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A decade of farm animal **well-being**



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FARM ANIMAL WELL- BEING

Science shows that when farm animals are not just healthy, but also free of pain and discomfort, there are far-reaching positive consequences.

At Boehringer Ingelheim, we believe that vets play a key role in promoting better farming practices. Our aim is to build and share scientific knowledge around farm animal well-being, where effective pain management benefits livestock and rewards farmers, while satisfying the social demands for responsible farming.



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well-being **works.**



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Boehringer Ingelheim Animal Health GmbH

Binger Strasse 173

55216 Ingelheim am Rhein/ Germany

www.boehringer-ingelheim.com

Contact:

Elke Abbeloos - Global Marketing Cattle

Phone: +49 6132 77-143837

Email: elke.abbeloos@boehringer-ingelheim.com

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Prof. Jon Huxley
University of Nottingham, UK

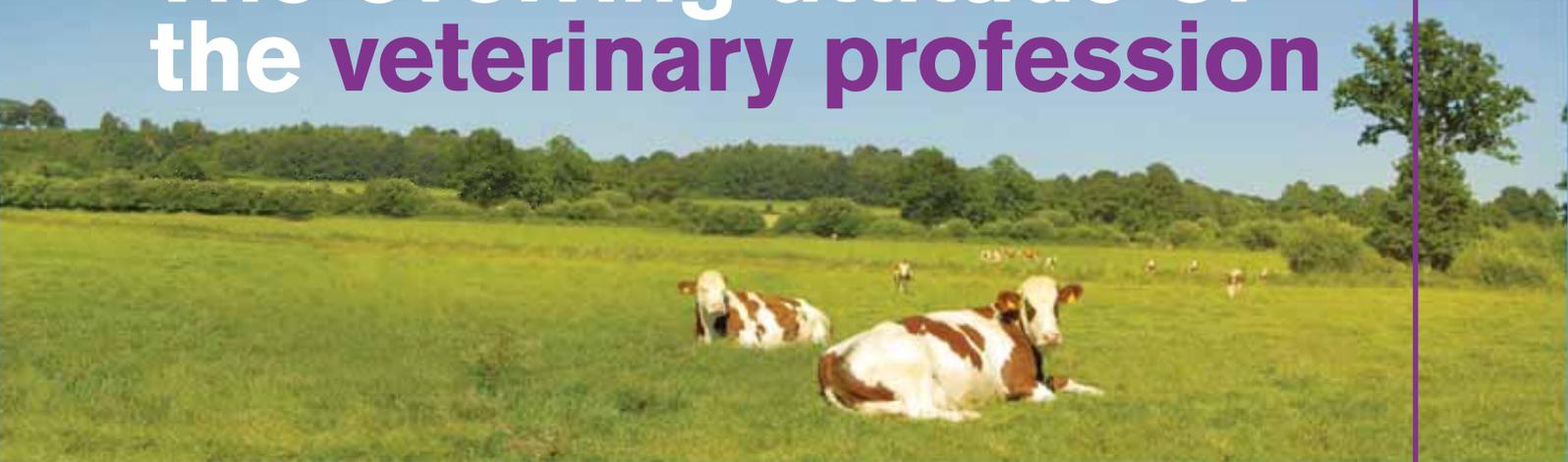
Jon Huxley was raised on the family dairy farm in North Wales and graduated from the Royal Veterinary College, London in 1995. After four years in farm animal practice, he completed a PhD on bovine mastitis at the University of Bristol. He remained at Bristol as a Lecturer until 2006 when he became a foundation staff member at the University of Nottingham's new Veterinary School.

Jon is a research clinician specializing in the endemic diseases of dairy cows, particularly lameness and mastitis, and the impacts of production and the housed environment on dairy cow health and well-being. He is a UK and European clinical specialist in his subject and has been named on over £7.5 million of research funding since 2006. He is currently Professor of Cattle Health and Production and co-leads the Dairy Herd Health Group working at Nottingham. The group has approximately 25 clinical and research members and prides itself in delivering world class solutions for a sustainable dairy industry.

Prof. Jon Huxley

University of Nottingham, UK

The evolving attitude of the **veterinary profession**



It is over a decade since the first studies to explore the opinions of vets and farmers to pain in cattle and the provision of analgesia were published. In the intervening period, we have seen an explosion in work, from all over the world, which has allowed us to explore the amalgamated attitudes of a range of industry stakeholders. Some of the key and consistent findings from the work with veterinarians can be summarised into the following five points:

1. Pain scores attributed by vets for the same condition or procedure vary:

when asked to estimate pain score (e.g. on a 1 – 10 scale) there is considerable variation between respondents when considering the same condition i.e. whilst median scores can be used to describe the average opinion, there is often little consensus even amongst apparently homogenous groups e.g. cattle vets.

2. Pain score is significantly associated with the likelihood of analgesic administration (with one caveat - see Point 5 below):

one of the motivators for the use of analgesics

is, perhaps unsurprisingly, the clinician's own perception of the animal's suffering. Therefore (and coupled with point 1), one of the barriers to the provision of appropriate analgesia in some cases, may be an unwillingness or inability to appreciate the level of pain that cattle are likely to be suffering.

3. There is a difference in allocated pain scores between the genders:

broadly speaking female veterinarians score pain in cattle more highly. In our most recent study analysed using a multivariable statistical approach this was approximately half a score higher (on a 1 – 10 scale) than their male counterparts.

4. There is a difference in pain scores allocated by veterinarians graduating in different decades:

after removing the effect of the difference between genders (to account for the much higher proportion of female veterinarians who have been graduating more recently), young veterinarians score pain in cattle more highly than their senior colleagues, for most procedures and conditions.



5. There is a difference in the levels of analgesia administered to calves compared to adult cattle:

despite being scored with a similar pain severity to conditions in adults, calves undergoing routine procedures appear less likely to receive analgesia.

Undoubtedly attitudes are evolving and whilst of course cost remains an issue for many producers, the use of analgesia in cattle, and other farm species, is increasing. For example, between 2008 and 2015 the total UK market value of non-steroidal anti-inflammatory drugs (NSAIDs) sold for use in cattle increased from £4.74M to £10.56M and year on year the rate of increase is continuing. It is difficult to quantify the exact number of individual animals that have benefited directly from improved pain management, but we estimate that in 2015 between one and two million additional animal doses were administered in the UK compared to 2008. Promoting change has required concerted coordination and collaboration across the sector (e.g. vets, producers, pharmaceutical companies, academia and others) and has largely focused on identifying barriers to usage and promoting open and honest discussion amongst vets and farmers. Our experience would suggest that often the process of identifying the differences in opinion and in analgesia administration practices that exist, and highlighting areas where individual clinicians are out of step with their peers, is enough to promote change in prescribing habits.

Whilst the changes of the last decade are clearly encouraging, we have identified a number of significant barrier to further improvement, these include:

1. Industry culture, farm protocols and established practice norms. Even if today's graduates have different opinions, it can be very difficult for them to influence the existing

attitudes and analgesia protocols which are currently being delivered on-farm. After graduation, most young veterinarians join veterinary practices (and a cattle industry) which utilise a wide range of existing and often long standing treatment protocols, which conform to accepted norms seated within an established industry culture. These norms are based on the values and opinions of their more senior veterinary colleagues and can be particularly entrenched for ubiquitous and widely practiced procedures such as disbudding and castration. As these senior colleagues are more likely to be both male and older, their views can be divergent with those of young graduates. However, established norms can be extremely resistant to change and challenging the status quo can be met with resistance and in some cases anger and ridicule. Consequently many young graduates feel directly or indirectly pressured to conform with established way of working even if these practices are out of step with their own views.

2. Calves vs adult cattle. There is evidence to suggest that the provision of analgesia to calves may be considered less important than it is for adult cattle. This is especially concerning given that most of the routine painful procedures conducted on cattle, such as disbudding and castration, are carried out when animals are young.

Historically, the same was also the case in human medicine where babies and young children were provided with suboptimal levels of analgesia because they were considered less sensitive to pain. Whilst paediatricians have worked hard to dispel this myth (there is no evidence to suggest that pain is less intense in babies and children), it appears that the same misunderstanding may also be prevalent in veterinary medicine.



3. Outdated legislation. In many countries animal health and welfare legislation in this area can be very dated (e.g. over 50 years old in the UK) and like all legislation can be difficult and time consuming to change. Consequently legislation often lags behind the changes in scientific understanding, societal opinion and available pharmaceuticals which have taken place since it was formulated. As legislation is often seen as the ultimate arbiter of acceptable practice by many stakeholders, it can be used to defend and legitimise protocols which many would find outdated and even unacceptable.

4. “Antibiotics” vs “Anti-inflammatories” Informal feedback from producers suggests that there may be two challenges with terminology in this area (at least in English – the same may not be true in other languages). Firstly “NSAIDs”, “non-steroidals” and “anti-inflammatories” are more medical terms which can confuse and alienate producers. “Pain killer” is a more widely understood and user friendly term accepting that it is imprecise and doesn’t acknowledge the other important pharmacological actions of this group of drugs. Secondly the drive to rationalise antibiotic administration in food animals, because of the concerns over antimicrobial resistance, appears to be leading to fear and confusion amongst some producers over *all* injectable products. This is particularly the case for NSAIDs because of the incorrectly perceived similarities / associations between “*anti-biotics*” and “*anti-inflammatories*”. It is imperative that the drive to reduce, refine and replace antibiotic usage does not lead to a rebound reduction in anti-inflammatory administration.

doing so have helped to identify some of the key areas of concern / barriers to future improvement. It is incumbent on all of us with an interest in this area to be the champions of change, promoting appropriate analgesia to optimise the health and well-being of the farmed animals entrusted to our care.

Acknowledgements

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What will the future hold? The rapid expansion of studies published in this area from around the world have undoubtedly helped to shine a light on this little understood area, and in



Prof. Suzanne Millman

Iowa State University, USA

Dr. Suzanne Millman joined the faculty of the Iowa State University College of Veterinary Medicine in 2008, as Associate Professor of Animal Welfare. She holds joint appointments in the Veterinary Diagnostic & Production Animal Medicine and Biomedical Sciences departments.

Dr. Millman is an applied ethologist, whose research interests include animal welfare assessment, pain and sickness behaviour, and practical solutions to address farmed animal production environments. Dr. Millman coordinates animal welfare instruction within the veterinary professional curriculum and provides professional outreach service in animal behaviour and welfare for producers, veterinarians and the public. Millman serves as Section Editor (Farmed Animals) for the Journal of Applied Animal Welfare Science, co-Chair of the AVMA Model Animal Welfare Curriculum Planning Group, and Invited Expert on the OIE Ad Hoc Group on Animal Welfare and Chicken Layer Production Systems. Dr. Millman serves as an animal welfare expert for HyLine International, U.S. United Egg Producers, Iowa Pork Producers Association, Humane Farm Animal Care and several retailer and restaurant companies.



Prof. Suzanne Millman

Iowa State University, USA

Assessing pain now and then

The International Association for the Study of Pain defines pain as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage” (IASP, 1979). Since the 1800s, animal models have been used in biomedical research exploring neurophysiological mechanisms of pain. However, research designed to understand how animals experience pain and opportunities for pain management in veterinary medicine are relatively recent and reflect public concerns for animal welfare (Zimmerman, 1986; NRC, 2009).

Pain is a multidimensional perceptual experience, involving sensory and affective components (for review, Millman & Coetzee, 2014). Sensory information is communicated from nociceptors at the tissue level, and modulated through spinal and supraspinal mechanisms. This information is further integrated into sensory and emotional components in the brain, resulting in varied responses according to species, ontogeny and type of insult. For clinical trials involving human patients, Initiative on Methods, Measurement and Pain Assessment in Clinical Trials (IMMPACT) guidelines propose measuring pain treatment outcomes across multiple domains, including

pain sensation, physical function, emotional function, global improvement, symptoms and adverse events (Dworkin et al., 2005). Similarly, Gregory et al. (2013) proposes animal clinical trials should include outcomes associated with unique constructs of resting pain, movement pain, hyperalgesia, function and quality of life. Pain can impact all of these simultaneously, and hence blurring of these constructs within subjective pain scoring systems often results in poor sensitivity and specificity, particularly when it is unclear which construct is the driving factor of the evaluation.

Responses to pain can be identified by titrating against a control population that is not experiencing pain, against the animal itself prior to the pain intervention and/or against responses when analgesia is present. Routine surgeries, such as castration, tail docking and dehorning, have provided opportunities to explore acute pain responses of livestock with immediate practical applications. Naturally occurring and induced lameness models have also provided opportunity to validate clinical pain assessment tools, such as gait scoring, kinematics, weight bearing technologies and nociceptive thresholds.



Measuring pain using spontaneous responses

Physiological stress typically accompanies pain, and changes in hypothalamic-pituitary-adrenal (HPA) axis provide useful quantitative outcomes for diagnosing and treatment pain. For example, elevated plasma cortisol concentrations are observed following bovine dehorning (Stafford et al., 2003) and castration (Stafford et al., 2002) surgeries, and are attenuated with local anaesthesia and non-steroidal anti-inflammatory drugs (NSAID) for acute and post-surgical analgesia, respectively. Similarly, rapid changes in the sympathetic branch of the autonomic nervous system (ANS) occur, and can be measured using plasma catecholamine concentrations, heart rate variability and pupil dilation (Stewart et al., 2010). Changes in eye temperature are observed in response to disbudding surgery, and these changes have been found to attenuate with NSAIDs in some studies (Stewart et al., 2009), but not others (Glynn et al., 2013; Stock et al., 2015; Stock et al., 2016).

Behaviour responses can also be objectively quantified, through the use of an ethogram with definitions of behaviours to be measured according to frequency, latency and duration of response. Whereas some studies find poor correlation between behavioural and physiological outcomes (Mellor et al., 2000; Urban et al., 2011), other researchers have identified characteristic nocifensive behavioural indicators associated with specific pain states (Kent & Molony, 2008). For example, disbudding pain is associated with increased frequency in ear flicking and head-related behaviours, which emerge after loss of local anaesthesia and attenuate with an NSAID (Faulkner & Weary, 2000; Heinrich et al., 2010). Conversely, statue standing and reduced activity is expected after castration (Kent & Molony, 2008). Hence, a critical aspect of experimental design in behaviour research is identification of a priori hypotheses and

expected effects on outcomes measured, together with appropriate sample size calculations (O'Connor et al., 2014; O'Connor et al., 2016).

Measuring pain using evoked responses

Reflexive responses to noxious stimuli have been used to quantify nociceptive thresholds in biomedical animal models of pain, and subsequent efficacy of analgesic interventions. These experimental findings have proven consistent with human verbal communication of pain levels and analgesia (Gregory et al., 2013). Reflexive pain tests use heat, cold, mechanical and electrical stimuli, and activate nociceptors at the site of testing, triggering local, stereotypical motor responses. These motor responses do not require supraspinal activation or conscious awareness, but are modified by these where present. When applied at the injury site, change in threshold for response reflects primary hyperalgesia associated with sensitization of nociceptive primary afferents. When applied outside injury site or in absence of injury, changes in threshold reflect secondary hyperalgesia relating to sensitization of neurons in the spinal cord or central nervous system (CNS). Secondary zones of hyperalgesia tend to spread from the original injury site over time.

Mechanical nociception thresholds around the horn bud decrease following disbudding surgery in calves, and this response is attenuated with local anaesthesia and NSAIDs (Heinrich et al., 2010; Stock et al., 2015; Stock et al., 2016). Similarly, when lameness is induced in sows, decreased mechanical nociception thresholds are observed in the lame but not sound limb (Tapper et al., 2013), and this effect is attenuated with an NSAID (Parris-Garcia et al., 2014). Sensitivity of nociception threshold tests may be refined with techniques that include restraint (Figure 1). Furthermore, the social environment may be important since a bystander effect has been reported in the



rodent literature, such that control animals housed or tested in the presence of conspecifics receiving a persistent noxious stimulus display hyperalgesia in response to mechanical, thermal and chemical nociceptive threshold tests (Smith et al., 2016). Effects of the social environment on livestock pain responses are unknown.

place avoidance involves placing the animal in an environment with two distinct chambers or pens. Animals are trained to associate one of the locations with a painful event, such as disbudding, whereas the other location is neutral. The relative unpleasantness of the pain experience can be evaluated by quantifying the animal's subsequent

avoidance of the conditioned location relative to the neutral location, using metrics such as time spent in the location or effort expended to escape from it. Similarly, for animals experiencing chronic pain conditions such as lameness, there is opportunity to utilize conditioned preferences for positive associations when analgesia when it is paired with a particular location or resource.

Practical considerations and implications

In conclusion, opportunities to evaluate animal pain continue to develop and refine in the laboratory for biomedical, veterinary and animal welfare purposes. New knowledge,

particularly with respect to neurophysiology and cognition, provide opportunities for refinements to improve sensitivity and specificity of pain tests, including "asking" animals about the affective components of the pain experience. Furthermore, greater understanding of cognitive effects of pain can strengthen design and management of treatment protocols and hospital pens to facilitate convalescence. Whereas cost, equipment and labour limit the application of some techniques for field conditions, others may translate nicely into on-farm data collection systems and veterinary practice.



Figure 1. A head restraint device used to facilitate nociception threshold testing of calves following cautery disbudding. (Image courtesy of Dr. S. Millman)

Measures using cognitive approaches

To truly understand the pain in animals, one must utilize techniques that reflect affective states and the animal's subjective experience. Cognitive approaches provide opportunity to "ask" animals about their pain experiences, applying associative learning and titrating responses against known positive or neutral conditions (Gregory et al., 2013). For example, conditioned



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Prof. Dan Weary

University of British Columbia, Canada

Dan Weary is a Professor at The University of British Columbia. In 1997 Dan co-founded UBC's Animal Welfare Program and co-directs this active research group. Before coming to UBC he worked as a Research Scientist with Agriculture and Agri-Food Canada in Ottawa. Dan did a B.Sc. and M.Sc. in Biology at McGill University, his doctorate in Zoology at Oxford University and was a post-doctoral fellow at Queen's and Concordia Universities. Dan's research focuses on developing behavioural measures for the objective assessment of animal welfare and developing practical methods of improving the welfare of animals.

Dan's work on dairy cattle focuses on the housing and management of dairy calves and cows. His work has helped lead to the changes in feeding practices (including the adoption of higher milk rations) and housing methods (including the adoption of pair and small group rearing for pre-weaned calves). Work on cows has focused on improved comfort (especially in stall design and management), and how these changes can benefit cow health (especially lameness). Dan's experimental work is based at the UBC's state-of-the-art Dairy Education and Research Centre, located in the heart of the BC dairy industry in Agassiz, BC. Much of Dan's recent work also takes place on commercial farms, helping to ground results in commercial practice, and acting as a direct conduit for knowledge sharing between researchers and innovative dairy producers.

Dan has authored 100's of publications and is a frequent speaker for dairy and professional audiences.



Prof. Dan Weary

University of British Columbia, Canada

The scientific assessment of pain and suffering in animals

Finding out what animals *feel* is both of immense practical significance (this question is at the heart of many animal welfare issues), and is one of the most difficult scientific challenges in modern biology. In the first part of my presentation I will critically examine inferences regarding pain in animals based upon various types of experimental and observational evidence. I review three types of approach: the assessment of spontaneous response to a noxious stimulus, changes in these responses following a drug treatment, and assessments of the animal's motivation to avoid the stimulus. In each case I provide examples from previous experiments, and suggest refinements that overcome certain limitations to each approach. I conclude this section by suggesting that studies using learned, flexible, context dependent responses and tasks involving discrimination and generalization of affective states induced by drugs may be especially useful (Weary et al., 2017).

In the second part of my presentation I attempt to develop a framework for the scientific study of animal suffering. I suggest that it is important to address the issue of suffering explicitly, as many laws (e.g. "Causing unnecessary suffering" section 445.1 of the Criminal Code of Canada) and much of the rhetoric associated with animal

welfare revolves around this term. Current usage of the word 'suffering' in the scientific literature implies simply that the animal is aware of the pain (e.g. Chandroo et al., 2004), or that the pain is severe or prolonged (e.g. Dawkins, 1980), but this usage does not correspond well with how human patients distinguish pain from suffering. Research on quality of life in humans illustrates that assessments of our own well-being are only partially related to what we have. Our sense of agency (how we gain access to the things we value, including our ability to learn about different outcomes and to make informed choices) is also critical (Higgins, 2012). Recent reviews of the animal welfare literature have suggested that such processes are central to nonhuman welfare as well (Franks and Higgins, 2012; Spinka & Wemelsfelder, 2011). I will describe how agency, including the ability to control (e.g. ability to escape threats) and learn about threats (i.e. predictability), may critically affect how pain is experienced by animals. My provocative claim is that, in the absence of control and predictability, pain is more likely to be considered suffering. Research on humans shows that agency is a key determinant of whether patients describe their condition as 'suffering.' In a classic example, Cassell (1982) described one patient who required "small doses

of codeine” for pain when she thought that this pain was due to sciatica, but required much higher doses when she found out that the cause was cancer. Situations that induce uncertainty and loss of control are consistently referenced in studies of human suffering (Cassell, 1999).

Painful procedures are routinely performed on farms with little or no provision of control or predictability. However, animals can be trained using positive reinforcement to freely approach (and, if they wish, retreat from) the painful treatment. This approach is becoming the gold standard in some zoo and primate facilities (see Reinhardt, 2003, for a classic example involving macaques trained to voluntarily present a leg for a blood sample). I argue that providing control and predictability will reduce the pain responses described above, and reduce the likelihood that this pain causes signs of suffering. Suffering is often associated with reports of low mood in human patients (reviewed in Weary, 2014). I will review how low mood can be assessed in animals using a range of approaches including cognitive bias tests, evidence of depression-like forms of inactivity (including learned helplessness and anhedonia; Fureix and Meagher, 2015), and reductions in anticipatory behaviour (Makowska and Weary, 2015).

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Katrine Lecornu

Dairy Farmer, France

Originally from Norway, Katrine has been running a dairy farm together with her husband Richard since 1994. Today, they have 130 cows and 100 hectares of land in Normandy, one of the big dairy regions in France. Additionally to farming, Katrine and Richard “manage” a family of six children from 10 to 24 years.

Katrine has an agricultural degree, after which she completed a master degree in Business Administration at the University of Caen in 2013.

Katrine is strongly convinced that looking across borders is vital to be a good farmer and a forward oriented entrepreneur. Therefore she became an active member of European Dairy Farmers since 2001. For two years, she was president of the French branch and since June 2013 she became the first female president of EDF Europe.



Katrine Lecornu

Dairy Farmer, France

Animal welfare from a farmer's perspective: constraint or opportunity?

Dairy farmers sometimes experience animal welfare as constraints in terms of extra investments, new regulations, external control of our business, or more work. Until recently, communication was in general considered as non-relevant for dairy farmers, because we have very little contact with the final consumers. In a context of lack of transparency and non-communication from farmers, young urban generations disconnected with modern farming and rural life. Spiced with sulfurous scandals spread in the media, "animal welfare" suddenly became a hot topic. Public opinion, NGO's and consumers came with clear expectations about what they see as important issues, whilst many of us did not feel concerned about the discussion.

Can we be dairy farmers without respecting animal welfare?

Welfare means "taking care", and if we farmers don't take care of our animals, we will pay it on the short term (sanitary problems, illness, high vet costs, low feed efficiency, low production, high feed cost, lack of quality, lameness, ...) and also on the long term (high mortality, bad reproduction, low body score, few lactations, less income ...). Good cow management is based on technical skills around the fundamental needs of our cows.

In addition, to be a good herd manager and a successful entrepreneur, we have to combine our savoir-faire with competences in general management of our business. Animal welfare and herd management are part of our complex "farm ecosystem" where new benchmarks are outlined.

Challenges for the future

Herd size is growing, high yields and efficiency are crucial, cows graze less, and automation and smart farming tools represent a revolution of our farm work. At the same time, people want to see cows in the field, they refuse "factory farming", they demand low carbon foot print as well as comfortable bedding and "humane slaughter" for animals.

Better farm practice or better communication?

What is our biggest challenge for the future. Do we really need to change or improve the welfare of the cows or is it just a matter of regaining the confidence from people? Maybe we just need better communication to show that we are the best to take care of them?

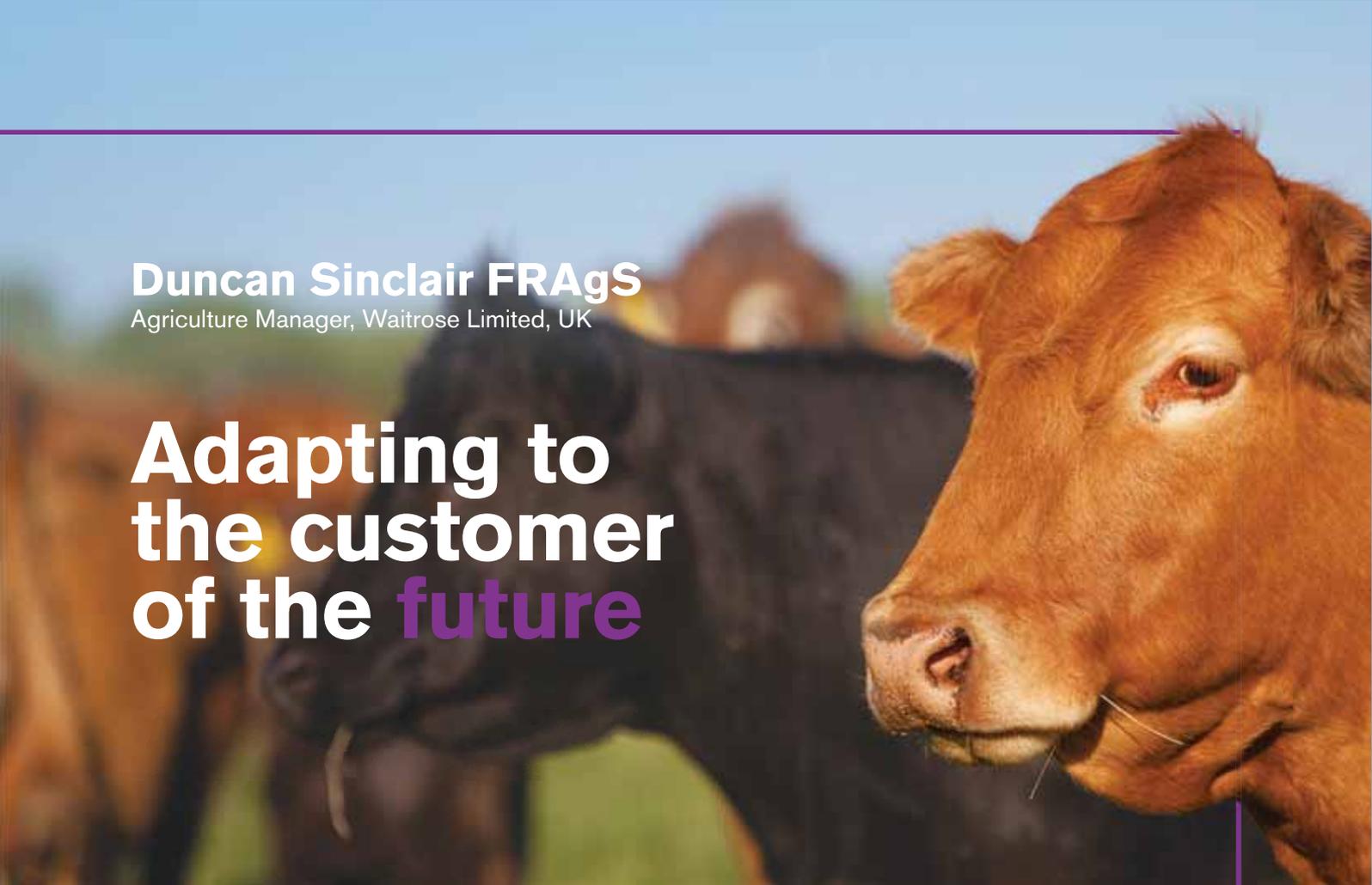


Duncan Sinclair FRAgS

Agriculture Manager, Waitrose Limited, UK

Duncan joined Waitrose in January 2007 as Agriculture Manager covering the Meat, Poultry, Fish and Dairy sectors. He has responsibility for the Waitrose livestock supply chains, which have been established over the last 25 years, and works closely with the processors' and their teams. Delivery of the Waitrose Agricultural Strategy is the framework for focused activity and development of the producer groups moving forward.

In 2013, Duncan was co-opted onto the Farm Animal Welfare Committee to advise on their Beef opinion. Prior to joining Waitrose he spent 17 years at the Meat and Livestock Commission where he was Economics Manager for Beef and Lamb. In 2014 he was made a Fellow of the Royal Agricultural Societies (FRAgS) of the United Kingdom.



Duncan Sinclair FRAgS

Agriculture Manager, Waitrose Limited, UK

Adapting to the customer of the future

While Waitrose may be small in terms of other UK retailers it is fiercely proud of its achievements and accolades and its commitment to higher animal welfare production systems sits high on that list. The building blocks started over 25 years ago when the business developed its network of livestock supply chains extending the sense of partnership not only to its processors, many of whom are dedicated to Waitrose, but also to its supplying farmers.

These relationships have strengthened over the years with long term relationships been a key component of the success as has a commitment to longer term stable pricing. This has provided the supply base with the confidence to invest and develop capacity while still delivering Points of Difference in a very competitive market place and, most importantly trust in the supply chain. Today, across its 30 different livestock supply chains, Waitrose is working with just over 2,000 farms sourcing all of its primary protein direct from farm to processing site.

The unique approach has also extended to the Agriculture teams under the umbrella of the Waitrose Farming Partnership (WFP).

Through the WFP, significant progress has been made at driving the agriculture agenda through working together as a team over the last decade developing Points of Difference; an extensive programme of Knowledge Exchange across all the supply base to drive the ethos of continuous improvement; adoption of performance KPIs including a comprehensive range of welfare outcomes.

Over the last decade the commitment to higher welfare systems has been recognised from leading welfare organisations; Good Chicken, Good Egg, Good Pig and Good Dairy Awards all from Compassion in World Farming plus several most Compassionate Supermarket Awards. In addition Tier 1 status was achieved in 2015 and subsequently retained as part of the Business Benchmarking in Farm Animal Welfare (BBFAW); an annual ethical investment assessment of over 100 leading international businesses.

Our challenge is to communicate all our key points of difference including our commitment to higher animal welfare systems in a very competitive retail environment while still rewarding our most loyal customers.

Adapting to the customer of the future

Last year we made a start to telling that story by developing two key Television ads where the livestock were the heroes; our commitment that the cows in our milk supply chains would graze for a minimum of 100 days during the grazing season and our commitment to only use free range eggs in our shell eggs and food ingredients. Both ads backed up by strong supporting print and media activity in a very open and transparent manner including our farmers who are our strongest advocates.

Our livestock schemes are underpinned by an ethos of continuous improvement and we are continually exploring Research and Development opportunities to generate the next generation of Points of Difference that will be relevant in the future for our customers. We also have a comprehensive range of Responsible Animal Health planning activity underway in response to the challenge of Antimicrobial Resistance with a focus firmly on disease prevention while collating our antibiotic use sector by sector.

Sharing the responsible farming practices that our farmers undertake with our customer base seems the right thing to do. In a society that is increasingly urbanised with less and less connectivity to farming and the countryside, it is a fantastic opportunity for us as a responsible retailer to tell that story in conjunction with our processors and farmers. We already have an eye on the future especially around the evolution of our higher welfare systems and exploring how we can be sure that these are fit for purpose both for the animals as well as delivering commercially for the other members of the value chain.







Daniel Nowland

Jamie Oliver Group, UK

Daniel has a scientific degree in food quality, and is Jamie Oliver's in-house expert on all things food and farming related. Daniel has worked for Jamie Oliver since 2009 and is currently the Head of Technical. He spends much of his time on farms and in factories all over the world, working with Jamie on developing and raising standards. Meat and livestock are Daniel's areas of specialist interest and from where he started his career. Daniel currently manages the Jamie Oliver Food Ethos, with focus on improving animal welfare and sustainability, across a complex global industry. He has built a unique supply chain management system for the Jamie Oliver Group, enabling global management of Jamie's high food standards. Daniel is also a Director of Humane Farm Animal Care, America's leading farm animal welfare certification charity.

A photograph of a brown cow standing in a lush green field. The cow is facing forward and has a white ear tag on its left ear with the number '714' and 'R67 CS' written on it. The background is a soft-focus green field.

Daniel Nowland

Jamie Oliver Group, UK

Well-being meats the foodies

Food now seems to be one of the most widely debated topics in the developing world. Our booming social media is awash with articles, images and video, igniting heated debates on what “responsible” looks like in modern day food. Our food choices can define us, create labels for us, and even affect our social circles. The same is now true of food businesses, and the choices made by large industry players can change our global systems, for better or for worse.

The chance to vote

We are fortunate that in the developed world, access to food is rarely an issue. That is not to say we are accessing the right sorts of food, or eating them in the right quantity. However, most have the option to select foods based on their preferences, values and affordability. We have the opportunity to “vote” for food systems, three times a day, with every meal we consume.

The modern day supermarket is the ultimate ballot box. We have more choice in the meat aisles than ever before, with most retailers offering a range of options to choose from. Usually, as the ethical or quality credentials of the meat product increases, so does the price. Despite this, more of us than ever are selecting foods with more

“ethical” credentials. (source: ONS 2014)

So what happens when we do not get choice, such as in our favourite restaurant chain, or our favourite brand of frozen pizza? Should the consumer accept what they're given, and can the consumer trust the brand to make the right choices for them?

Animals in our food chains

Our acceptance of eating animals is a topic which can divide, in a similar way to religion, politics, or social class. Approximately 95% of Europeans and 97% of Americans eat meat, and even more consume other animals' products such as milk, cheese and eggs.

For any business or brand directly implicated in animal products, it will usually be the most contentious of all business activities. In one way or another, these industries rely on the breeding and slaughtering of sentient beings, which have no choice as to their fate. With this in mind, how should companies behave, in order to be seen as “responsible” when engaging in these activities?

For some people, there is no “right” way to produce an animal product, but for the

majority of the population who accept animal products as food, it's often more about "where to draw the line". Legislation around animal welfare varies, depending on where in the world you are, and it can be complex at best. Therefore, business is better placed to effect it, rather than relying on governing laws.

Animal welfare and the brand

As our inquisitive nature, awareness of animal welfare, and access to information continues to grow, brands are now facing new challenges in keeping consumers on side, and winning against competitors. A trawl through corporate social responsibility reports will show that animal welfare is now one of the top ethical concerns for many food businesses, along with slave labour, environmental impact and fair trading. It is now regularly used as a "proof" of brand equity. The recent commitments of companies to abandon cage-free eggs has spread around the globe like wildfire. Meanwhile, supermarkets around the world compete on animal welfare commitments to show their consumers that they care as much, if not more, than their competitors.

It's not just consumers who are taking an interest though. The annual Business Benchmark on

Animal Farm Welfare (BBFAW) compares company's policies and communications on animal welfare as a means of influencing investors. Why? Because when animal welfare goes wrong, the consequences for the business involved can be financially disastrous.

How is change effected?

There are two main causes for positive change to animal welfare; enforced change through legislation, or voluntary change to meet consumers' demands or expectations.

Jamie Oliver, the world's most famous chef, and activist for positive change, has been a driving force in many aspects of the food industry throughout his 18-year role in the public eye. Jamie and his senior team quickly realised that they could affect meaningful change much quicker by partnering with sectors of the food industry, rather than battling against it, or waiting for governments to make changes to law.

If animal welfare is affected by both supply and demand of animal products, Jamie likes to work on both. His media channels, including TV, books, digital assets and magazines, all discuss animal welfare in an informative way to help consumers



understand the topic, and empower them to make informed choices. Jamie's TV studio programmes, *Jamie's Fowl Dinners* (2008) and *Jamie Oliver Saves Our Bacon* (2009) created lasting change in sales of higher-welfare meats and eggs, and also directly improved the carcass balance by encouraging people to switch to cheaper, lesser known cuts, and spend the saving on buying better.

At the same time, Jamie partners with major food businesses including manufacturers and supermarkets, where Jamie's power of consumer engagement is exchanged for a seat at the table on issues around animal welfare, as well as other ethical issues, such as nutrition and sustainability. Some of the most notable examples of this have been his partnering with Australian supermarket Woolworths, where his influence helped drive commitments on animal welfare issues in all major proteins.

More recently, Jamie's partnership with Brazilian food brand Sadia, has created a new tier of certified higher-welfare products, helping Brazilian people to trade up to a higher-welfare option for their most loved protein; chicken. In the first year alone, around 40 million chickens have had an upgrade of production facility from conventional to scientifically verified higher-welfare standard.

Jamie has proven that big business is willing to make positive changes to welfare, particularly when his trusted voice can help consumers come on a journey with them.

Looking forward

It is safe to assume that animal welfare as an ethical issue will continue to evolve. As the world's appetite for affordable protein continues to grow, so will the scepticism of what happens behind closed doors. Therefore, it is within the interests of all parts of the food industry to be honest, transparent and progressive when trading in products of an animal origin. This will allow conscious consumers to navigate the hearsay, and make well-informed, confident choices when buying meat, poultry, eggs or dairy.



Prof. David Fraser

University of British Columbia, Canada

David Fraser has maintained a strong interest in animals throughout his 45-year career of research and teaching in animal welfare and applied animal behaviour. After finishing a PhD in Zoology (Glasgow), he worked at the Edinburgh School for Agriculture on the behaviour and welfare of pigs. He then spent several years in wildlife research and established the role of highway de-icing salt in road accidents involving moose. In the 1980s and 90s he led a team of researchers dealing with the welfare of farm animals. Since 1997 he has been Professor in the internationally respected Animal Welfare Program of the University of British Columbia in Vancouver. His conceptual work has helped define current scientific approaches to the study of animal welfare. He has served as a scientific advisor to many organizations including the World Organisation for Animal Health (Paris), the Food and Agriculture Organization of the United Nations (Rome), and the Food Marketing Institute (Washington). In 2015 he was appointed to the Order of Canada for his work as a pioneer in the application of science to animal welfare.



Prof. David Fraser

University of British Columbia, Canada

Animal welfare: the all-important human dimension

Animal welfare standards have typically emphasized “inputs” such as space allowance, ventilation, access to food and water, and an established herd health program. However, a large body of research now shows that when we compare welfare outcomes on different farms – often using simple metrics such as lameness and body lesions – we invariably find that outcomes range from very good to very poor within the same kind of environment or even among farms that are following the same animal welfare standards. This almost certainly reflects the crucial “human dimension” whereby animal welfare depends strongly on the people involved, not just the environment and other provisions.

What are the elements of this “human dimension” of animal welfare? A combination of research and practical experience suggests the following:

- First is the knowledge, dedication and consistency of the managers and staff. Good animal managers know what to watch for, they know what to do when there are signs of trouble, and they do this consistently.
- Second is skilful handling. Handling that is rough, inexperienced or inconsistent can cause injuries and create a state of

fear in the animals that leads to stress responses and reduced performance.

- Third is a positive attitude toward animals. People who enjoy animals are more likely to pay close attention to them and handle them in appropriate ways.
- Fourth, where herd size permits, treating animals as individuals can also help. If staff know animals individually, they can spot signs of illness early and handle animals according to their individual personality.

When we incorporate the human dimension into animal welfare, we start to see welfare as a complex outcome of the animals, the people and the environment. If these three elements are not in harmony, then animal welfare can break down. Problems can arise if the animals are not suited, because of their genetics or how they were raised, to the kind of environment where they live, or if the environment causes people to handle animals in aversive ways, or if it discourages people from spending time with the animals. On good farms, we see a kind of harmony between the environment, the animals and the people, creating a positive “culture of animal care”.

Animal welfare: the all-important human dimension

Paying attention to the human dimension, specifically human welfare, is also important when we see breakdowns in animal care. Studies of animal neglect and other ill treatment show that the root problem is often mental and/or physical deterioration caused by age, infirmity, or depression, sometimes linked to financial and family difficulties. Hence, interventions for animal welfare need to be linked to interventions for human welfare in order to be effective.

With all the attention now being directed at animal welfare, why has the human dimension received so little? I think the answer lies in a mistaken public perception. Over the past half century, the public has tended to view animal production as having shifted from an agricultural to an “industrial” activity and the public response has been to demand standards or regulations for the animals’ environment, much as factories were regulated in the 1800s to protect the health and welfare of workers. Although this approach can help, it tends to miss the human dimension of animal welfare. A more promising model of change is provided by the health-care professions. Over the past century, these professions developed ways of ensuring that their members are competent, conscientious and adhere to good performance standards, and the result has been a major improvement in both patient care and public trust in health care professionals.

At this point in history, it may sound futuristic to speak of animal production functioning like a self-regulating profession. However, there is great scope for producers themselves, with the support of their veterinary partners, to take the lead in setting and ensuring adherence to standards for animal care along with food safety and environmental protection. This could move animal production much closer to a professional model. It could also help to maintain or restore public confidence in animal producers, and give producers the satisfaction of being leaders in the process of change. Finally, based on the research showing that very different welfare outcomes occur in similar environments, this emphasis on the human dimension might well be the most powerful way to ensure good animal welfare.







Dr. Mike Siemens

Arrowsight Global Agribusiness, USA

Dr. Siemens was raised on a farming operation in Northern Indiana, USA. He obtained his master and PhD in Ruminant Nutrition from the University of Missouri. After a short time as nutrition consultant, he re-joined academia with the University of Wisconsin as their State Beef Cattle Specialist. Following his 10 years in Wisconsin he took a position with Smithfield Foods Inc. where he was responsible for animal welfare oversight. In 2006 Dr. Siemens joined Cargill, where he took on several positions. As Global Leader - Animal Welfare and Husbandry he oversaw all animal welfare efforts for the global Cargill meat business. In this position he started to work closely together with Arrowsight Inc., a company that specialises in remote video auditing and other automatised solutions that can help to monitor and improve welfare. Recently he switched to working for Arrowsight, helping major food companies like Cargill to help them enhance their efforts in the areas of animal welfare, worker safety and food safety.

Dr. Siemens is or has been a member of organisations like the Animal Welfare Committees for the National Cattlemen's Beef Association and the North American Meat Institute where he was the committee chairman from 2004-2006. He is a co-founder of the North American Food Animal Welfare Network and currently holds an Adjunct Faculty appointment in the Department of Clinical Sciences at Kansas State University. Dr. Siemens is also a recognised expert in Canada, where he has been a member of several committees like the Canadian Roundtable for Sustainable Beef and the NFACC Beef Codes of Practice Development Committee.

Dr. Siemens is married to his wife Dr. Angie Siemens, Cargill Vice President – Food Safety, Quality and Regulatory. They have one son Nicholas (age 15) who pretty much takes care of whatever free time there may be.



Dr. Mike Siemens

Arrowsight Global Agribusiness, USA

Building up an open dialogue between industry stakeholders

Strong leadership, ethically grounded, scientifically based commitment to sustained improvement and transparency is what is required to find common ground and have the ability to conduct meaningful engagement with all stakeholders of the food animal industry.

Top level leadership commitment

We've seen some high profile ethical failures in the media in recent years. Numerous undercover videos continue to show that some segments of the food animal supply chain still choose to do the wrong thing. What we rarely see, however, are stories about the numerous companies that are managed by ethical leadership. While standards seem to keep falling in some corporations, other companies "raise the bar" and inspire their teams to do the same. These companies do the right thing, at the right time, for the right reasons. They put their ethics before the bottom line – and, as a result, they have dedicated teams that ensure those values are carried out at all levels of the company.

Incorporating an animal welfare ethos into company policy used to be a huge problem but that has changed radically over the last few years. It is now central to the behaviour of many large food manufacturers and retailers. This is partly a consequence of a growth of corporate social responsibility and sustainability. Large food companies like Cargill have an obligation to ensure that animal welfare is a cornerstone of their sustainability efforts and help all stakeholders in the food animal supply chain improve on their animal welfare programs and policies. It is also imperative that food companies recognize the pride that many farmers take in looking after their animals – and through their relationships with farmers – companies like Cargill play a significant part in supporting farmers by giving them the tools, the long-term investment and the education/ training to ensure a continual and sustained improvement for farm animal welfare. Animal welfare is also very important to consumers and they recognize the relationship between animal health & welfare and food safety. However, they want to be able to rely on food manufacturers and retailers to guarantee that the meat and dairy products that they buy has come from welfare friendly production systems.



Compassion and concern

It is the acknowledgement of these societal concerns that has given rise to a discussion by the food animal supply chain. Certain production practices have garnered much attention. The primary discussion regarding these concerns seemed to be focused on the following specific farm practices: confinement housing, accelerated growth, and painful procedures. Disagreement between producers, consumers and NGO's on these issues is not unusual and quite often the norm. For example, livestock producers recognize certain procedures as painful but consider them either necessary, either sufficiently short-term to be unimportant. They may be of the opinion that pain management presents additional welfare issues which were greater than the pain itself or that pain mitigation options may not currently exist depending on the country they live in. Such differences in attitudes can lead to significant concern in how food animals are raised. These varying attitudes can result in a lack of trust by consumers and industry critics which can have a significant impact on agriculture's social license and the privilege of operating with

minimal formalized restrictions rather than official legislation. As the separation between consumers and producers of food increases in the future, concerns over how food animals are raised and the trustworthiness of food producers and retailers will be a major driver for improving animal welfare. One of the most effective ways to gain consumer's trust is to demonstrate shared values through credible and transparent animal welfare programs.

Proactive leadership efforts & compliance

A company can demonstrate shared values with stakeholders in the food animal supply chain by incorporating scientifically sound animal welfare standards and assessments/audits. Consequently it is important to ensure sustained compliance with those efforts. Back in 2008, Cargill was doing considerable efforts to implement high welfare standards through industry leading training programs, extensive internal animal welfare audit programs and external 3rd party audit evaluations. Yet I was not that confident whether these efforts were truly effective. It was the saying by Mark Twain "It ain't what you don't know that gets you into trouble. It's what you know for sure that just



ain't so." It is with that commitment to a greater understanding of our efforts and to enhanced transparency that we decided to implement the 24/7 independent 3rd party remote video auditing analytic technology of Arrowsight in all of our slaughter plants in North America. This remote video auditing technology has been successfully established to ensure high welfare and sustained compliance in all segments of the supply chain, from on-farm applications, livestock transportation and at slaughter. It is this type of leadership efforts along with other on-farm management decisions that allowed Cargill to become a Tier 2 company on the recent 2016 Business Benchmark Food Animal Welfare (BBFAW) Survey. Cargill along with Nestle were the only companies to be specifically recognized for its leadership efforts at the BBFAW official 2016 announcement in New York City, January 23, 2017.

Conclusions

We must acknowledge that common ground may not always be easily found between certain stakeholders in the food animal industry. There will always be differences in level of knowledge, understanding, concern and motive of almost all participants in this discussion. The discussion can be as complex and different as the people involved. Everyone has a different reference point, from the producer that raises the food animals, the independent academic experts, to the activist that are critics of the food animal industry and everyone in between. Even in those situations it is imperative to maintain a high level of professionalism and transparency so future engagements and dialogue have the ability to be as productive, meaningful and respectful as possible and so future progress can be made for the entire food animal supply chain, especially the animals.



Alison Bard

University of Bristol, UK

How do veterinarians communicate on matters of herd health, and what does this mean for their farmers? As a PhD student at the University of Bristol, Alison is fascinated by this question. Her research aims to provide a detailed picture of the current advisory and communication strategies employed by UK cattle veterinarians in discussions of disease management, and to examine the feasibility of Motivational Interviewing (MI) - a communication methodology used widely in the medical sciences - applied in this context. She is passionate about enhancing the advisory experience for both veterinarians and farmers.

Since the commencement of her studies, Alison has provided training in the MI methodology to myriad professionals in the field of animal health and welfare, from veterinarians and behaviourists to farm assurance inspectors and scientific researchers. Alison also supports undergraduate learning at the University of Bristol, assisting with elective courses and providing lectures on her communication specialism. As a member of the Motivational Interviewing Network of Training, these activities are supported by a wealth of expertise in the theory and practice of MI.

Looking to the future, Alison hopes her research endeavours will help support a paradigm shift in communication on behaviour change within the veterinary profession. With international collaboration already established with the Swedish University of Agricultural Sciences, the support of her funders - the British Veterinary Association Animal Welfare Foundation – and increasing commercial interest in the training she has created, she is confident that this aspiration is off to a promising start.



Alison Bard

University of Bristol, UK

How communication can improve animal well-being

Veterinary communication and change

Being a veterinarian is not just about science and methodology. In the livestock industry, encouraging and motivating clients to improve animal husbandry and adopt veterinary advice remains a critical challenge to improving animal health and welfare. This places veterinary communication at the heart of farm animal well-being; communication is the bridge between veterinarian and farmer that enables the passage of ideas and advice on implementing change, one that can inspire motivation, arouse action and enhance confidence.

Despite this vast potential, communication on farm animal well-being does not always stimulate the change we envisage in response to our ever improving veterinary advice. Over many decades, the scientific quality of advisory recommendations has steadily improved, informed by extensive research into the risk factors and management strategies implicit in disease processes. Veterinary advice is now buttressed by scientific confidence in ways unimaginable to the profession of the past, yet for many animals this has not been sufficient to inspire their caretakers (farmers) to effect change in their management. For

example, little improvement has been seen in the prevalence of lameness in dairy cattle in the UK in decades, despite huge advances in our scientific understanding and advisory capacity (Why and Main, 2010). Why is our communication failing to inspire change, despite such leaps in the quality of the recommendations we make?

The 'right' advice is not (always) enough

When advising, veterinarians instinctively seek to ensure that the scientific quality and accuracy of their recommendations are optimised, and that these recommendations meet practical considerations such as being specific, measurable, achievable and relevant (Sibley, 2006). There is intuitive logic to the conviction that if we can just provide the 'right' choices in our recommendations and facilitate their implementation practically, change should follow. This conviction is entwined with the dominant relationship dynamic established between veterinarian and client: paternalism, where the veterinarian sets the consultation agenda, takes on the role of the guardian and leaves the client playing a passive role (Shaw et al., 2006). This dynamic arises from a desire to help our clients and to fix their problems, but it comes at a cost.



Paternalistic communication tends to be directive in nature, engendering particular communication strategies such as the aforementioned reliance on instrumental support (offering tangible help and solutions), a tendency to rely on closed, fact-finding questions and minimal emphasis on evoking the opinions of the client within an interaction (Bard et al., In press). Despite the intuitive appeal of this style based on assumptions of efficiency (Gray and Moffet, 2010), such persuasive tactics are actually more likely to elicit client reactions against a behaviour rather than in favour of it (a phenomenon known as psychological reactance; Dillard and Shen, 2005). This is due to the ambivalence clients commonly experience in the contemplation of change. This directive approach also offers little opportunity to meet the basic psychological needs necessary for inspiring motivation: autonomy (volition over behaviour), relatedness (to experience connection with another) and competence (perceived self-efficacy; Ryan and Deci, 2000). The predominance of this consultation approach, combined with its conflict with basic motivational principles, may contribute to why low uptake of veterinary recommendations are often reported in a wide range of settings (AAHA, 2003).

A paradigm shift is needed

In the UK, the need to enhance veterinary communication to facilitate better engagement with these motivational attributes has been recognised in our vision of the veterinary profession of the future. The VetFutures project (2015) collates the opinions and experiences of the veterinary profession, alongside veterinary nurses, practice managers and users of veterinary services, and has set core ambitions of areas in which the profession should improve and enhance in the coming decades. To meet the

challenge of creating sustainable businesses and user-focused services, the need to shift from our long-used paternalistic paradigm of communication has been identified:

One of the fundamental drivers underpinning veterinary services may need to change – from a model driven by what vets are prepared to offer, to one that is driven by the needs and wants of existing and potential users of veterinary services.

This may require changing the nature of the discourse between veterinary professionals and clients – from a hierarchical model with the vet as the expert imparting instruction, to one centred on partnership with empowered clients and other veterinary-related professionals.

VetFutures (2015) Taking charge of our future: A vision for the veterinary profession 2030

To successfully encourage and motivate clients to improve animal husbandry and adopt veterinary advice, this paradigm shift is key. A mutualistic, a relationship-centred approach to communication - where client opinions are actively sought and open negotiation leads to a mutually agreed upon plan - will help us better support our clients, better understand their motivations and empower them to engage in change for the benefit of farm animals everywhere.

'The best way to predict the future is to create it'

Professor Peter Drucker

Achieving the ambitions set out as part of VetFutures (2015) is the responsibility of the myriad individuals and organisations working in the veterinary realm. At the University of



Bristol, our research supports and informs this focus on communication, facilitating the shift from paternalism to mutualism. Our work investigating whether Motivational Interviewing (MI), an evidence-based communication methodology developed in the medical sciences, is helping to lay the foundation for *how the vet will communicate in 2027*.

Our investigations on this topic are in the context of cattle health and welfare, with a specific focus on enhancing communication on matters of herd health. This research is being carried out using a mixed-methods approach, to both create a detailed picture of current advisory and communication strategies employed by UK cattle veterinarians and to develop and trial a training intervention for veterinarians using the MI methodology. We are passionate about the potential for MI to not only help veterinarians and their clients in the dairy sector, but in a wide range of veterinarian-client contexts.

Why motivational interviewing?

MI fosters a mutualistic approach as the backbone of practice. It is a collaborative conversation style developed in the medical sciences for strengthening a person's own motivation to change (Miller and Rose, 2009). MI specifically explores and resolves ambivalence to influence the motivational processes that facilitate change by evoking a client's own desires, reasons and willingness to change as a means of clarifying and strengthening their positive intent. Critical to this process is the relational context of empathy, acceptance and partnership, which facilitates the spontaneous emergence of client language of change, combined with technical communication skills that shape and enhance this language (Moyers, 2014).

Empirical studies indicate MI communication outperforms traditional advice-giving in the treatment of a broad range of behavioural problems and diseases, improving client behavioural and medical outcomes (Lundahl et al., 2013; Rubak et al., 2005). Familiarity with this communication philosophy offers novel insights to veterinarians in practice, facilitating the development of a mutualistic consultation style that attends to and enhances the motivational drives of clients.

What will this workshop involve?

This workshop will offer participants the opportunity to gain an understanding of the verbal skills and communication processes that underpin the practice of MI, in addition to the 'spirit' of the methodology that informs its use. This will be achieved through a mix of experiential exercises, group discussions and presentations. Research at the University of Bristol on MI in the context of herd health advice (specifically lameness and mastitis), combined with wider research on human behaviour change and motivation, will support and inform the experience. Participants can expect to take away a better understanding of how to engage clients in conversations about change, combined with ways to practice and learn more about the MI methodology.

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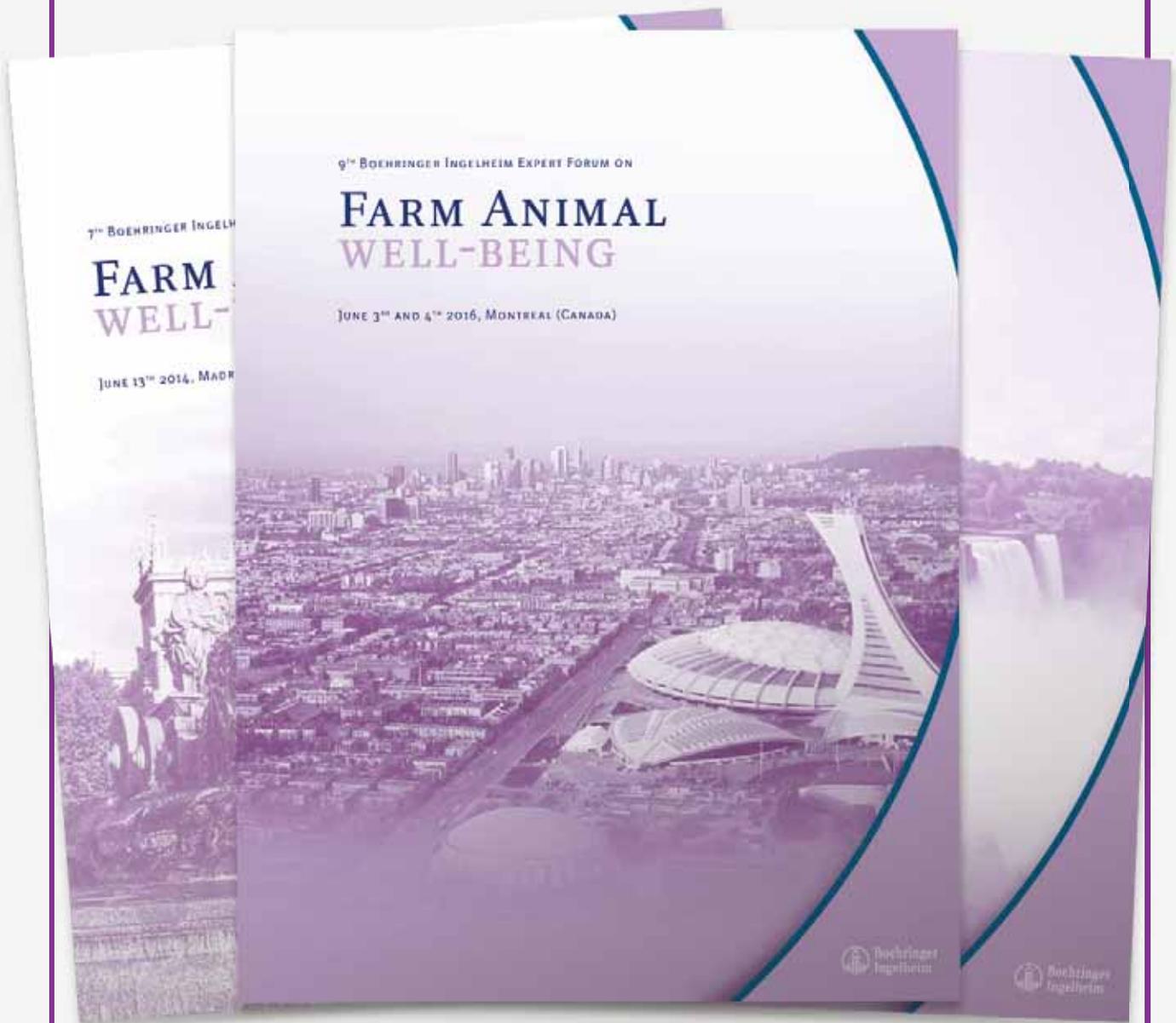
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