common solution. Some buyers may actually adopt a program and implement it with the intention of both mitigating risk and improving animal welfare. Unfortunately such efforts are more often than not inconsistent, resulting in the development of several different versions of what is supposed to be the same program which only serves to add confusion and increase risk by allowing customers and consumers to develop one expectation while several factions within the industry manage to their own.

Regardless of the approach, the communication to both customers and consumers alike creates a façade of assurance that benefits the supplier, buyer and customer, leaving the individual farmer with minimal protection or allies. These programs may actually represent a major risk for the individual farmer as they often "agree" to adhere to guidelines which are in actuality rarely enforced or audited. Thus far any enforcement appears to have minimal consequence or mandate yet, the communicated expectation by the buyer establishes cause by which buyers can terminate a supplier contract. As a result, if an individual farm finds they are the subject of an undercover investigation, any contracts are more often than not terminated immediately without an opportunity to defend their business.

Market Advantage

The most consumer facing approach taken in animal welfare auditing are those that either aim to take advantage of a market niche, create one or aim to change agricultural practices in the name of animal advocacy. The vast majority of these programs issue a label that can then be used to communicate to consumers that a certain "standard" has been met. Commonly seen labels are UEP certified (eggs), Red Tractor (in the United Kingdom) and Organic Certified. Less commonly recognized labels thus far include: American Humane Certified, Certified Humane, Animal Welfare Approved and Validus. Buyers that wish to market based on a certification or who are required to supply product from "certified farms" simply require that the farms be certified. The certification process is typically paid for by the farm directly to the 3rd party auditor. Farms are then audited against the "label claims".

While some audits require complete compliance, others use a point based system, while others may require no compliance at all. As with all programs there remains a fundamental question of "who is setting the standards?" While some programs are written with the input of academics with an established expertise in the welfare of the species of interests, other programs are written by a conglomerate of interested parties which may have little if any practical or expert knowledge in animal welfare. Several of these audits are also couched clearly on philosophical principles such as "organic", or "pasture based" which have little actual relevance to animal welfare at all, catering to consumer misperceptions and capitalizing on a market opportunity.

These systems can work to improve welfare if compliance to all of the animal welfare based standards is required. The failure of these systems to actually improve welfare stems from four fundamental flaws: (1) Point based systems without specific absolutes allow some farms to attain certification while not addressing serious welfare issues. (2) Because the farm is the entity paying the 3rd party auditing company there is a risk that the auditor is incentivized to provide a positive outcome to the farm. (3) Certification is typically executed in smaller markets which allows for "cherry picking", providing well managed farms the opportunity to take advantage of a limited market. The farms that are in need of the most attention typically do not pursue certification. (4) Farms are typically audited 1 time per year or less and have to prove their success on a single day. There is no requirement to document intermittent second party audits by the herd veterinarian, or buyer.

Improve Animal Welfare

It is the opinion of this author that only one program exists that fits this motivation. This is partly due to the fact that developing an animal welfare program and audit that actually aims to improve animal welfare is the most challenging task. Doing so requires that the program requires continual attention to animal welfare on an ongoing basis rather than during an annual or biannual exam. The program's standards and the audit tool should be developed by independent academics with specific expertise in animal welfare for the species of interest while allowing for the input of all stakeholders to ensure that it meets the expectations of the supply chain, the consumer and can actually be achieved by the farmer. Programs such as this require that expectations are high and that standards are set by using data when available that demonstrates what well managed farms are able to achieve.

The only example of success is at the packer level - The pork and beef industries have achieved this at the slaughter house with the institutionalization of the American Meat Institute's (AMI's) animal welfare audit for slaughter. Today, nearly every major meat packer executes internal audits of their animal handling practices throughout the year and is subject to both 3rd party audits and audits of their customers. Internal as well as 3rd party audits identify problem areas and require a corrective action plan (CAP) be implemented. To ensure improvement documentation of the execution of CAP's are required. Complete transparency is also allowed by 3rd party auditing reports being shared at the plant level. This approach has proven to work at mitigating risk and improving welfare not only in the data provided by the audits, but it is seen in the fact that the focus of special interest groups has moved from the processing plant to the farm. The fact is, since audits have been implemented, we have seen significant and dramatic improvement in animal handling at slaughter as documented by Temple Grandin. This approach has been successful simply because compliance was mandated throughout supply chain which minimized the effect of simply pushing farms out of sight. Additionally, both second and third party auditors for the AMI audit are trained and certified through an independent organization that require in depth training and recertification on an annual basis.

So while the rest of animal agriculture continues to sort out which approach they will implement, the reality is that every farm will have to undergo some process in which the care and welfare of animals on their farm is evaluated. The outcomes of the process remain to be seen and will only serve to promote and protect the welfare of animals if accountability is embraced and required. Until such an approach is taken, will it be possible for an industry to coalesce around a single program. In the meantime, confusion and chaos will remain in this sector of the market and continue to serve as an Achilles' heal for special interest groups to attack and savvy marketers to take advantage of.

References

Jamison, W. 2010:
Current consumer perceptions of animal agriculture. NMC presentation. Albuquerque, NM.

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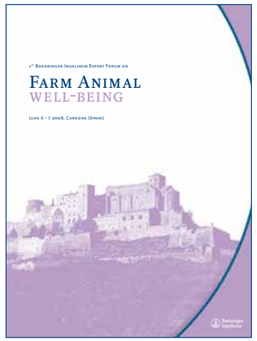

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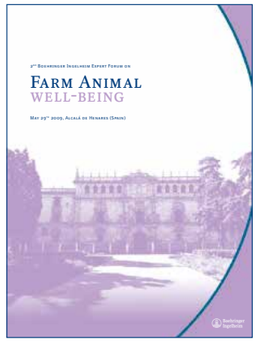

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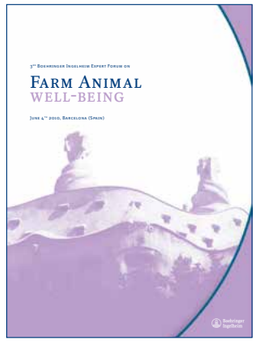

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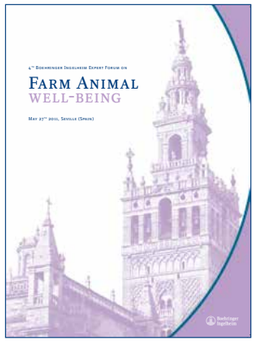

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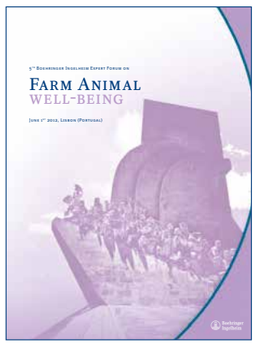

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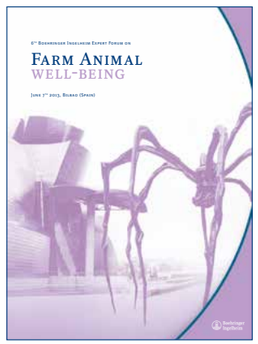

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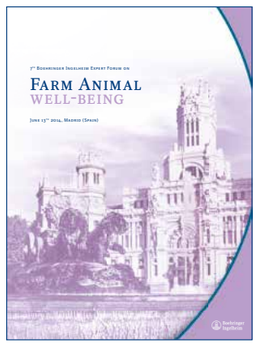

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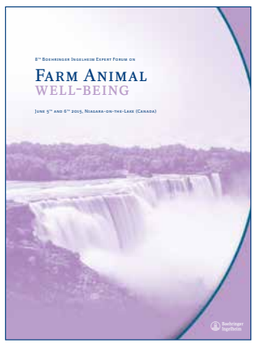

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Reference 1. McDougall *et al.* 2016 Addition of meloxicam to the treatment of clinical mastitis improves subsequent reproductive performance. J. Dairy Sci. 99:1–17. Metacam® is a trademark of Boehringer Ingelheim Vetmedica GmbH, 55216 Ingelheim am Rhein, Germany. Further information available from Boehringer Ingelheim.