Balancing public and private interests in EU food production

A.W.Stott, C.Milne, S.Peddie and G.J.Gunn

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Abstract

Reform of the CAP aims to de-couple subsidy from food production. It will also release funds for direct support of public goods that flow from agriculture. This highlights the need to ensure value for money through appropriate allocation of subsidy between competing public goods. Such allocations will depend not only on the relative value placed on a public good and the extent to which it is rewarded in existing markets, but also the ease with which it can be dealt with through policy mechanisms. Public goods that are understood, easy to identify, quantify, verify and fit into existing support frameworks are likely to be well safeguarded. Others that lack these attributes such as some animal diseases and animal welfare may be less well provided for. This point is illustrated using the example of bovine paratuberculosis (BPTB), a possible zoonosis. Using a survey of farmers and of vets and an adaptive conjoint analysis of risk factors we showed that the financial incentive to control BPTB at the farm level (private benefits) was relatively small and yet farmers were identified as the most important group for reducing any potential food safety risks. We therefore outline further research linking animal health/welfare with environmental benefits, reducing the relative weakness of the former in competition for policy support.

Introduction

Europe's Common Agricultural Policy (CAP) is placing greater importance on public goods such as food quality, food safety, environmental protection and improved animal health and welfare (European Union, 2005). This change is being driven by legislation and by changes in the CAP that de-couple farm subsidies from production and make them conditional on meeting certain standards associated with these public goods (Defra, 2005). It is vital that a coherent system of legislation and policy interventions develop that ensure a proper balance between public and private interests and between competing public goods. The objective of this paper is to illustrate some of the challenges involved through the example of bovine paratuberculosis (BPTB), also known as Johne's disease.

The pathogen that causes BPTB has been identified as a possible causative agent of Crohn's Disease (CD), an inflammatory bowel condition in humans (Rubery, 2001). This makes BPTB a potential food safety risk. However, despite the accumulation of a large body of evidence suggesting that MAP may be responsible for at least some cases of CD, the evidence is by no means conclusive (Peddie *et al*., 2005).

The European Commission (2000) in its White Paper on Food Safety declares that risk analysis must form the foundation on which food safety policy is based. A major problem with it is the many new or fast developing issues where level of scientific understanding is insufficient to undertake a rigorous risk analysis (Henson and Caswell, 1999). BPTB is a prime example (SAC, 2001). The EU favours the precautionary principle in such cases and gives primary responsibility for food safety to feed manufacturers, farmers and food operators. We therefore examine the pressures for and against control of BPTB at farm level as reflected in surveys of farmers and their veterinary practitioners in Scotland.

Methods

A telephone survey of 100 Scottish cattle farmers was carried out early in 2004. The aim of this survey was to assess farmers' perceptions of BPTB with respect to its economic importance at the farm level, its possible implications for human health and the most appropriate control mechanisms and how these should be funded. Total number of responses was 94. Sample selection was carried out independently by SAC's consultancy service.

A postal survey of 22 veterinary practices in the North East of Scotland was carried out in 2003. The sample was selected by SAC's Veterinary Services to include the major farm animal practices in the region. A total of 19 useable responses were received. The aims of the questionnaire were to assess the clinical significance of BPTB, its economic impact at farm level and the zoonotic potential of the causal organism.

Finally, a computer based adaptive conjoint analysis (ACA) was sent to 14 Scottish veterinary practices during 2004. Eleven responses were returned and analysed. The aim of the ACA was to gather experiential knowledge from vets about risk factors for

BPTB. ACA is based on the principles of conjoint analysis used in marketing research to probe consumer preferences for novel products and to help understand purchasing behaviour (Green and Srinivasan, 1990). The product or service under investigation is described in terms of key attributes (in this case risk factors) each of which can hold various mutually exclusive levels. The attributes, their levels and associated average zero-centred utility scores in this study are shown in Table 1. By using a computer-based technique, questioning can be adapted to reflect individual priorities and so minimise the interrogation necessary to extract utility scores. By suitable scaling (see Metegrano, 1994 for details), individual responses can be pooled to produce an average utility value for each level of each attribute. Further details of the ACA technique in this context can be found in Van Schaik *et al*. (1998) and in Stott *et al*. (2005).

Results

Both farmers and vets established that the farm was the most appropriate control point for BPTB. Farmers were asked, if there were a public health implication, where would be the most effective point of control? Over 88% ranked the farm as most important. The most popular choice for second rank was the processor (82%), with the retailer third (77%) and finally the consumer (77%). The vets were asked to rank stakeholders (producer, processor, veterinarian, retailer, consumer and government) for their importance in reducing the risk of BPTB pathogen transfer to the human population. Of the 17 practices responding to this question, 7 ranked the farmer first and a further 7 ranked the farmer second with the remainder ranking the farmer third. Top ranking was also given to the processor (2), the vet (3) and to government (5).

Farmers were asked to compare the economic impact of BPTB on their business to a list of 9 other common diseases or syndromes. The proportion of farmers ranking BPTB of greater impact than each of the other diseases is shown in Figure 1. A

Figure 1: Proportion of farmers ranking BPTB of greater economic impact

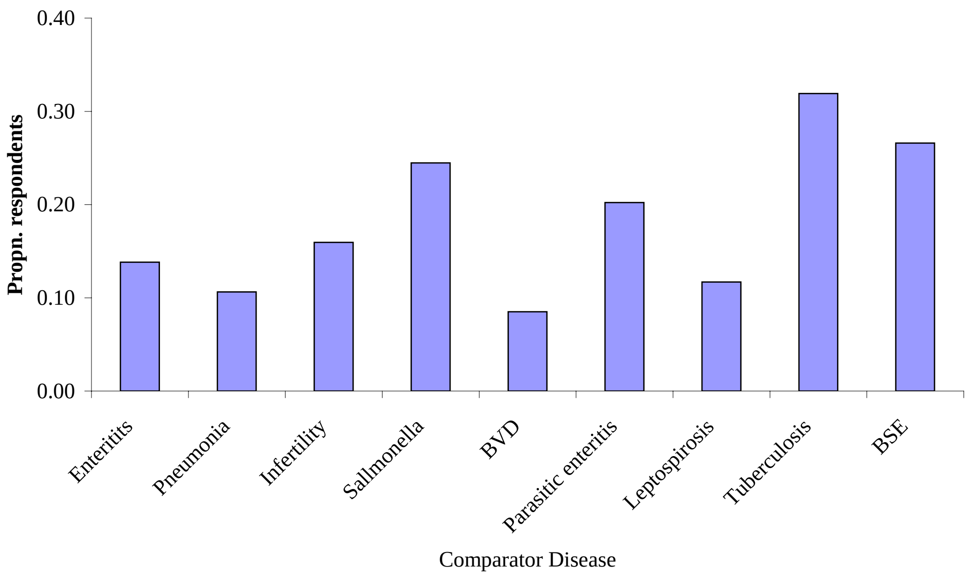


Table 1 Attributes, their levels and associated utility scores for the adaptive conjoint analysis of risk factors for BPTB (Johne's disease)

	Direct contact	Utility
1	Any direct contact with cattle from other herds known to be infected with Johne's disease.	-76.3
2	Any direct contact with cattle from other herds of unknown Johne's status.	-25.7
3	Direct contact only with cattle from other herds known to be free of Johne's disease.	43.0
4	No direct contact with any other cattle from other herds.	58.9
	Water supply	
1	Drinking water obtained from a secure mains supply.	34.9
2	Drinking water obtained from a borehole supply.	18.0
3	Drinking water obtained from a spring.	-8.9
4	Drinking water obtained from a riverine supply.	-44.1
	Herd Sizes	
1	Herd size of 0 to 5 cattle.	18.1
2	Herd size of 6 to 20 cattle.	3.2
3	Herd size of 21 to 50 cattle.	-1.3
4	Herd size of 51 to 100 cattle.	-8.5
5	Herd size of over 100 cattle.	-11.5
	Housing	
1	Cattle kept indoors in a bedded court; multiple age groups.	-30.6
2	Cattle kept indoors in a bedded court; single age groups.	10.4
3	Cattle kept indoors in cubicles.	-4.9
4	Cattle kept outdoors & sheltered; multiple age groups.	-0.5
5	Cattle kept outdoors & sheltered; single age groups.	25.7
	Indirect contact	
1	Any contact between the cattle herd and feces from other herds/flocks known to be infected with Johne's disease.	-80.9
2	Any contact between the cattle herd and feces from other herds/flocks of unknown Johne's disease status.	-25.2
3	Any contact between the cattle herd and feces from other herds/flocks known to be free of Johne's disease.	40.7
4	No contact with feces of cattle or sheep from other herds/flocks	65.4

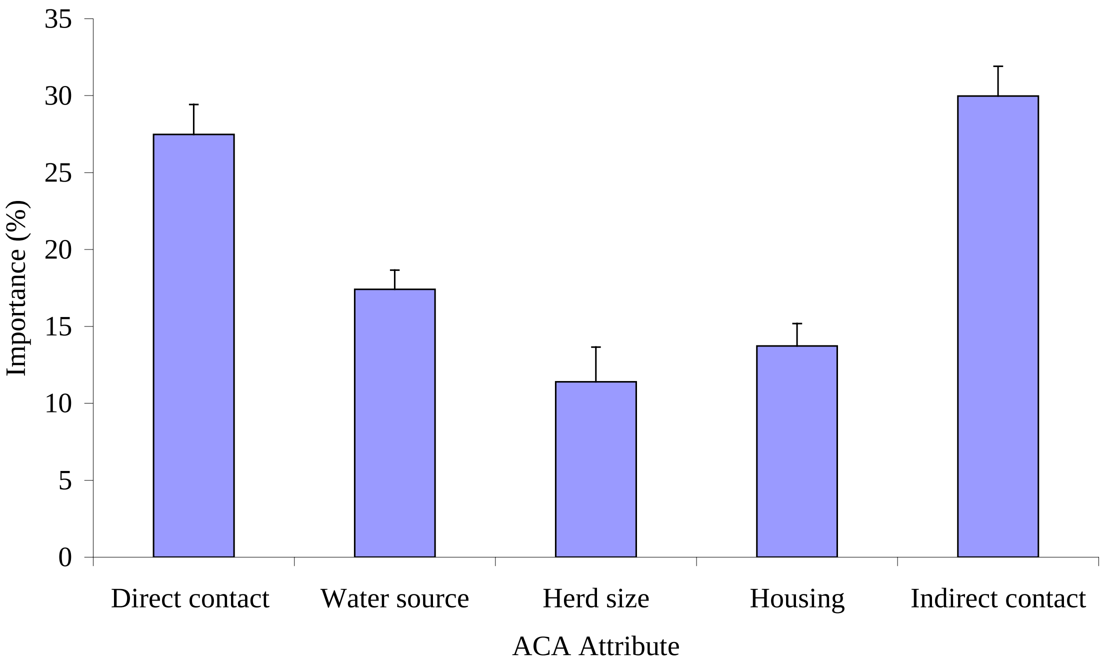
minority of farmers gave BPTB greater importance than each one of the comparator diseases. The median number of diseases where BPTB was of greater impact was one, the maximum 8. BPTB was the third most frequently cited disease (after mastitis and lameness) when vets were asked to list the five most clinically important diseases in cows aged over 24 months. However, when asked about the economic importance of

BPTB to their farmer clients, vets' median ranking was fifth among the nine other diseases listed in Figure 1. This may partly explain why only 4 farmers in our sample were members of a cattle health assurance scheme of which only 3 had chosen to target BPTB.

When asked if they were aware of any public health implications of Johne's Disease only 27% of farmers responded in the affirmative, 2% were unsure and the rest answered no. Vets were asked if information detailing the possible public health implications of Johne's Disease were readily accessible to veterinarians. The responses were 3, 15 and 1 for yes, no and don't know respectively. When vets were asked the same question but for farmers rather than veterinarians, the responses were 1, 13 and 5.

The mean importances of the ACA attributes (risk factors) and their associated standard errors are shown in Figure 2. Indirect contact and direct contact were generally considered more important than the other three attributes. However the

Figure 2: Mean and standard errors of ACA attribute importances (see Table 1)



standard errors were high reflecting some differences of opinion between practices. For example, although most practices (73%) gave indirect contact the highest importance, one practice ranked herd size as most important and two put water source in second place. The practice ranking herd size as most important put water source in second place. This practice had most experience of dealing with BPTB (6 to 10 client farms infected with 16 to 25 cases per farm).

Discussion

Our results demonstrate that the farm is the best place to control BPTB and hence reduce any potential food safety risk. However, the private benefits to the farmer are likely to be relatively small. This finding is backed up by other studies, e.g. SAC (2001), Stott *et al*. (2005) and Bennett (2003).

Surprisingly few farmers were aware of the zoonotic potential of BPTB. This may be a reflection of the lack of information on the issue noted by the vets. Lack of information in turn reflects the uncertainty surrounding BPTB. This is due in part to the long time course of the disease and hence limited sensitivity of diagnostic tests that hamper research (SAC, 2001). Awareness of a potential food safety scare that may reduce consumer demand and thus lower producer prices (McInerney, 2001) may encourage farmers to greater efforts to control disease even if the direct private net benefits are small. In the short term there is clearly a need for better communication of the risks despite the uncertainty (Peddie *et al*., 2005). Research into BPTB is needed in the longer term to reduce the uncertainty.

CAP reform will deprive farmers of market price support and so expose them to greater price risk (Harvey, 2001). Martin and McLeay (1998) found that New Zealand farmers faced with this problem adopted a range of risk-management strategies including pest and disease management. Farmers may therefore best be encouraged to control disease and hence deliver public goods by placing emphasis on the risks they face from disease rather than the average private costs and benefits (Stott, 2005). Our results support this assertion as farmers' ratings of the relative financial impact of BPTB varied widely (Figure 1) suggesting that experience with the disease is variable.

The importance of avoiding direct and indirect contact with infected animals (ACA survey) suggests that cattle movement will be a critical factor in the spread of the disease. Other diseases such as bovine tuberculosis and foot and mouth disease are also highly dependent upon cattle movement (Gilbert et al., 2005). However, cattle movement is an important aspect of farming in Britain, helping farmers and processors to make best use of their limited and varied resources. Chi et al. (2002) illustrate this point for BPTB and other endemic diseases in Canada as although buying cattle from auctions or dealers (cattle movement) was the greatest risk factor it was justified because of the cost of the alternative (operating a closed herd). The effects of CAP reform on the nature and extent of cattle movement will therefore be important for all stakeholders in agriculture. It seems likely that increased pressure from the market will concentrate cattle production and processing, adding to the need for transport of live cattle. In other areas smaller cattle herds may emerge in which food production is secondary to recreational or environmental reasons for keeping cattle. These changes will also alter the risks to stakeholders from animal disease. The risks are likely to be influenced by new policy initiatives such as Land Management Contracts in Scotland to be operated under the Rural Development Regulation as in France (Seerad, 2001). Most of these initiatives are aimed primarily at environmental benefits. It will therefore be important to monitor them closely for externalities associated with animal health or other public goods.

Other risk factors also hint at difficulties in controlling BPTB. The trend towards increased herd size is likely to continue in the quest for economies of scale despite the greater risk from BPTB indicated here. Supplying all drinking water from a secure mains supply is likely to prove impractical or unviable in many situations. Housing outdoors in single age groups may not always be possible and might in some cases conflict with restricted grazing practices that deliver environmental benefits.

SAC (2001) recommend assurance programmes for control of BPTB based on annual testing of adult stock to demonstrate absence from disease. Herds that are free of infection can then sell accredited breeding stock. This addresses the main risk factors highlighted by our ACA. If our finding of only 3 farmers (3.2%) in such a scheme is typical then control of BPTB by this method may need more encouragement. However, if a few farmers specialise in selling accredited breeding stock to many others by utilising such schemes good cost-benefit is likely. Such a situation will require a collective effort.

Conclusion

Lack of information and absence of wholly effective control methods make it difficult for farmers to control BPTB. The private benefits in doing so are in any case limited. Loss of public good may ensue due to a potential food safety risk and animal welfare implications but the risk and extent of loss is uncertain. In this situation BPTB may be neglected in favour of better understood causes. During the current period of CAP reform it is important that the BPTB issue and others like it do not get left behind. This will require a special research effort and closer linkage with other initiatives that might otherwise exacerbate the problem.

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