

AN EXPLORATION OF THE LINKS BETWEEN LIVESTOCK DISEASE AND ANIMAL WELFARE

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This paper presents the method and preliminary results of an exploration into the relationship between animal welfare and livestock disease. The paper also illustrates how the Delphi survey technique may be used to assess the complex relationship between livestock disease and animal welfare.

Materials & Methods

Animal welfare is receiving ever increasing attention from consumers, politicians, academics and veterinarians. This being the case, there are now enforceable minimum animal welfare standards across the European Community, with guidelines in place for maintaining welfare above these levels. One of the key factors in maintaining high levels of animal welfare is the prevention of disease. In addition, reduced levels of animal welfare may increase disease susceptibility. For these two reasons any analysis of livestock disease or animal welfare must take into account the other.

To understand the linkage between livestock disease and animal welfare it is first necessary to identify what is meant by animal welfare. The concept of animal welfare means different things to different people. The concept of welfare as defined by a consumer may vary considerably from the definition used by a veterinarian or epidemiologist. As more attention is focused on animal welfare by a wider array of interested parties it becomes increasingly difficult to create a satisfactory working definition of animal welfare. Animal welfare as a concept suffers from not being singly definable – as would be the case with length or height (e.g. metres). Fraser¹ describes animal welfare as a type 3 concept – one which involves multiple attributes which cannot be measured objectively. With such a definition as Fraser's it is easy to question why animal welfare is measured at all.

In order to explore the linkage between animal welfare and disease some attempt needs to be made to measure welfare. There are methods that can and have previously been used as proxy measures of animal welfare. Measures of an animal's health, productivity, physiology, biochemistry and behaviour can all be used as proxies to indicate the welfare status of the animal (assuming therefore a correlation between them and animal welfare). Each particular method has its own problems and

limitations. For example, productivity can be measured in a number of ways (i.e. litres per day, per lactation, per unit of land etc.), all of which will give rise to different results. It is often argued that, for example, a dairy cow would not be high yielding if its welfare was poor. This type of argument can be very misleading as shown in Figure 1 (Bennett²), where moving from point A to point B increases production ($Prod_a$ to $Prod_b$) but reduces perceived animal welfare (Aw_a to Aw_b). The behaviour approach is equally subject to problems. In order to use a behavioural measure an assumption needs to be made as to what constitutes normal or expected behaviour. The comparison of farm animal behaviour with animals in the wild does not, in most cases, form a realistic comparison. Which ever method is employed, there needs to be some measure of the welfare status of an animal for any assessment of the impact of disease on welfare to be made.

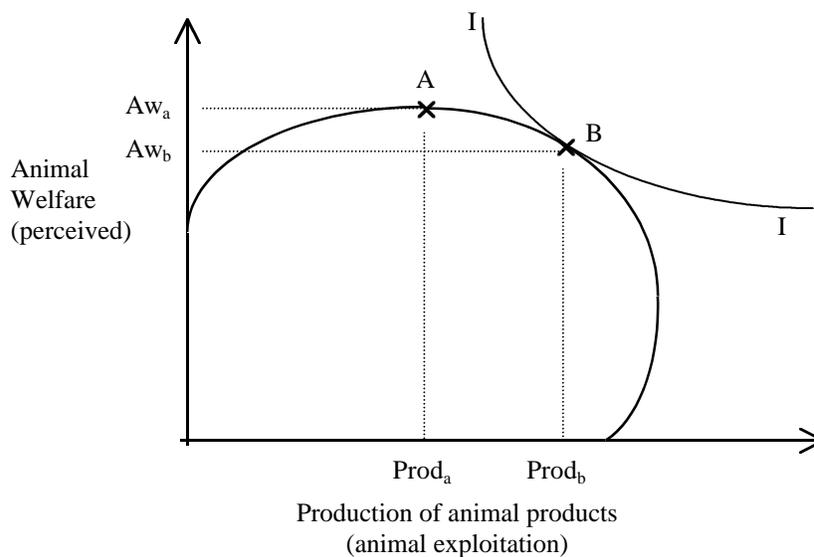


Figure 1: The relationship between (perceived) animal welfare and the production of animal products.

If the problems of measuring animal welfare are added to the difficulties of attributing welfare impacts to particular diseases, the whole notion of a link between animal welfare and disease may become rather subjective. One method that may help unravel the complex linkages between animal welfare and livestock disease is the Delphi survey, which is a formal means of pooling expert knowledge.

The Delphi approach has been adopted to assess the animal welfare impacts of disease. Mastitis and leptospirosis (*L.hardjo*) in cattle were chosen to develop the technique prior to its application to a wider range of livestock diseases. It is these two disease pilot surveys that have so far been undertaken and reported here.

Results

Exploratory Delphi surveys of veterinary experts with a knowledge of mastitis and/or leptospirosis in cattle were carried out. The survey asked respondents to

systematically identify each disease production effect and subsequently estimate their incidence. Respondents were then asked to assess the impact of those effects on the welfare of the individual animal. Table 1 identifies the main production effects cited for each disease and any other impact that may influence the animal's welfare, such as treatment with antibiotics. Once identified each respondent was asked to give their own view on how the disease impact effected the individual animal's welfare.

| L.hardjo impacts | Mastitis impacts |
|-----------------------------|----------------------------|
| Annual milk loss | Annual milk loss |
| Abortion | Premature cull |
| Weak calves / birth defects | Mortality |
| Infertility | |
| Treatment with antibiotics | Treatment with antibiotics |
| Vaccination | Dry cow therapy |

Table 1: Identified disease impacts for L.hardjo and mastitis in cattle which may have an effect on the individual animal's welfare.

Preliminary results demonstrate the difficulties in first identifying disease impacts and subsequently attributing changes in an animal's welfare to specific disease impacts. It was hoped that by breaking down the effect of disease into its specific impacts it would allow for each impact to be considered individually. The Delphi survey found that mastitis has a greater overall impact on the welfare of the animal - as might be expected if you consider the premature culling and mortality impacts of the disease. In both cases treatment with antibiotics was seen to have a positive impact on welfare, as was vaccination and dry cow therapy. Leptospirosis, although not as serious as mastitis in terms of severity of effects, was still considered by Delphi respondents to have a significant impact on the welfare of an animal.

Discussion

The results confirmed that mastitis has serious implications for animal welfare, while leptospirosis has a lower but still important welfare impact. If animal welfare is seen as a type 3 concept, the Delphi survey is a very useful and cost effective method to explore the animal welfare impacts associated with livestock diseases. As with all methods there are limitations to its use, not least its subjectivity. But it may be the only practical approach in the absence of any real data or a scientific method for evaluating the impact of disease on animal welfare.

Reference

¹Fraser D. Science, values and animal welfare: Exploring the 'inextricable connection'. *Animal Welfare* 1995; 4: 10-117.

²Bennett RM. Economics. In: Appleby MC and Hughes BO. *Animal Welfare*. Wallingford, UK: CAB International, 1997: 235-248.