Preventive Veterinary Medicine 110 (2013) 456–466

Contents lists available at SciVerse ScienceDirect

Preventive Veterinary Medicine

journal homepage: www.elsevier.com/locate/prevetmed

Farmers' attitudes to disease risk management in England: A comparative analysis of sheep and pig farmers

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ARTICLE INFO

Article history:
Received 22 August 2012
Received in revised form 13 February 2013
Accepted 18 February 2013

Keywords:
Animal disease risk
Adoption
Biosecurity
Communication
Policy
Veterinarians
Biosecurity
Prevention

ABSTRACT

The UK Department for Environment, Food and Rural Affairs (Defra) identified practices to reduce the risk of animal disease outbreaks. We report on the response of sheep and pig farmers in England to promotion of these practices. A conceptual framework was established from research on factors influencing adoption of animal health practices, linking knowledge, attitudes, social influences and perceived constraints to the implementation of specific practices. Qualitative data were collected from nine sheep and six pig enterprises in 2011. Thematic analysis explored attitudes and responses to the proposed practices, and factors influencing the likelihood of implementation. Most feel they are doing all they can reasonably do to minimise disease risk and that practices not being implemented are either not relevant or ineffective. There is little awareness and concern about risk from unseen threats. Pig farmers place more emphasis than sheep farmers on controlling wildlife, staff and visitor management and staff training. The main factors that influence livestock farmers' decision on whether or not to implement a specific disease risk measure are: attitudes to, and perceptions of, disease risk; attitudes towards the specific measure and its efficacy; characteristics of the enterprise which they perceive as making a measure impractical; previous experience of a disease or of the measure; and the credibility of information and advice. Great importance is placed on access to authoritative information with most seeing vets as the prime source to interpret generic advice from national bodies in the local context. Uptake of disease risk measures could be increased by: improved risk communication through the farming press and vets to encourage farmers to recognise hidden threats; dissemination of credible early warning information to sharpen farmers' assessment of risk; and targeted information through training events, farming press, vets and other advisers, and farmer groups, tailored to the different categories of livestock farmer.

1. Introduction

England's climate lends itself to the production of grass (4.8 m ha) and crops (4 m ha), primarily winter cereals, supporting 5.4 m cattle, 14.3 m sheep and 3.6 m pigs (Defra, 2011). Sheep production is the most extensive system using both the less productive uplands and also lowland grass for finishing lambs in a stratified system involving regular movement of sheep and lambs between farms (Fogerty et al., 2012; Harvey and Scott, 2012). Pig production is more intensive, although comprising both indoor and outdoor systems, with either combined breeding and finishing units or separate enterprises (Lewis and Grayshon, 2012) again requiring movement across businesses.

Animal disease outbreaks have recently made headlines and the threat of disease is diverse and changing (Post, 2011). Some diseases are endemic, others characterised

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http://dx.doi.org/10.1016/j.prevetmed.2013.02.018

by specific outbreaks with new diseases arriving from expanding trade and climate change. The impact ranges from a small set-back in production to a devastating infection leading to widespread culling and every disease contracted affects farmers' returns.

To reduce the risk of animal disease, and its impact and cost, the UK Department for Environment, Food and Rural Affairs (Defra) identified key factors contributing to disease risks on farms and the mitigation measures needed (Table 2). Understanding whether farmers could be encouraged to adopt such measures is not comprehensive (Collier et al., 2010). Previous work in Europe identified that size of enterprise influences the adoption of biosecurity measures. Small and/or hobby farms generally lack appropriate biosecurity measures whereas commercial and larger businesses tend to have higher biosecurity measures associated with higher awareness and recognition of risk (Ribbens et al., 2008; Nöremark et al., 2009, 2010; Valeeva et al., 2011). Enterprise type is also an influence, with higher levels of biosecurity in pig enterprises (Boklund et al., 2004) and less in sheep enterprises (Nöremark et al., 2010).

However, farmer characteristics, including motivations and attitudes, also affect decision making on farms. There is evidence that farmers give more weight to biosecurity than animal health programmes (Valeeva et al., 2011). Yet research in Denmark (Kristensen and Jakobsen, 2011) suggests that even legislation on biosecurity plans does not always lead to uptake if benefits are not perceived. Farmers are strongly influenced by practice and implement what is familiar (Casal et al., 2007). This is partly down to lack of awareness (Racicot et al., 2012) but also confusion from inconsistent and contradictory information (Moore et al., 2008). Furthermore, lack of understanding limits effectiveness of implementation (Racicot et al., 2011, 2012). Cost is also an influence (Fraser et al., 2010) with farmers needing evidence of effectiveness before implementation (Gunn et al., 2008). There is also a feeling that both responsibility for biosecurity and cost should be shared and the way forward involves Government and industry including farmers and vets. There is also a need to build trust amongst stakeholders (Benjamin et al., 2010; Gunn et al., 2008; Hernández-Jover et al., 2012).

The study reported here examined factors encouraging and discouraging adoption of measures to mitigate disease risk, in order to determine policy levers and engagement strategies most likely to lead to risk reducing behaviours, overcome embedded resistance and encourage farmers to adopt these measures. We focus on sheep and pig enterprises, diverse sectors where the former are perceived as less concerned about biosecurity (Hovi et al., 2005) whilst the latter are perceived as extremely biosecurity conscious.

What follows outlines study method, results relating to understanding disease risk, Defra's mitigation measures, farm assurance, health plans and who should bear responsibility for disease control, before concluding what influences intentions and behaviours including awareness, knowledge, experience and attitudes, and implications of the findings for policy.

2. Method

The research involved face to face interviews with a sample of farmers running livestock enterprises. Most recent research in this area has used quantitative methods of data collection (mainly postal questionnaires) and analysis including summary descriptive statistics (Benjamin et al., 2010), factor analysis (Boklund et al., 2004), logistic regression (Ellis-Iversen et al., 2010), Theory of Reasoned Action (Garforth et al., 2006), Theory of Planned Behaviour (Jan et al., 2012) and rating scales (Jansen et al., 2010). We used the ability of qualitative methods to provide complementary insights to an understanding of human behaviour, using as their raw data the words in which participants in semi-structured, in-depth, face-to-face interviews articulate their knowledge, perceptions and feelings.

Interviews took place between February and April 2011 in three areas of England (south west, central southern, and Welsh Borders) providing good coverage of enterprise types, scales and systems. The focus was on farmers who were likely to be non-compliant with some of the disease risk reducing practices of interest to Defra. The study covered cattle and poultry (not reported here) as well as pigs and sheep (Garforth et al., 2011). Interviewee selection was based on a commercial telephone database and local knowledge through veterinary practices, to achieve an agreed quota of participants (see Table 1) in each sector.

Interviews were semi-structured. Where farmers operated more than one site, the interview focused on the site where the interview was conducted. Farmers were asked about interventions for reducing disease risk from: new diseases being brought onto farm by introduction of infected animals; disease being brought onto farm by visitors; new disease being brought onto farm from neighbouring farms; spread/multiplication of disease on the farm; introduction of new diseases onto farm by other animals; diseases propagating or going undetected; and disease spreading from their farm to other farms.

Each was specified in the interview schedules in terms of practices relevant to the enterprises (Table 2). Data gathered were largely qualitative, although information on the business and the area that might affect attitudes to disease risk mitigation was also obtained. Nine sheep farmers were interviewed and six pig farmers; interviews lasted 45–75 min, were audio-recorded and transcribed.

To help analysis, a framework was developed from literature on the influences on farmers' decisions regarding animal health and husbandry (Fig. 1). This identified factors expected to affect the intention to carry out actions to reduce, or manage, disease risk. Drawing on studies that have applied the Theory of Reasoned Action (TRA), Theory of Planned Behaviour (TpB) (Ajzen, 1985) and the Health Belief Model (HBM) (Rosenstock, 1974) in the field of animal health and farmer decision making (e.g. Garforth, 2011; Ellis-Iversen et al., 2010; Jansen et al., 2009; Garforth et al., 2006), we expected farmers' behaviour in respect of disease risk management would be influenced by: their *knowledge* of specific practices; their *attitudes* to specific practices (including their assessment of benefits, costs and risk) and to disease risk management in general; their view on the *efficacy* of practices in reducing disease risk (which, in TpB