

Welfare science into practice: a successful case example of working with industry

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Abstract

Close collaboration between science and industry is essential for the formulation of evidence-based welfare policies. However, there is a need to recognise and manage potential challenges that may arise during collaborative projects. An applied animal welfare science project evaluating the inclusion of welfare outcome measures into UK pig farm assurance, with a view to industry implementation, is used as a case example to illustrate potential challenges. This project encountered difficulties associated with differences in understanding and expectations, discussion of controversial welfare issues, challenges to personal values and conflict between academic and industry outcomes. With the assistance of an independent review conducted during the project, potential solutions were developed and successfully implemented. It is proposed that similar science-industry partnerships should allow sufficient time for dialogue, distinguish between experimental and applied science, ensure sufficient involvement from interested parties and use facilitation techniques to develop consensus.

Keywords: animal welfare, farm assurance, industry, pigs, research, science

Introduction

The relationship between a research team and an industrial partner should be mutually beneficial. Industry usually benefits from the credibility of the research findings through using an experienced and, more importantly, impartial research team. The research team benefits by access to large-scale experimental resources, by input of ideas from knowledgeable practitioners and through funding of people and resources.

The field of animal welfare science has evolved dramatically in recent years (Lawrence 2008). Much of this work has been conducted on experimental units. However, there is a growing recognition that welfare investigations also need to be conducted in a commercial environment (Dawkins 2006). Although welfare science is increasing, interpreting the results of scientific investigations may require value judgements that may vary between different experts. For example, two scientific panels from Australia and the European Union reviewed the welfare science relating to sow stalls and reached different conclusions about their acceptability (Fraser 2003).

Using a case example from the UK pig industry, this article aims to discuss potential difficulties that may arise from welfare science-industry collaborations. It also proposes possible methodologies to avoid compromise of the scientific integrity of the findings.

Case example — methodology

A three-year project, at the applied end of animal welfare science, is used as a case example for the experience of conducting industry-funded welfare science research. This project was funded by the pig industry through a levy from pig farmers on every pig sold. It was expected that the information derived through the project activities would be used to evaluate the feasibility and benefits of including welfare outcomes within the UK pig farm assurance (FA) process. Further, if these were found to be favourable, practical implementation within the industry would follow.

The information discussed in this paper was collected in a number of ways. The project had a steering group whose remit was to advise the researchers of the opinions of the stakeholder groups' members regarding issues associated with the planning and interpretation of the work, and the potential for implementation of the findings. It consisted of representatives from the industry sponsor, pig producer groups, farm assurance schemes, certification bodies and veterinary surgeons. Much of the discussion undertaken within the steering group about the individual welfare outcome measures and other issues, occurred by email or at the steering group meetings, where minutes were taken. Furthermore, several conference calls among the most active members of the steering group were recorded and transcribed, or minutes taken. Finally, the comments from

Table 1 Comments made during the project discussions that provide examples of the difficulties that arose during the UK pig industry project aimed at incorporating welfare outcome measures into certification schemes.*Comments about the value of the different welfare concepts*

- 1 “The pilot study needs to emphasise the lame, ill, tail-bitten areas” (Industry representative)
- 2 “There seems to be tensions between the Five Freedoms where behaviour is becoming over-riding at the expense of all others” (Pig producer)
- 3 “Nature does not consider welfare” (Pig veterinary surgeon)
- 4 “I am really struggling with these welfare classifications as they are completely alien to me as a pig-keeper” (Pig producer)

Comments about the welfare significance of tail lesions and tail docking

- 5 “Tail-docking [...] seems to assume so much importance to welfarists but to a pig-keeper is a very small relatively painless procedure (less than 30 s and the pig shows no sign of pain) which has the potential to significantly reduce the risk to the traumatic/life-threatening experience of a case of tail-biting” (Pig producer)
- 6 “Tail docking should not be a welfare negative. The majority of producers would see this as a minor inconvenience to the pig to prevent a much more serious problem for a small minority” (Industry representative)
- 7 “In order for there to be a tail-biting problem on the unit, there must be some degree of underlying welfare problem with the pigs (as indicated by a large number of scientific studies). However, it must be remembered that docking is treating a symptom. It is not the ‘cure’ for the underlying issues that trigger biting” (Representative from a high welfare scheme)
- 8 “I agree [...] that the pain associated with tail docking is comparable with many other routine and certainly chronic pain associated with a tail-biting lesion would be worse, however [...] the legislation is aiming at the underlying problem” (Welfare scientist)
- 9 “Although my own feeling is that tail docking is a very minor mutilation which barely causes the piglet discomfort if properly done, it has become a talisman for those who argue that better stockmanship and facilities would allow it to be discontinued. Since it is enshrined in legislation as a mutilation, on balance I believe the industry has to demonstrate more effort to minimise it than is currently the case. Whatever most producers feel, this issue has become part of the regulatory framework. The industry needs to make more effort to comply” (FA scheme representative)

Comments showing concern about challenging personal values

- 10 “We are dealing with some very powerful and emotive subjects here” (Pig veterinary surgeon)
- 11 “We cannot condemn 70% of the industry before we start” (Industry representative)
- 12 “I think this is in danger of demotivating an entire industry” (Pig producer)

formal consultations with veterinary surgeons on relevant matters were also used. It is important to note that the authors were also participants in these discussions and therefore recording and reporting had the potential to be biased. There was always at least one other welfare scientist present in meetings in addition to the authors.

During the project a number of difficulties arose. These are described below and some example comments are reported to illustrate the discussions (Table 1). As a means of understanding and resolving these differences an independent third party was asked to conduct a detailed review of the project and offer some ways to resolve the difficulties, aiding the remainder of the project (CT Whittemore, personal communication 2008).

Difficulties arising during the project

Differences in expectations and understanding

In the planning phase of this study there were a number of concerns from stakeholders regarding the welfare outcome measures proposed by the research team. Difficulties in developing a consensus regarding the choice of measures arose from differences in the expectations and understanding of the stakeholders attending the steering group.

Since welfare is a multi-faceted concept there is unlikely to ever be a single scientific measure of welfare (Mason & Mendl 1993). This uncertainty can be unsettling for those stakeholders expecting welfare science to have a single definitive approach. Furthermore, given that welfare science progressively develops these concepts over time (Lawrence 2008), it is not surprising that, during the course of a project, individual stakeholders had different expectations which may have generated unintended tension between those involved. For example, the researchers discussed some concepts with retailers at an early stage before the final selection of parameters. This was not ideal as there was the possibility for the measures to be implemented in the commercial context before a consensus had been produced across all parties.

Different individuals may place a different value on each of the three proposed concepts of animal welfare (Fraser *et al* 1997), ie physical fitness of an animal, its subjective experience and its degree of naturalness. For example, Bock and van Huik (2007) reported that some producers placed particular emphasis on the physical fitness of the pigs when considering welfare. Similar differences in emphasis were apparent in our project discussions. Typical comments about

the proposed measures which related more to an animal's affective state are shown in Table 1 (Comment 1–3). Some producers recognised that there was a difference between their perception of welfare and the emphasis on the subjective experience of the pigs by the welfare scientists and the representative from a high welfare FA scheme (Comment 4).

Consultations were undertaken during the project in order to gather wider industry views on the proposed measures. Additional consultations were conducted at the request of the steering group to give respondents ownership of those measures chosen for investigation. However, this process increased the number of measures, and this resulted in “the augmenting and complexing of the assessment load, such as to incur subsequent criticism from other elements of the same industry sector!” (CT Whittemore, personal communication 2008). In trying to please all stakeholders the eventual research farm welfare assessment protocol became too cumbersome for all measures to be adequately assessed on farms.

Discussion of controversial welfare issues

The debate within the farming community about legislative and market requirements affected the project discussions of some measures. For example, the assessment of tail lesions was proposed as a welfare outcome measure, as it was expected to provide information about the welfare of individual tail-bitten pigs as well as the underlying mental state of the biters. A review of the science supporting this approach was available for the project from a panel of scientific experts (European Food Standards Agency 2007). However, there was much debate about the significance of tail docking. At the time of the study it appeared likely that the UK Government would increasingly check compliance with legislation which stated that tail docking may not be carried out “unless other measures to improve environmental conditions or management systems have been taken” (The Welfare of Farmed Animals [England] Regulations 2007). Some producers were concerned that they would be forced to leave pig tails undocked, increasing the risk of uncontrolled tail biting, especially as there was pressure from retailers and a large food outlet to source more undocked, unbitten pigs.

Some participants in the discussions emphasised the value that tail docking has for protecting welfare (comment 5 and 6), whilst others suggested that tail biting is symptomatic of a more fundamental underlying welfare problem and represents a negative mental state for the biters (Comment 7 and 8). Others recognised that their views may not necessarily reflect those of the rest of society (Comment 9).

Challenging personal values

Any differences in welfare emphasis can go to the heart of peoples' values and, as such, can cause emotions to run high during project discussions. Any suggestion that the way pig producers keep their pigs may be seen by others to involve welfare compromises could be threatening to a producer's core values. As stock-keepers they must, and do, care about their stock in order to be able to do their job and this was evident in some of the responses given in consultations conducted during the project (Mullan *et al* 2010).

Examples of comments highlighting the importance of considering the beliefs of producers are shown in Table 1 (Comment 10–12). In particular, there was a concern that data could be used against the industry by detractors if not communicated accurately (comment 12).

Conflict with academic outcomes

This project also formed the basis of a doctorate thesis (Mullan 2009). The external review (CT Whittemore, personal communication 2008) identified that this may be a potential conflict of interest:

The ... imperatives of scientific penetration, precision, philosophy, boundary-nudging, risk-taking and innovation, inherent in a doctorate thesis, may not sit easy with, nor be well understood by, the industry sector. Especially if in the course of these ‘academic activities’ there may be livelihoods at stake.

The review considered that the industry partner may not wish to be overtly associated with some of the more experimental aspects of scientific research. For example, the project explored the potential that a pig-keeping score could help to recognise provision of ‘positive resources’ (Mullan *et al* 2011). The reviewer also considered that research team members made misjudgements whereby they were:

insufficiently alert to some elements of their methodology, justified in science, appearing bizarre and naive to industry pragmatists.

Proposed solutions to difficulties arising during the project

Allow sufficient time for dialogue

As the field of animal welfare science has evolved over recent decades there has been a lag period between the available scientific evidence and its application to produce animal welfare benefits (Lawrence 2008). This may provide one explanation for the difference in stakeholder attitudes to animal welfare concepts. Producers and others may find it difficult to reconcile all five freedoms, in particular in determining the weight that mental health and behavioural expression should take. Welfare scientists are more familiar with debates concerning the relative importance of different welfare measures. This is a key conceptual challenge in animal welfare science. Welfare scientists in turn may lack an insight into the relative importance of different aspects of welfare derived through personal experience of working with animals or an understanding of the economic cost of application of these measures relative to benefit, and therefore the difficulties of farm application. Efficient communication of the latest scientific ideas and evidence will reduce the inevitable time delay in the application welfare concepts on farms.

Allowing time for participants to recognise common ground is also important. For example, all parties recognised the welfare significance of painful tail lesions. Relating this to a restriction of normal behaviour, however, required justification from other scientific investigations, knowledge of which should not be assumed among all parties. These discussions should take place in an environment that is non-threatening to all parties.

Distinguish between experimental and applied science

The external review suggested that researchers should clearly identify which aspects of the research would be core to the aims of the project, and which were more complex, longer term or experimental. Further to this, researchers should also make clear to project participants associated with industry (in this case farmers, FA assessors and veterinary surgeons) when they were being asked to participate in core scientific work and in more experimental investigations. It was also suggested that the use of the industry sponsor logo could be reserved for use with those aspects of the project, agreed by the researcher and industry partner, which would be perceived by participants to be less controversial.

Ensure sufficient involvement from interested parties

One of the goals of the project steering group was that sufficient stakeholders were able to guide the research team through potential difficulties. In this project, unfortunately, there was a limited representation from active pig producers. Payment for their attendance may have overcome this. The external reviewer commented that the steering group, meeting relatively infrequently, found it “difficult to offer a balanced and immediate perspective” on the proposed research and therefore was not functioning effectively. As a result, the review encouraged researchers to explain their scientific and practical methodologies more thoroughly and for a small industry working party to be formed to offer an industry perspective on all aspects of the project as often as they arose. Involvement from all partners at an earlier stage to refine the detailed project objectives would have been invaluable in improving communication.

Use facilitation techniques to develop consensus

The final phase of the project required that recommendations, based on the available scientific evidence, were provided to the industry funders, ideally as a consensus from the steering group. In order to achieve this, researchers undertook training on group facilitation exercises, which were subsequently successfully employed to enable all steering group stakeholders to have an input into the final recommendations. This positive outcome required compromise from many of the parties but was a good example of co-operation, bringing together the practical experience of the industry representatives with the scientific knowledge of the research team. In this case, all agreed that the benefits of using welfare outcome measures included improved observation of pigs and enhanced discussions between producers and veterinarians. Despite differences in emphasis on aspects of animal welfare the value judgements required to produce recommendations were discussed, and eventually resolved sufficiently to generate a consensus.

Discussion

There is no doubt that it should be possible to conduct impartial scientific investigations in collaboration with industry. However, this case example highlights that such a collaborative project can generate certain challenges. This article aims to openly describe these problems. It also describes methods that may be relevant for other

projects, which should limit the impact of these difficulties on the scientific credibility and commercial relevance of their outputs.

If the ultimate aim of any project is animal welfare improvement then engagement with industry is essential. Aside from changes in legislation, schemes with industry backing are likely to be a significant route for widespread improvements in farm animal welfare. However, the differences in stakeholder expectations and understanding of what animal welfare represents was a considerable challenge during this project. Taking time to understand and work through these differences is crucial to applied animal welfare studies.

It is also important to consider if industry funding could have influenced the quality of the science. In other sectors, such as the pharmaceutical industry, it is recognised that the source of funding can affect the likelihood of publication of studies (eg Baker *et al* 2003). This has led to the formulation of guidelines that aim to reduce the impact of these potential conflicts of interest on scientific outputs (MRC 2005). Although this project did generate important new knowledge on the relationship between measures and optimum sampling strategies (Mullan *et al* 2009a,b), the time needed to ensure sufficient dialogue inevitably compromised the extent of scientific investigations. It is unclear whether the monetary support for the project or the requirement for industry endorsement of the measures contributed to the compromise in this case. More fundamental welfare science projects, which would be of less immediate relevance to an industry, may not have been exposed to such effects. This level of involvement was, however, important for this applied project which depended upon industry support for the potential application of its findings.

The goal of this project was to produce welfare assessment tools that were scientifically robust and applicable in a commercial context. So, although the welfare scientists may have been able to formulate assessment protocols without industry, the industry input was essential to ensure commercial relevance. There would have been little benefit in developing scientifically robust protocols that would not be used.

Animal welfare implications and conclusion

This article has aimed to report difficulties and propose possible solutions arising from a project working in close collaboration with the UK pig industry. It is hoped that such findings, and the discussion of solutions will be useful to other animal welfare science projects. An overriding principle for the solutions is to acknowledge and discuss potential difficulties.

This study has also highlighted some specific methodologies that help to establish a constructive relationship between scientists and industry funders. For example, the facilitation exercise was usefully employed to develop the final recommendations in this project. The role of the independent reviewer could also helpfully be used in research projects with industry partners to assist in establishing objectives and then testing progress against project milestones.

The real test of the success of the partnership in this sort of case could be measured by the impact of scientific publica-

tions on the one hand and implementation within industry on the other. In this case, implementation of the simple resolutions proposed by the project reviewer resulted in significant advances in our scientific knowledge and the production of an assessment tool that could practically be used by the industry.

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References

- Baker CB, Johnsrud MT, Crismon ML, Rosenheck R and Woods SW** 2003 Quantitative analysis of sponsorship bias in economic studies of antidepressants. *British Journal of Psychiatry* 183: 498-506
- Bock BB and van Huik MM** 2007 Pig farmers and animal welfare: a study of beliefs, attitudes and behaviour of pig producers across Europe. In: Kjaernes U, Miele M and Roex J (eds) *Attitudes of Consumers, Retailers and Producers to Farm Animal Welfare, Welfare Quality Report No 2* pp 73-124. Lelystad: The Netherlands
- Dawkins MS** 2006 A user's guide to animal welfare science. *Trends in Ecology & Evolution* 21: 77-82
- EFSA** 2007 The risks associated with tail biting in pigs and possible means to reduce the need for tail docking considering the different housing and husbandry systems. *The EFSA Journal* 611: 1-13
- Fraser D** 2003 Assessing animal welfare at the farm and group level: the interplay of science and values. *Animal Welfare* 12: 433-443
- Fraser D, Weary DM, Pajor EA and Milligan BN** 1997 A scientific conception of animal welfare that reflects ethical concerns. *Animal Welfare* 6: 187-205
- Lawrence AB** 2008 Applied animal behaviour science: past, present and future prospects. *Applied Animal Behaviour Science* 115: 1-24
- Mason G and Mendl M** 1993 Why is there no simple way of measuring animal welfare? *Animal Welfare* 2: 301-319
- MRC** 2005 *Good Research Practice* pp 3-4. Medical Research Council: London, UK
- Mullan S** 2009 *An evaluation of including some welfare outcome measures within UK pig farm assurance schemes*. PhD Thesis, University of Bristol, UK
- Mullan S, Edwards SA, Butterworth A, Whay HR and Main DCJ** 2009a Interdependence of welfare outcome measures and potential confounding factors on finishing pig farms. *Applied Animal Behaviour Science* 121: 25-31
- Mullan S, Edwards SA, Butterworth A, Whay HR and Main DCJ** 2011 A pilot investigation of possible positive system descriptors in finishing pigs. *Animal Welfare* 20: 439-449
- Mullan S, Browne WJ, Edwards S, Butterworth A, Whay HR and Main DCJ** 2009b The effect of sampling strategy on the estimated prevalence of welfare outcome measures on finishing pig farms. *Applied Animal Behaviour Science* 119: 39-48
- Mullan S, Butterworth A, Whay HR, Edwards SA and Main DCJ** 2010 Consultation of pig farmers on the inclusion of some welfare outcome assessments within UK farm assurance. *Veterinary Record* 166: 678-680
- The Welfare of Farmed Animals (England) Regulations** 2007 *Regulations*. Office of Public Sector Information: London, UK