

A protocol for a systematic review into consumers' attitudes, beliefs and perceived ethical obligations towards farm animal welfare.

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Abstract

This article outlines a protocol for a systematic review into consumer attitudes, beliefs and perceived ethical obligations towards farm animal welfare, utilising both the Theory of Reasoned Action and the Theory of Planned Behaviour. A number of secondary objectives will also be explored in relation to the heterogeneity within the data relating to a number of variables known to vary within existing data including; animal species, welfare measures, socio-demographic and socio-economic characteristics.

The protocol outlines the rationale, objectives, inclusion criteria, search strategy and screening processes for the meta-analysis, and the plans for data extraction, risk of bias and data synthesis.

1. Protocol

1.1. Background

The public's ethical concerns have increased over recent years (Shaw, Shui & Clarke, 2000), with issues such as farm animal welfare becoming of increased interest to citizens and consumers (Bennett, Anderson & Blaney, 2002). The most recent Eurobarometer survey (European Commission, 2007) highlighted the European public's concern over farm animal welfare issues with the issue receiving an average rating of 7.8 out of 10 in terms of importance to them. This has implications for ensuring that welfare standards in production systems meet the public's expectations, that interventions to reduce production diseases are socially acceptable, and the corresponding implications of how farm animal production systems are regulated and supported to enable this.

Research in the domain has demonstrated that consumers are willing to pay (WTP) for a range of products that meet improved (i.e. exceed the minimum) standards of farm animal welfare (Napolitano *et al*, 2008; Carlsson, Frykblom & Lagerkvist, 2007; Bennett, 1996), providing evidence of niche markets for animal welfare products (Wathes *et al*, 2013). Heterogeneity within this has been explored in previous reviews (Lagerkvist & Hess, 2011) in relation to socio-demographic and socio-economic characteristics in addition to different aspects of welfare and different animal species, yet additional underlying variables that could further explain differences in behavioural intention have been neglected.

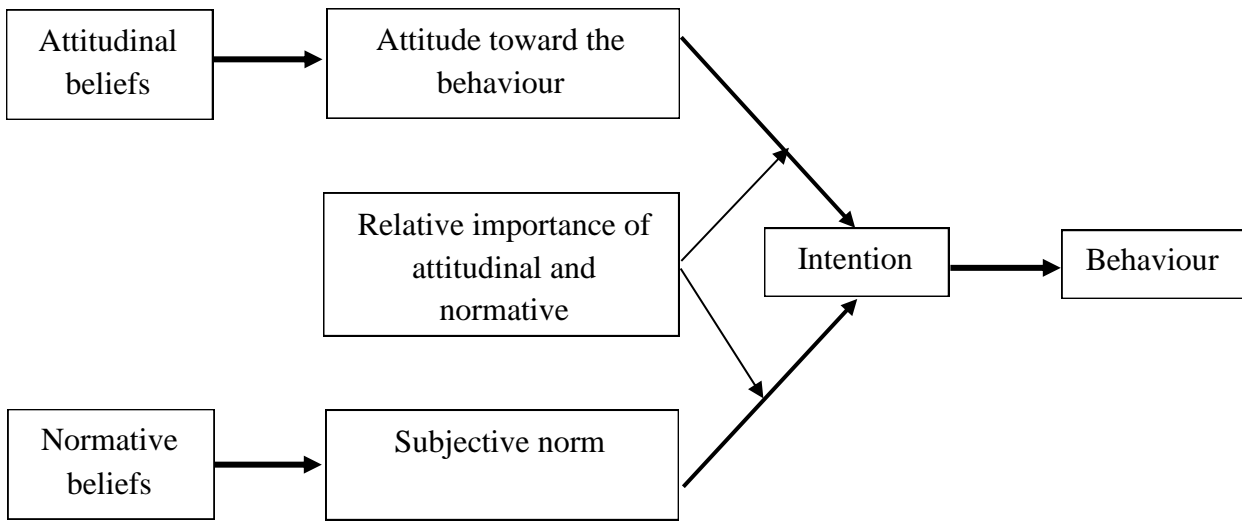
It is important to recognise these influences on behavioural intention, such as attitudes, beliefs and perceptions and explore how and why these vary in relation to farm animal welfare, so as to gain a greater understanding of behaviour.

A number of models exist that attempt to explain the link between attitude and behaviour (Shepherd, 1999), with the Theory of Reasoned Action (TRA; Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) and the Theory of Planned Behaviour (TPB; Ajzen 1991) being two of the most popular (figures 1 and 2 respectively). The TRA purports how volitional behaviour arises from behavioural intention, which is in turn influenced by an individual's attitude towards the behaviour, and their perceived social pressures (subjective norm) of performing the given behaviour, providing that they are all measured within the same context. The TPB further extends this to account for behaviours not fully under volitional control, by incorporating a third construct, perceived behavioural intention.

Each of the three constructs are a function of their corresponding salient beliefs (figure 1 and table 1; Ajzen, 1991; Fishbein & Ajzen, 1975), therefore it is important to gain an understanding of these so as to better comprehend the constructs influencing behavioural intention. Additional variables, such as emotion and attitudes towards objects or persons, are considered external to both models, and so influence behavioural intention via the impact that they have on beliefs (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975).

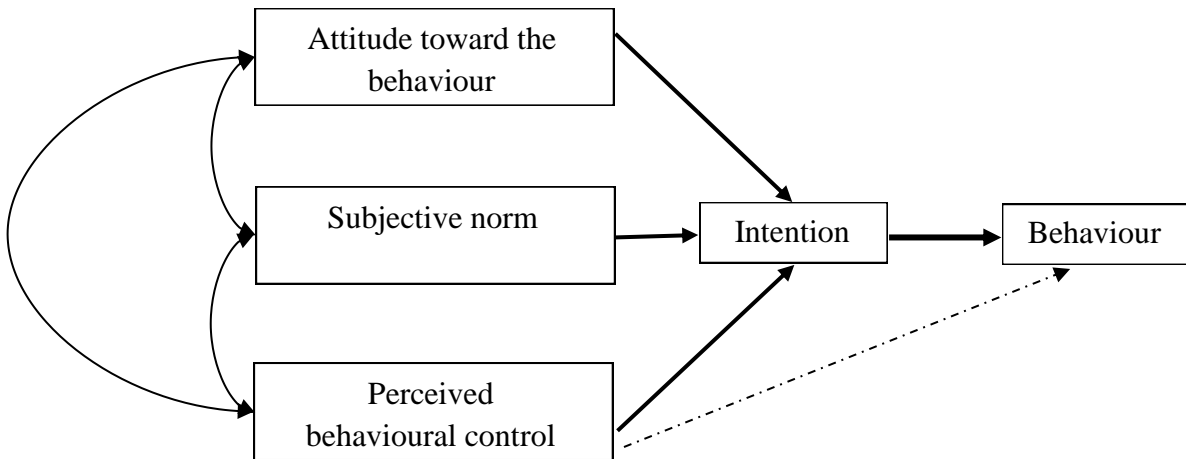
A summary of all three constructs and their associated beliefs can be found in table 1.

Figure 1: The Theory of Reasoned Action



Source: Fishbein & Ajzen (1975)

Figure 2: The Theory of Planned Behaviour



Source: Ajzen & Fishbein (1980)

Table 1: Constructs and associated beliefs associated with the Theory of Reasoned Action and the Theory of Planned Behaviour

Construct (model)	Description	Associated Beliefs
Attitude (TRA & TPB)	Individuals concerns regarding the overall evaluations of the behaviour as being positive or negative. In general, the more favourable the evaluation of the behaviour, the more likely an individual is to perform it.	Behavioural beliefs which are concerned with the likely outcomes of the behaviour.
Subjective norm (TRA & TPB)	Individuals concerns regarding the perceptions of the general social pressure about whether to engage in or not engage in a specified behaviour.	Normative beliefs which are concerned with the social pressure from specific others to perform the specified behaviour.
Perceived behavioural control (TPB only)	Individuals concerns in relation to how hard or how easy the specified behaviour is to perform. This construct reflects past experience and anticipation of obstacles, and normally involves the consideration of perceived barriers.	Control beliefs which are concerned with the power certain factors have to facilitate or inhibit the behaviour in question.

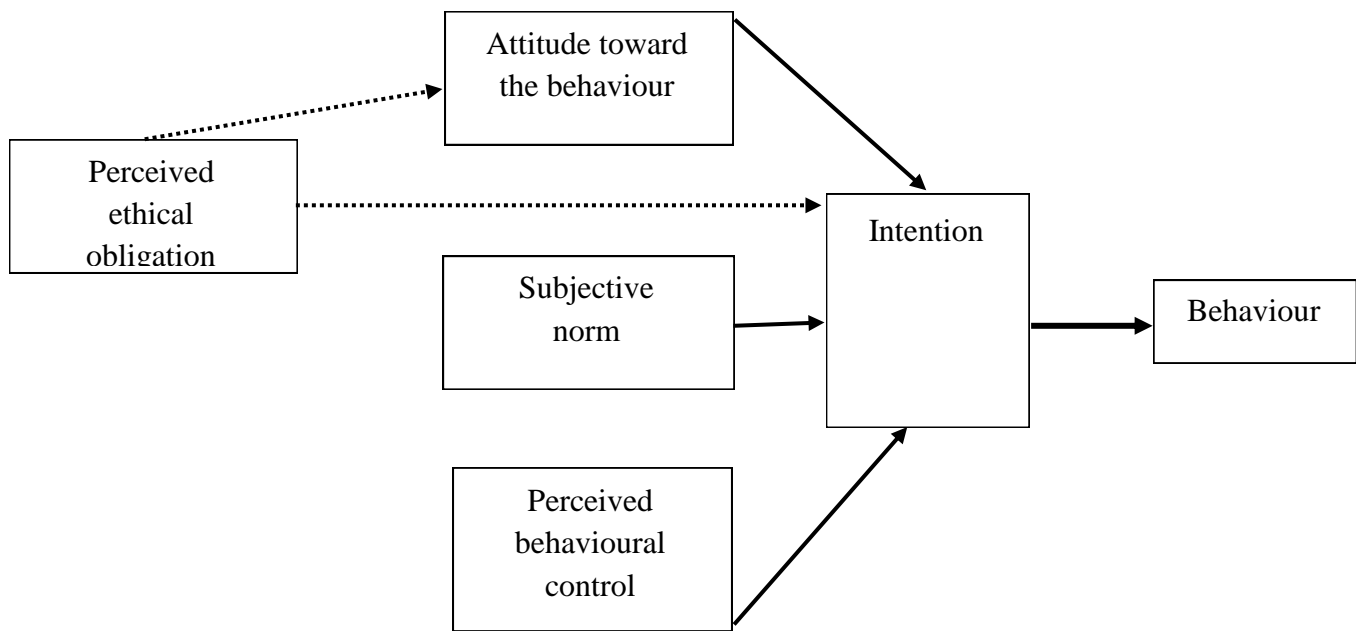
Adapted from Ajzen (1991)

Despite their apparent success of predicting behavioural intention, including in the food domain, it is acknowledged that additional constructs could be added to both the TRA and TPB to capture additional variance in intention (Connor & Armitage, 1998; Ajzen, 1991).

Of particular relevance to behaviours that do not just have self-interest motives, such as farm animal welfare, are constructs that take into account wider interests (Connor & Armitage, 1998). These broader interests include ethical concerns, which may be important motivational factors in behavioural intentions (Shaw & Shui, 2002). Perceived ethical obligation (PEO) is one such construct that seeks to do this, and allows for the inclusion of personal beliefs of what is right and wrong in relation to other beings, in this case animals (Shaw, Shui & Clarke, 2000).

A number of studies have incorporated PEO into both the TRA and TPB in relation to food choice (Shaw & Shui, 2002; Sparks & Shepherd, 2002; Sparks, Shepherd & Frewer, 1995), with the additional ethical construct being a significant independent predictor of behavioural intention both directly, or as an influence on attitude (figure 3). Therefore by incorporating this construct into the models it is expected that a greater percentage of intention will be explained in relation to farm animal welfare.

Figure 3: Hypothesised Theory of Planned Behaviour



Adapted from Shaw & Shui (2002).

As both the TRA and TPB have common components, it is important to gather information on these to establish the effect that each one has, so as to see if different outcomes in relation to behavioural intention are established in relation to the two theories, particularly with the incorporation of PEO. There is also a need to establish how variable or consistent each construct is in relation to behavioural intention. This will highlight whether more studies are required to explain the proposed models or whether they fail to have any predictive power.

It is important to explore the heterogeneity within the retrieved data, in relation to a multitude of different factors including socio-economic and socio-demographic characteristics which have been shown to elicit differences in WTP (Lagerkvist & Hess, 2011), and are important segmentation variables. Additionally, the difference in behavioural intention between consumers and citizens also needs to be established as this is believed to be an important factor in behavioural dissonance (Toma *et al*, 2011; Verbeke, 2009).

Different farm animal welfare aspects have also been shown to account for heterogeneity in the data (Lagerkvist & Hess, 2011) and it is important to explore these to see which aspects are of more concern to consumers.

Despite the importance of the area, there is no current synthesis of studies highlighting the public's attitudes towards animal welfare and the subsequent affects this has on behavioural intention, including any ethical considerations which may be incorporated into these decisions processes. Therefore this review seeks to establish the public's attitudes, perceived behavioural control, subjective norm and PEO in relation to farm animal welfare production systems, and their corresponding beliefs. Additionally factors that may explain heterogeneity in the data will be explored which will enable a better understanding of the variation in the public's behavioural intentions towards farm animal welfare.

As previous reviews have focused on the economic value consumers place on animal welfare, this review will focus on the underlying attitudes and beliefs underlying this, which are essential in tailoring products and policy going forward. The findings of the review will aid producers in the identification of potentially profitable niche marketing opportunities by highlighting how and why animal welfare adds value for consumers, enabling them to produce and market their products accordingly. This will enable livestock producers to make the best use of their resources to create the highest quality products for their intended target markets.

Additionally, policy makers will benefit from greater insights into the public's attitudes thus enabling them to construct the most appropriate procedures and interventions to ensure that minimum farm animal welfare standards, and interventions to improve these, are acceptable to the public. Finally, the findings of the review will be used to make recommendations for future research into this domain, including whether the TRA and/or TPB is an appropriate model of behavioural intention towards farm animal welfare.

1.2. Objectives

1.2.1. Primary objectives

As outlined in section 3.1, there is a need to identify, critically assess and summarise the public's attitudes and behavioural intentions towards farm animal welfare. This will be determined by the primary outcomes, which relate to the constructs of behavioural intention in the TRA, TPB and the addition of PEO and are as follows:

1. What are the global public's attitudes towards farm animal welfare?
2. What is the public's perceived behavioural control towards farm animal welfare?
3. What is the public's subjective norm towards farm animal welfare?
4. Do the public have a perceived ethical obligation towards farm animal welfare?
5. What are the sizes of effect and how large and consistent are they in relation to the TRA and TPB?

1.2.2. Secondary objectives

A number of secondary outcomes will also be examined and will be invaluable in helping to explain the primary outcome of the study. These relate to the beliefs outlined in both the TRA and TPB, and those concerned with PEO. Additional factors that may explain heterogeneity in the data will also be explored and are outlined as follows:

6. What are the public's beliefs in relation to farm animal welfare?
7. Do socio-demographic affect attitudes and beliefs in relation to farm animal welfare?
8. Do socio-economic factors affect attitudes and beliefs in relation to farm animal welfare?
9. Do different aspects of animal welfare affect attitudes and beliefs in relation to farm animal welfare?
10. Is there a difference in attitudes between consumers and citizens?

2. Interpretation of effect of magnitude

It is expected that as perceived ethical obligation increases, attitudes will also become more favourable towards farm animal welfare, which will in turn create more favourable behavioural intentions.

Additionally it is expected that the subjective norm in relation to farm animal welfare will have increased over time, as social pressures have increased for consumers to purchase welfare friendly products.

A range of attitudes and subsequently behavioural intentions will exist, with this heterogeneity in the returned data depending on several factors including age, gender, nationality and animal species as discussed in the secondary objectives.

However, beyond these broad generalisations it is unclear how large the effects are in relation to each other and the potential effect modifiers.

3. Criteria for considering studies for the review

3.1. Types of study to be included

Empirical studies of both a quantitative and qualitative design that measure consumer attitudes, preferences, perceptions, beliefs and perceived ethical obligations towards products produced to a specified animal welfare standard are to be included in the review. This includes, but is not limited to: quantitative and qualitative surveys, focus groups and interviews.

Any studies that have a focus on ethics or morality in relation to farm animal welfare will also be included, provided they meet the other eligibility criteria outlined in table 1. Only studies written in English will be included.

3.2. Types of participants

The study population for the review will be consumers of animal products, and wider citizens in the EU (table 1). Studies focusing on specific subgroups of the population and non-EU citizens will be included but variation in population characteristics will be considered in relation to the overall strength of evidence.

3.3. Types of outcome measures

The outcomes measured relate to the primary outcomes of the review, with a focus on the constructs that underlie consumer and citizens behavioural intentions towards farm animal welfare; attitudes, subjective norm, behavioural intention and PEO (table 1). Specifically these will relate to categorical responses, frequency and interval scales, with the latter being especially important in the measurement of attitudes in relation to both the TRA and TPB and is normally presented in Likert format.

Secondary outcomes will be measured as mean \pm standard deviation, confidence intervals, or as the percentage of participants who meet a certain criteria, with beliefs also likely to be measured using interval scales.

Table 1: Eligibility criteria

Study design	Empirical (qualitative and quantitative), English, Attitudes, perceptions, preferences, beliefs, ethical considerations, moral obligation, morality
Population	Consumers and/ or citizens
Outcome	Attitudes, preferences, beliefs, ethical obligation, societal norms

4. Search strategy for the identification of studies

4.1. Search strategy

A number of subject specific electronic databases will be searched; Scopus, AgEcon Search and ISC Web of Knowledge, and will include all studies published over the past 15 years so as to include the most up to date information. Google Scholar will also be searched as a source of grey literature.

In order to further reduce publication bias two further sources of grey literature will be examined. Firstly key authors in the field will be consulted to check for any unpublished findings and additional sources of information (Higgins & Green, 2011), and secondly reference lists of included studies will be checked for any further references not returned from the database searches.

Search terms will be refined after several trial searches to ensure the most successful search strategies are used. Face validity of the searches will be addressed by checking returned searches for key authors and articles.

Search strategies will be tailored for each database searched, with the specific search strategies to be reported in an Appendix in the final review. The core list of search terms for the review can be found in table 2. All search terms will be included in the topic, keyword, title and abstract sections of each individual database searched and used in conjunction with the Boolean operator AND as highlighted.

Where search sensitivity is low species related terms will be used to increase specificity, as highlighted in italics in table 2.

Table 2: Keywords considered for search

Type of Study and Outcome	Attitude*OR perception* OR belief* OR valu* OR intention*OR behav*OR purchas*OR ethic*OR pref*OR moral*OR consumer
AND	
Animal Species ¹	farm animal OR production animal <i>pig* OR swine* OR sow* OR hog* OR poultry OR broiler* OR chick* OR fowl OR turkey* OR hen* OR egg* OR meat OR pork OR piglet OR weaner OR poult* OR cattle*OR bovine*OR cow*OR beef OR horse*OR fish*OR ovine*OR sheep*OR caprin*OR lamb*OR mutton OR milk OR goat OR duck* OR turkey OR goose OR meat OR dairy OR beef</i>
AND	
Animal Welfare	Animal welfare OR health OR disease OR welfare OR production disease

¹Where search sensitivity is low species related terms will be used to increase specificity

4.2. Search screening

EndNote libraries will be constructed, with the principle researcher removing all duplicates before the results are sifted according to exclusion criteria in table 1. An overview of the search process will be included in a PRISMA flow chart (Moher *et al*, 2009) for ease of reference.

The search results will then be filtered in a two stage process as outlined below. Decisions of whether to include and exclude the articles will be noted in the EndNote entry for each result.

- 1) **Title and abstract search:** In addition to the full title the abstract of these studies will also be read by the primary researcher so as to minimise the risk of error (Higgins & Green, 2011). A second reviewer will then review at least 10% of the studies. Any differences between the two researchers will be resolved through discussion. Again if there is any doubt at this stage then the study will be included for stage two. If abstracts are not available at this stage then they will be included for stage two.
- 2) **Full text search:** the full text of all included studies will be read and assessed for relevance by the primary researcher. A second researcher will then review at least 10% of the studies. Any differences in decisions related to study eligibility will be discussed by the review authors.

Details of excluded studies will be provided at the full text stage only, listing the primary reason for exclusion in relation to the hierarchy of exclusion. Details of excluded studies at stages one can be obtained by contacting the corresponding author.

5. Methods of the review

5.1. Inclusion criteria

Studies obtained from the search will be selected based on the eligibility criteria outlined in table 1, to ensure only relevant materials are included. Studies will not be included if they fail to meet any of the criteria listed.

5.2. Assessment of risk of bias

The validity and the impact of bias will be addressed by use of a critical appraisal document that examines a number of quality criteria which have the potential to impact on the results of the study. Critical assessment will consider the construct validity, internal and external validity and reliability of included studies, as described by Yin (2009).

The quality appraisal tool (under development) will use elements of the Critical Appraisal Skills Programme checklists for both qualitative and quantitative research (CASP, 2013a; 2013b), the RATS qualitative research guidelines (Biomed Central, 2014; Clark, 2003). It will also be developed to ensure that it meets the guidance outlined in the Cochrane Handbook for Systematic Reviews of Interventions (Higgins & Green, 2011), Campbell Collaboration (2001) guidelines and the Centre for Reviews and Disseminations (2009) advice, to provide a document not based in a healthcare context.

No studies will be excluded based on the quality assessment tool, but the findings will be taken into account during the evidence synthesis. Quality appraisal will inform the overall assessment of strength of evidence and may inform sensitivity analysis. Any differences in decisions related to study quality will be discussed by the review authors.

5.3. Data management and extraction

Data will be extracted from the included studies using a data extraction form. This will be finalised as the nature of the data becomes apparent in relation to the relevant contribution of qualitative and quantitative data. The finalised data extraction form will be trialled by two independent researchers on five key papers known to be identified in the search process, to check that all relevant information is extracted. A template of the final form will be attached to the final review.

All data will be extracted by the primary researcher, with a subset of at least 10% of the included studies checked by a second researcher independently, again to check for potential errors. Where information is missing efforts will be made to contact the authors to obtain further details (Higgins & Green, 2011).

5.4. Data synthesis

Firstly descriptive results of the review will be presented, detailing the study characteristics and findings. This will be followed by a narrative analysis of the extracted information which will follow ESRC Narrative Synthesis guidance (Popay *et al*, 2006), and will explore the variations and relationships in the data. Additionally any changes in behavioural intention overtime will be reported. Qualitative and quantitative data will then be analysed in separate streams as outlined below.

Qualitative studies will be exported into Nvivo and coded according to both the primary and secondary objectives. Data will then be explored using a thematic approach so as to link any information containing shared attitudes and views (Thomas & Harden, 2008; Braun & Clarke, 2006).

Subsequently, if a sufficient number of studies are obtained then a random effects meta-analysis and meta-regressions will be conducted (further details to be provided at a later date). Simulation procedures will be used to derive variances for weighting based on the sample sizes of the studies. AIC will be used to minimise over fitting when exploring heterogeneity (Koricheva, Gurevitch & Mengersen, 2013). Sensitivity analyses will be conducted to explore the risk of bias where appropriate. Similarly, funnel plots and tests of funnel plot asymmetry will be used to assess potential publication bias despite their known limitations.

Qualitative and quantitative synthesis activities will be used to explore individual constructs and beliefs associated with the TRA and TPB. Subsequent evidence contextualisations will assess the strength of evidence in relation to each model.

The adaptive grade framework (Meader *et al*, 2013) will be used to assess the strength of evidence, and again will be adapted to reflect the non-healthcare setting of the review (c.f. Barański *et al*, 2014). Quantitative and qualitative will then be drawn together and the implications of the review will be discussed in relation to the context of the objectives and wider policy and production implications.

6. Acknowledgements

The author would like to thank the advisory group for consultation of the protocol and associated quality appraisal documents.

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8. Supplementary Information

8.1. Feedback

Feedback on the protocol from the advisory team was obtained and gratefully received.

8.2. Plans for updating the protocol

Section 5.4 relating to data synthesis will be confirmed after critical appraisal, but prior to the extraction of outcomes, once the nature of the data has become apparent. Data finalisation of the critical appraisal tool will also be reported.

9. About the Article

9.1. Anticipated contributions of authors

Protocol development: BC, GS, LP, LF

Run search: BC

Identification relevant titles and abstracts: BC

Identification relevant studies: BC

Obtain relevant studies: BC

Data extraction: BC

Quality appraisal: BC, GS

Data analysis and interpretation: BC, GS, LP, LF

Draft review: BC, GS, LP, LF

9.2. Advisory group

The advisory group consisted of Richard Bennett, Richard Tranter, Philip Jones (University of Reading), Jarkko Niemi and Latvala Terhi (MTT Agrifood Research Finland).

9.3. Declarations of interest

Gavin Stewart is an associate editor of Peer J. Lynn Frewer has previous publications relating to animal welfare and the Theory of Planned Behaviour.

9.4. Sources of support

This review was funded by the FP7 PROHEALTH EU project.

9.5. Preliminary timeframe

Protocol development: October - November 2014

Database searching: December 2014

Data sifting: December 2014 – January 2015

Data extraction: January – February 2015

Quality appraisal: February- March 2015

Data analysis: March –May 2015

Key conclusions: May 2015