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WHAT HAVE WE DONE TO ANIMAL HEALTH PLANNING?

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Abstract

Animal health planning has been widely promoted to farmers in many countries as a way to improve the health and welfare of their animals and contribute to other societal goals such as reducing greenhouse gas emissions. Although these benefits have been demonstrated and promoted widely there are still farmers who have not engaged in the active process of health planning and those that do not think it is a worthwhile process. Through the novel approach of examining animal health planning adoption using a stage behavioural model, the individual stages of adoption (from awareness to maintenance) were analysed using literature and primary data collected in an online survey. Results of the study show that there needs to be clarity on what animal health planning is and that awareness of it in the UK may not be as high as might be expected. These prerequisites need to be tackled before further barriers including improved data on the costs and benefits of health planning and quality of the base plan can be addressed. This paper demonstrates that behavioural stage models provide a valuable framework to study the whole process of behavioural adoption and can help identify barriers at each stage of the process, allowing advisors and extension officers to design effective interventions that will encourage farmers to actively health plan.

Keywords: Animal health planning, innovation, behavioural change process, behavioural maintenance, adoption

1. Introduction

Formalised animal health planning is one of a number of innovations with the potential to improve animal health and farm profitability. Conceptually by anticipating animal health challenges and identifying optimal management strategies livestock enterprises can be operated more efficiently and consequently more profitably. The potential for wider societal benefits such as reductions in zoonotic diseases, reduced carbon foot prints and spread of antimicrobial resistance are widely reported (DEFRA 2004). In the UK for 20 years or more health planning has been widely advocated by government, veterinarians and industry bodies, but the response of farmers is uncertain. Their level of real engagement is unclear from proxy indicators such as membership of farm assurance schemes where health plans are an entry condition (see for example Quality Meat Scotland (QMS 2011)). Moreover, there is evidence that participation in active health planning by many farmers is limited (Bell et al. 2006).

In this paper we report on a study that seeks to understand constraints on engagement and opportunities to improve the benefits that can be achieved through health planning. The approach taken systematically examines animal health planning from the perspective of farmers using a staged model of behaviour change. This methodology allows impediments and intervention opportunities to be identified, including activities that would be undertaken by Advisory Services or within skills development and education programmes. Primary data from a survey of Scottish farmers is brought together with results of published work and theories from economic and business studies.

2. Animal Health planning

There is a considerable body of literature on animal health planning; within this a number of alternative descriptions are found. Although animal health planning can have many purposes what is clear is that it relies on the philosophy that 'prevention is better than cure' (DEFRA 2004; Derks et al. 2012; Woods 2012). There is no widely accepted definition of animal health planning and individuals have different subjective interpretations of the term, making some typical research methods including large scale surveys difficult to standardise.

Here we differentiate between the animal health plan: a static document that that is not updated on a regular basis and animal health planning which is an on-going management process where health plans (formal or informal) are continually updated with any relevant new information that becomes available. Although written health plans can be a key component of the formal animal health planning process the continual reviewing of data and reassessment of risks are required to achieve optimum improvements. In addition, information on conditions in the farm's operating environment need to be reviewed, for instance local disease prevalence. This paradigm should not be conflated with the production of static health plans, such as those used solely for quality assurance or compliance.

When it comes to plan preparation and supporting animal health planning differing views are held on what should be monitored and reviewed as well as the role of advisors. Alternative health planning guidance and templates have been championed with good merit by organisations and experts around the world and often within the same country. This can be confusing for farmers though justified by differences in objective prioritisation and the expected likelihood that farmers can or will measure, monitor and act on all areas that health planning could improve. The quantity of information that a base health plan contains and how easily it can be updated is likely to depend on its medium, for example paper based; editable word processed document or report held within specialised health planning software. Written base plans have the advantage that they can be accessed and updated by many people such as farm staff and advisors. Involving external people in the health planning process can also be beneficial by providing unbiased advice, external knowledge and additional support to farmers (Nicholas and Jasinska 2008).

3. Stage models of behaviour change

Stage based behavioural models such as the precaution adoption process model (PAPM) have been widely used to explain and better understand behaviour changes, particularly in human health decisions. The PAPM has not been previously applied to animal health planning although within the literature there is much comment and many studies that relate to particular points defined in stage models. These treat behaviour change as a dynamic process and have four principle assumptions (Weinstein 1988):

1: a category system that defines the stages

2: an ordering of the stages,

3: the barriers to change faced by people in the same stage are common

4: the barriers to change can vary between stages

By considering the process of change from its earliest beginning through to completion and continuation of the new behaviour (*maintenance*) new and greater insights into adoption of innovations such as animal health planning can be gained (Weinstein 1988). In particular the identification of critical components that may be overlooked in models that partially examine the process (Weinstein 1988). New knowledge gained can be used to determine specific interventions that could overcome barriers to progress through the stages and so facilitate the design of comprehensive intervention programmes that will more effectively and efficiently support behavioural change.

In this study a seven stage model was used as shown in figure 1 (Weinstein et al. 2008).

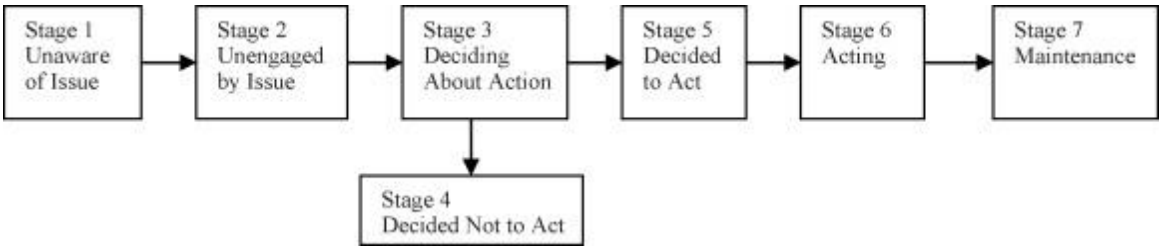

Figure 1. Illustrative example of the different stages of the Precaution Adoption Process Model

4. Applying a stage behaviour model

Using published literature and primary data collected in a survey of Scottish farmers adoption of animal health planning is examined using the seven stage model of behaviour change. The survey is on-going at point of writing and is being administered electronically using a convenience sampling approach. Potential participants have been invited to participate through advertising in the press and snowball sampling using SRUC networks.

Stage 1. Unaware of issue

Beginning with Stage 1, little is published on farmer awareness of formalised animal health planning. Reported surveys commonly start by asking if respondents have a health plan (see for example (ADAS 2007) – a question that is open to subjective interpretation depending on the respondents understanding and viewpoint. This finding relates to the earlier observations that there is no agreed definition of health planning, many differing interpretations and inconsistent usage of terminology (Nicholas and Jasinska 2008). It is therefore very difficult to establish whether potential beneficiaries are truly aware of what health planning might offer and the value of engaging with it (moving through stage 2 to stage 3). To date 61 Scottish farmers have completed our survey and of those five (8%) of the total 61 respondents stated that they did not know about formal animal health planning, which is arguably higher than might be expected given that the survey was administered electronically and therefore more accessible to the leading group of farmers. A further four respondents indicated they had learnt about formal health planning in the last 1-2 years.

Stages 2 and 3. Unengaged by issue - undecided about acting

Similarly it is difficult to determine the level of farmer engagement with animal health planning. High levels of membership with quality assurance schemes that require farmers to hold a health plan might indicate a good level of engagement. Although, holding a document that can be viewed at an inspection is a very different from active health planning: where disease and other livestock production measures are regularly monitored, recorded and appropriate actions selected to improve future performance. Studies of farmer attitudes are not necessarily a good indicator of their practice as discussed by Statham (2012). Thus interpretation of reported results from attitudinal studies relating to animal health plans can be difficult (see for example Bell (2006)) All of the farmers who participated in our survey that were aware of health planning indicated they had moved on to stage 3 with none deciding to disengage at this point. Yet, their reasons for considering health planning suggest that some may not have become fully engaged, for instance just over half of respondents stated that one of their main reasons for starting health planning was compliance with a farm assurance or government scheme. Therefore it is uncertain whether they have actively engaged with it or are on a parallel behavioural change pathway to holding an animal health plan purely in order to achieve a scheme entry requirement.

Once engaged with active health planning farmers may require a period time to decide on action (stage 3). This allows for collecting and evaluating information as is also described within classical decision making theory (see for example Rational Choice Theory, (Arrow 1963); and Subjective Expected Utility Theory (Savage 1972). A number of factors can block progression at this stage including:

- Insufficient information on the costs and benefits of health planning overall (Sibley 2006; Hall and Wapenaar 2012; Ifende et al. 2014)
- Information that is poor or inconsistent in quality (Sibley 2006); (Ifende et al. 2014)
- high transaction costs to obtain information (Coase 1993)
- biases (trust in available information) cognitive ability to evaluate likely outcomes (Ohlmer et al. 1998)

Professional consultants including veterinary surgeons can also play a key role as farmers may be strongly influenced by their advice and they may be the providers of key information (Sibley 2006; Atkinson 2010; Hall and Wapenaar 2012;).

Stage 4. Decided not to act

It would be easy to discount the farmers who choose not to progress to active health planning at this point. However, this is an important group of individuals for whom specific target interventions may be appropriate. The number of farmers who do not have a health plan is often used as a proxy for non-engagement but other applications of the PAPM have shown that people in stage 4 can be well informed (Blalock et al. 1996). In a study on herd health planning Derks et al. (2012) found that high expected costs, low expected returns and expectations of high time commitment were barriers to engagement. Similar reasons were also found in a study by Hall and Wapenaar (2012). Understanding these is essential to provide effective interventions that will re-engage (stage 3) them with the whole process.

Stages 5 and 6. Decided to act - Acting

For those who decide to act (stage 5), preparations are needed including making detailed implementation plans (Weinstein 2008). For example, assistance may be required from an external advisor to prepare the base health plan. There are three possible outcomes at this stage: barriers may be overcome, the process may stall or the farmer will disengage/decide not to continue. Careful formulation of survey questions are needed to separate out which of these paths is being followed. Evidence of these outcomes was found in our survey where four respondents stated that they didn't know how to go about getting a health plan, and had stalled.

The creation of a health plan that can be used in a proactive way (acting - stage 6) is a key observable output on the pathway to 'animal health planning'. However, as will be discussed later there is the potential that it will not be regularly reviewed, updated or acted upon (stage 7 – *maintenance*). Reasons reported in the literature for failure to progress at this point to active health planning include the high cost, time and effort of creating the initial health plan and problems with data collection (Bell et al. 2006; Lievaart et al. 2008). In our survey two respondents also stated that their health plans had not met their expectations, thus they did not consider them beneficial.

Stage 7. Maintenance

The final stage, maintenance, is defined as continuing the behaviour – in this case the on-going reviewing, updating and acting upon a base health plan. There is a lack of well-defined indicators making it difficult to monitor whether maintenance is occurring. For example, the frequency with which a health plan should be updated is not defined and will vary depending on factors including farm policies and livestock

system. This lack of clarity can be seen in health planning guidelines, for example 'It [health plan] should be reviewed when key information becomes available' (SRUC, 2014).

Barriers to maintenance are noted in the literature and include insufficient realisation of benefits, for example 48% of the farmers that Bell et al. (2006) surveyed recorded finding little or no benefit from their health plans. . Poor quality initial health plans were also a leading barrier, specifically; impractical advice; poor structure and lack of tailoring to the individual farm situation (Derks et al. 2012). Overall in Bell's survey almost half of respondents indicated their health plans were no longer active. In our survey, around 40% of respondents indicated that they would update their health plans more frequently if they perceived greater benefits. Others (approximately 12%) felt that the effort required for maintenance was higher than they could or were prepared to expend.

5. Discussion

This systematic analysis of the whole behavioural process of health planning adoption, from the point where farmers are unaware through to maintaining active animal health planning has highlighted a number of key barriers. It is evident therefore that much could be done to improve the uptake of active animal health planning, but it is essential to address the barriers in chronological order to ensure progress. Greater benefits could then be realised for farmers, the farming industry and society more widely. Advisory and support services along with skills development and education programmes could all have a vital role in identifying and addressing the barriers.

The first step is to establish an agreed definition or definitions for animal health planning, differentiating perhaps between static health plans that, once completed, are often to found in the bottom of a drawer or filing cabinet and active health (and production) planning as suggested by many including Nicholas (2008) Vaarst (2011) and Statham (2012). In the UK, the National Sheep Association has clearly distinguished between health plans and health planning for many years (Nicholas and Jasinksa 2008). A similar difference is promoted in the Dutch and UK dairy sectors with veterinary surgeons using the term Proactive herd health and production management (HH&PM). It is not known whether dairy farmers have grasped this distinction and not all dairy farmers are using a vet to help them with health planning, for example Bell et. al. (2006) found 32% of the health plans that they looked at did not have any veterinary input. Though the description of HH&PM given by Hall et al. (2012) ('regular scheduled farm visits [from vets] that go beyond the 'one-off' tasks such as pregnancy diagnosis, castrations and dehorning') would require adapting for application to other species and potentially other countries it is clear that there are moves within the UK and internationally to promote a distinct definition of active health planning.

Addressing the lack of information on the costs and benefits of health planning (Ifende et al. (2014)) will also be important if farmers are to become better engaged in active animal health planning and its maintenance. Critically, consistent financial benefits of health planning have not been demonstrated (Derks et al. (2014). Typically those promoting the benefits of health planning overlook or underestimate the costs of implementing these plans both in terms of money and time (Ifende et al. 2004). These information problems make it difficult for advisors to give good guidance and demonstrate cost-effectiveness (Hall 2012). Furthermore, it can lead to problems of trust in knowledge brokers.

Armed with a clear definition of animal health planning and robust information on the risks and benefits a target intervention programme can be put in place, an illustrative example is shown in table 1.

Table 1. Examples of what might be incorporated in a targeted intervention programme

Stages	**Example inventions**
Stage 1 to Stage 2 *(Unaware of issue – Unengaged issue)*	A programme promoting what animal health planning is and its value, including distinctions from static health plans
Stage 2 to Stage 3 *(Unengaged by issue - undecided about acting)*	Provision of an overview of animal health planning, the problems it can alleviate and its potential benefits by trusted brokers.
Stage 3 to Stage 4/5 *(Undecided about acting - Decided to act or Decided not to act)*	Communication of the of the risks, costs and benefits relevant to specific farms circumstances Demonstration of animal health planning in practice e.g. case study examples Provision of incentives e.g. expert support or enabling subsidy Introduction to health planning methods such as easily accessible/easy to use templates
Stage 5 to Stage 6 *(Decided to act – Acting)*	Detailed information on how to implement a health plan such as templates and computer programmes Support for provision of resources needed to act e.g. templates or external expert(s) Other incentives, such as making animal health planning necessary for compliance with a scheme
Stage 6 to Stage 7 *(Acting – Maintenance)*	Support for data collection and collation to evaluate benefits gained e.g. advice or grants for infrastructure developments such as automated systems for reading animal electronic identification tags. Support with analysis of data to quantify benefits realised Reminders to collect information and review it e.g. automated cues from advisors or computerised programmes Provision of motivating cues e.g. discussion of benchmark data and peer monitoring Provision of training for "experts" involved in health planning QA system for health planning

Such targeted intervention programmes can require actions from a set of people and institutions, including governments. Throughout the process of behavioural change better communication has been highlighted at several points as key to improving progress. While media messages can work well in raising awareness and move people from stage 1 to stage 2 (Weinstein 1988) trusted brokers can be critical in moving farmers to stage 2 and 3. This has been picked up in some commentaries such as Lovatt (2004) who lists examples of how vets can raise health planning's profile. A range of communication media can be effective, including the likes of DVD's as illustrated in the promotion of the Animal Health and Welfare Programme funded by Scottish Government.

The study highlights two failings that raise the question 'what have we done to animal health planning?' First, there is the problem of reconciling farmer expectations with the realities of the health planning process. This was found to be a key reason for farmers failing to maintain health planning behaviours. Second, more accurate communication of the role that a health plan makes in the process of health planning is needed. In our study many considered the health plan as a means to compliance with a scheme and had no expectations that it would improve the health and productivity of their livestock. Addressing these failings could lead to a step change in the adoption of animal health planning.

6. Conclusions

The stage model approach used here by systematically and holistically examining the animal health planning adoption process has shown that some of the pre-requisites have not been fully addressed. Specifically, clear contextualised definitions of animal health planning and a robust evidence base which acknowledges conditions where costs might exceed benefits. To increase adoption and the flow of farmers through the behaviour change process the identified barriers must be addressed. Advisory services, skills development and education programmes can all play key roles in overcoming these barriers. While the barriers will not universally apply in all cases - by farm or country - the staged model approach can be applied to identify local barriers and design an appropriate targeted intervention plan in a broad range of situations to achieve greater benefits for the farming sector and the wider public.

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