Adolescents care but don't feel responsible for farm animal welfare

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Abstract

Adolescents are the next generation of consumers with the potential to raise standards of farm animal welfare — to *their* satisfaction — if their preferences and concerns are translated into accurate market drivers and signals. There are no published data about adolescent views of farm animal welfare to allow meaningful design, implementation and evaluation of educational strategies to improve consideration of — and behaviour — towards farm animals. Knowledge of, beliefs regarding, attitudes about and behavioural intention relevant to farm animal welfare were determined in a sample of UK adolescents, using a survey incorporating an extended version of the theory of planned behaviour and novel assessment tools. Our results indicate that adolescents have only a limited knowledge of welfare problems for farm animals or welfare-relevant product labels. Intentions to identify welfare standards of their food were weak. Although they cared about farm animal welfare and agreed with fundamental principles, e.g. the provision of space and the absence of pain and suffering, in common with adults they held limited belief in the power and responsibility which they possess through their choices as consumers; responsibility was often shifted to others such as the Government and farmers.

Key words: *Adolescents, Attitudes, Beliefs, Behavioural intention, Farm animal welfare, Knowledge, Theory of planned behaviour*

Introduction

Many studies have addressed stakeholders', including adult consumers, views of and concerns about farm animal welfare (e.g. European Commission 2007; Verbeke 2009). For farmed animals, it is the consumer's purchases of animal products such as meat, milk or eggs, which can substantially affect welfare standards (FAWC, 2006; Regmi & Gehlhar, 2001); adolescents are future policy makers and consumers but may not perceive that they possess immediate consumer power. However, the knowledge that they acquire through education (at school and elsewhere), together with cultural attitudes and exposure to societal use and representation of animals (Rudman, 2004) all contribute to their decisions as active consumers later in life.

Education is of growing interest as a mechanism to improve consideration of — and behaviour towards — animals (e.g. European Commission, 2010; FAWC, 2011a), but its impact is difficult to determine without knowing a population's current views (Jamieson & et al., 2012). Despite research about adult consumers' concern (e.g. European Commission, 2007; Kjaernes, 2007) and children's understanding of, attitudes towards, and emotional attachment to animals (Muldoon, Williams, Lawrence, Lakestani & Currie, 2009), there is little literature focusing on adolescents' perceptions of farm animal welfare. What is available demonstrates that adolescents, though holding generally positive attitudes to animals, afford lower considerations to agricultural species in comparison with pets and use distancing mechanisms to cope with societal use of animals for meat and other products (DeRosa, 1987; Ellis & Irvine, 2010; Jamieson & et al., 2012).

There is also an absence of tools to determine adolescents' views about animal welfare. Existing adult-directed assessment tools are not necessarily suitable for the adolescent audience; requiring excessive concentration, or using audience-specific language / content (e.g. Kauppinen & et al., 2010; Austin, Deary, Edwards-Jones & Arey, 2005). Limited literature exists which combines citizen-oriented attitudes towards farm animal welfare and beliefs with more consumer-oriented behaviours (Vanhonacker, Verbeke, Van Poucke & Tuyttens, 2007). As the exact relationship between attitude, knowledge and behaviour is unclear (e.g. Shrigley, 1990; Wallace, Paulson, Lord & Bond, 2005), assumption of a positive relationship may be inappropriate and it is imperative to measure multiple pertinent variables to explore those which drive relevant behaviour. When a direct measure of behaviour is not

readily available or logistically possible, Ajzen's theory of planned behaviour (Figure 1; Ajzen, 1991; Ajzen, 2002) has been used. Behavioural intention indicates an individual's readiness to perform a given behaviour and is viewed as the immediate precedent. Ajzen's theory illustrates that behavioural intention is guided by: (a) attitude towards a behaviour, i.e. the extent to which an individual perceives the behaviour as favourable or useful; (b) subjective norm, i.e. the extent to which an individual perceives others want them to perform the behaviour; and (c) perceived behavioural control, i.e. the extent to which an individual feels they can engage with and are able to perform the behaviour. The theory has been shown to be robust in relation to other measures of adolescent consumptive behaviour (e.g. Vermeir & Verbeke, 2008), in the context of farmers' intentions with regards to farm animal welfare (e.g. Coleman, McGregor, Hemsworth, Boyce & Dowling, 2003; Kauppinen, Vainio, Valros, Rita & Vesala, 2010), and it is often applied to studies of the relationships among beliefs, attitudes, behavioral intentions and behaviours in various other fields. It offers a basic framework from which a model could be developed to determine the impact of additional variables, such as knowledge.

[Figure 1 here]

To understand adolescents' potential role as future consumers of farm animal products, and to evaluate the efficacy of education as a means by which to improve their consideration of farm animals' welfare, it is important to determine current associated adolescent views. This study sought to provide a national benchmark in the UK of adolescents' (14 to 15 year-old secondary school attendees) views about farm animal welfare, and assess those variables which may predict a specific, farm animal welfare-relevant behavioural intention. To address the lack of robust and relevant assessment tools in the specific study of attitudes towards farm animal welfare, novel assessment methods were developed.

Aims

The aims were:

1. to determine adolescent beliefs about, knowledge regarding, and attitudes towards farm animal welfare;

2. to assess the behavioural intention of adolescents about the welfare standards of their food
3. to examine whether the constructs of Ajzen's theory of planned behaviour can be used to predict these intentions, and;
4. to examine factors influencing behavioural intention.

Materials and Methods

A questionnaire was devised and subsequently approved by the RVC's Ethical Review Committee. A pilot study was used with non-study, year 10 adolescents to check suitability and reliability (n = 30, 14-15 year olds).

Questionnaire design

The questionnaire (available from the first author) comprised four sections concerning (a) beliefs about, (b) attitudes to, (c) knowledge of and (d) behavioural intention regarding farm animal welfare. Two statements, measured on a Likert scale from 'strongly agree' to 'strongly disagree', were included to check for social desirability effects. Respondent demographics previously shown to affect views of animal welfare were also determined: i.e. area of residence (urban / rural), pet ownership, diet and gender (Herzog, 2007; Hills, 1993; Izmirli & Phillips, 2011; Paul & Serpell, 1993; Te Velde, Aarts & Van Woerkum, 2002).

Beliefs

Belief assessment allowed comparison with previous findings for adult consumers (Welfare Quality Project 2007a; Welfare Quality Project 2007b). It covered concern for farm animal welfare, relative perception of species' welfare and responsibility to improve farm animal welfare. Respondents ranked six farm species (broiler chickens, laying hens, pigs, beef cows, dairy cows and sheep) from perceived best (1) to worst (6) welfare, and ranked responsibility of various groups (veterinarians, the general public, supermarkets, charities, Government, and farmers) for improving farm animal welfare.

Knowledge

Seven questions (multiple choice and open formats) were posed to determine adolescents' knowledge of common welfare issues (for broiler and egg laying chickens, dairy and beef cows, sheep and pigs), and of welfare standard labelling, which affects their ability to purchase products representative of animal welfare standards above the legal minimum. Adolescents were given one mark for each correct answer (maximum score of seven).

Attitude

A novel scale was devised to address attitudes specific to farm animal welfare. Welfare was considered an ethical concern for the mental and physical health of animals over which we have a degree of control or ownership (Lawrence & Stott, 2010) and so the scale encompassed more than just species level considerations in accordance with this broader definition. The Attitude to Farm Animal Welfare Scale (hereafter referred to as the AFAWS) comprised 14 statement pairs; one statement within each pair expressed positively and one negatively to allow reliability assessment, answered on 7-point unipolar Likert scales from 'strongly agree' to 'strongly disagree'. Although not an exhaustive list, these statements formed four themes on which adolescents commonly based their views when discussing various aspects of farm animal welfare (discussions took place with 27 students from six schools, external to the main data collection, on the key aspects on which they felt they based their views on animal welfare and contexts they considered relevant). The statements were:

1. Pain and suffering (6 statements), e.g. *"It doesn't matter if a farm animal is in pain"*
2. Space / behavioural freedom (8 statements), e.g. *"Living conditions provided for farm animals should not restrict their movements or normal behaviours"*
3. Consumer responsibility / ability to improve farm animal welfare (8 statements), e.g. *"I can make a positive difference to the way farm animals are treated"*
4. Perceived importance of farm animal welfare (6 statements), e.g. *"Not enough consideration is given to the welfare of farm animals these days"*.

Reliability testing (Cronbach's alpha) at the pilot stage indicated within statement-pair reliability and high internal consistency both overall and within themes: all $\alpha > 0.7$ (George & Mallery, 2003; Gliem & Gliem, 2003).

Behavioural Intention

Consumers influence standards of farm animal welfare through their purchases; adolescents make some purchases of animal products, e.g. when out with friends or buying for lunch though few purchase food on a household scale. Thus, adolescents are dependent to a large extent on what their carers purchase for them. For this reason, the study did not focus on their intentions to purchase animal products of a certain welfare standard but instead focussed on a precursor of such behaviour, i.e. the behavioural intention of individuals to identify the welfare standards of the farm animals used to produce the food (eggs, meat and dairy) they consume (Figure 1). Respondents were informed within the questionnaire that *"identify means that if you were served an animal product at home, or were selecting or buying food containing an animal product in a shop / school, would you either look for information on the welfare standards involved, such as a label or ask your parent / a shop-seller for the information"*. This provided a good starting point and pre-requisite from which adolescents can become more informed about animal welfare and more-conscientious consumers. The intention was piloted and developed based on discussions with a sample of adolescents regarding the type of intention which they perceived to be both possible and relevant to their age-group (as with the AFAWS statements; 27 students from six schools). Following Ajzen's theory of planned behaviour, respondents were asked to rate statements regarding their view of this behavioural intention, and three direct measures of the model constructs (constraints on questionnaire length necessitated exclusion of indirect measures):

1. Behavioural intention, four statements e.g. "*From now on, I will make an effort to identify the welfare standards of the farm animals used in the production of my food"*;
2. Perceived behavioural control, six statements addressing controllability e.g. *"There are many things which prevent me from identifying the welfare standards of the farm animals used in the production of my food"*, and self efficacy, e.g. *"It would be really easy for me to identify the welfare standards of the farm animals used in the production of my food"*;
3. Subjective norm, three statements, e.g. *"People in my life whose opinions I value think that it is important to be able to identify the welfare standards involved in producing the food which I consume";* and
4. Attitude towards the behaviour, five statements: importance, interest, usefulness, worthiness, and overall evaluation, measured on 7-point bipolar Likert scales.

Unless otherwise indicated, all statements were measured on 7-point unipolar Likert scales from 'strong agreement' to 'strong disagreement', though specific terms varied according to the individual wording of each statement.

Participants and Procedure

The online questionnaire (Survey Monkey™) was deployed via the e-mail service sprint mail (Sprint Media Ltd) on September 8th 2010 through emails to the Heads of Science and Citizenship in a cross-sectional sample of 5911 UK schools. Participation was up to the discretion of the teachers and the final number of students whom the questionnaire reached before they were able to decide whether or not to complete the survey cannot be identified. The survey was left open until December 18th 2010. A reminder email was sent on November 4th 2010.

1274 responses were obtained from > 51 schools (not all schools provided identification since this was optional to aid confidentiality). Data were rigorously examined and responses removed if they failed to meet the criteria of completeness, reliability and low levels of social desirability (see Appendix 1), leaving 423 (33% of total) responses in the final sample.

The ratio of male to female respondents was 43% (n = 182) male to 57% (241) female, with the average and majority age (range 14 - 15) of 14 years old (84%, n = 355). Respondents lived mainly in urban areas (66%, n = 281) and 87% (n = 369) owned a pet, either currently or previously. The majority ate meat (92%, n = 389), with those 34 adolescents avoiding meat citing taste / texture (76%, n = 26) and/or welfare (65%, n = 22) as the main reasons for this (multiple answers were allowed). Most had not previously been taught about animal welfare in school (69%, n = 292), though all but 27 had previous knowledge of farm animal welfare; television was the most common source (70%, n = 276) and friends the least cited (13%, n = 53).

In terms of the wider UK population, in 2010 80% of the total population were reported to live in urban areas (Central Intelligence Agency, 2010), and among individuals aged between 14 and 15 there was a reported sex ratio of 1 female to 1.05 males (Office for National Statistics, 2010). In 2011, 46% of UK households owned at least one pet (Pet Food Manufacturers Association, 2011), and in 2008 8% of the UK population were either

completely or partially vegetarian (GfK Social Research, 2009). The study sample here appears to have a gender and potential pet ownership bias when compared with the wider population; however, with regards to pet ownership, the statistic quoted (46%) refers to all households inclusively as opposed to only those households with adolescents, which may at least partly explain this difference. Murray, Browne, Roberts, Whitmarsh and Gruffydd-Jones (2010), for example, found a significant interaction between dog ownership and the presence of children aged 11 to 15 years in a household, and also that households with both a dog and children of the same age range were more likely to own a cat than those without either dogs or children of a similar age.

Statistical Analysis

Prior to analysis, the following data calculations were conducted:

1. AFAWS 1-7 Likert scale statements were re-coded (and reverse coded where necessary) such that the most 'welfare positive' choice was assigned +3 points and the least -3 points, neutral scoring zero. An 'overall AFAWS score' from -3 to +3 was then calculated for each respondent by summing all 28 statements and dividing by the number of statements, repeated for each theme to obtain 'theme scores' from -3 to +3 (continuous scale, normal data). Each statement pair, and group of statements within each theme, had to meet an internal consistency of Cronbach's $\alpha > 0.7$, checked post data collection with unreliable statements excluded as necessary.
2. For the theory of planned behaviour data, statements were reverse coded where necessary. Choices most promoting the intention of adolescents to identify the welfare standards of their food were assigned seven points and the least one point. To standardize construct scores (1 to 7), each construct (behavioural intention, perceived behavioural control, etc.) score was quantified by summing all relevant statements into a single score and dividing this sum by the total number of statements for that construct across constructs: 7 representing a positive response, 4 indifferent, and 1 negative. Cronbach's alphas were calculated for statements within constructs.

All data were analysed using SPSS Statistics 17.0 (SPSS Inc), with a two-tailed significance of $P < 0.05$. Where data did not conform to assumptions of parametric testing, non-

parametric analyses were used. Where necessary, *P*-values were corrected for multiple testing using the Bonferroni correction. The unit of analysis was a single survey respondent. Analysis was conducted in the following stages:

Beliefs

Belief section data were viewed graphically and Friedman tests were used to determine differences between: (a) the welfare status rank assigned to six farm species; and (b) the rank assigned to six stakeholders for their responsibility to improve farm animal welfare. Post-hoc Wilcoxon tests used where appropriate.

Knowledge

Pair-wise McNemar's tests were used to assess which questions the adolescents were more likely to answer correctly. Mann-Whitney U tests were conducted to examine the effects of demographic variables gender (male / female) and area of residence (urban / rural). Insufficient variation within the sample meant the effects of pet ownership and diet could not be examined.

Attitudes

A General Linear Model was used to examine the effects of gender and area of residence (as fixed effects) on Attitude Score (continuous dependent variable). Friedman tests (and post-hoc Wilcoxon tests) were used to compare scores allocated to the four AFAWS themes (pain and suffering, space / behavioural freedom, responsibility / ability to improve, and importance of farm animal welfare).

Behavioural Intention

Friedman tests were used to compare the four theory of planned behaviour construct scores (attitude towards the behaviour, subjective norm, perceived behavioural control and behavioural intention).

Does the theory of planned behavior and gender, area of residence, knowledge and/or attitude contribute to variability in behavioural intention?

A three-step hierarchical multiple regression analysis was conducted to determine whether demographic factors (gender and area of residence), AFAWS score (split by theme) and knowledge score predicted behavioral intention beyond prediction engendered by the theory of planned behaviour constructs alone (Figure 1). With behavioural intention as the dependent variable, attitude towards the behaviour, subjective norm and perceived behavioural control were entered as the first step in the hierarchy (the basic theory of planned behaviour framework). Gender (female / male) and area of residence (urban / rural) were entered second, and AFAWS theme scores and total knowledge score entered lastly as independent variables. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity and homoscedasticity, and to determine a good fit of the model. Pearson and Spearman's correlations (depending on normality) were used to examine the connections between the three theory (of planned behaviour) constructs. Correlations of less than 0.3, even when significant, were deemed negligible and so only correlations ≥ 0.3 were considered relevant to this study (Ajzen & Fishbein, 1980).

Results

Beliefs

There was a statistically significant difference in ranking allocation of welfare status, from best (1) to worst (6), across the six farm species by adolescents (Figure 2; Friedman: χ^2 (5, n = 423) = 602.07, $P < 0.001$). The relative welfare of sheep and dairy cows was considered as > beef cattle and pigs > laying chickens > broiler chickens.

[Figure 2 here]

Responsibility for improving farm animal welfare attributed to UK stakeholder groups by adolescents is shown in Figure 3, with a statistically significant difference in rank allocation across groups (Friedman: χ^2 (5, n = 423) = 566.544, $P < 0.001$). The relative responsibility of

farmers was considered as > Government > charities, supermarkets and the General Public ≥ veterinarians.

[Figure 3 here]

Overall, adolescents cared about how farm animals are kept and treated (64.5% caring either very much or quite a lot) and many were concerned about this (49.4% either very concerned or quite concerned). Although the majority (71.6%) felt they knew some to a fair bit about farm animal husbandry, a large proportion (38.3%) felt that they did not know enough to give an opinion on their concerns. Most (70.4%) considered that there was not enough information on farm animal welfare available to them.

Knowledge

Out of a maximum total score of 7, 23.2% of adolescents scored 0, 33.6% scored 1, 26.2% scored 2, 12.8% scored 3, 3.3% scored 4, and 0.9% scored 5. No adolescent scored more than 5.

Adolescents were most likely to attempt answering questions relating to chickens, significantly more likely to be able to identify welfare problems for laying hens in battery systems (question one; 55.3% correct, $P < 0.001$ for all McNemar test comparisons), and significantly less likely ($P \leq 0.05$ for all comparisons) to demonstrate knowledge of problems for dairy cows and sheep (questions five and six; 13% and 6.6% correct, respectively) or to choose the correct option for the definition of an 'outdoor reared' pig (question four; 9.9% correct). Nearly all (93.4%) failed to identify labels representative of welfare standards higher than the legal minimum (question 7). Though Freedom Foods (n = 347) and Soil Association Organic (n = 288) were most frequently chosen as representative of higher animal welfare standards, as adolescents often additionally ticked an incorrect response, such as Assured Food Standards (n = 261), it was not possible to determine whether the high selection of the correct labels was based on knowledge or an artifact of randomly selecting multiple options.

Adolescents living in rural areas (Median *Md*, Inter quartile range IQR, of scores out of 7: 1.00, 1.00 – 2.00) scored significantly higher for knowledge than those living in urban areas

(*Md*, IQR: 1.00, 0.00 – 2.00; Mann-Whitney *U* test: $U = 17393.5$, $z = -2.234$, $P = 0.025$, r = -0.11). Females (*Md*, IQR: 1.00, 1.00 - 2.00) scored significantly higher for knowledge than males (*Md*, IQR: 1.00, 0.00 - 2.00; $U = 18081.0$, $z = -3.208$, $P = 0.001$, r = -0.16).

Attitudes

The AFAWS showed high internal consistency, indicating that the statements and themes within the scale measured a single underlying construct (i.e. attitude towards farm animal welfare as defined); overall Cronbach's α score of 0.93, and all attitude statement pairs and individual themes met the reliability and consistency criteria of $\alpha > 0.7$: pain and suffering 0.863; space / behavioural freedom 0.813; responsibility / ability 0.811; importance of farm animal welfare 0.79, suggesting adolescents were responding consistently within these groups of paired statements.

Adolescents achieved a total mean ± SE AFAWS score of 1.13 ± 0.04; tending towards the positive end of the scale (maximum 3, minimum -3). Scores varied significantly by gender; females scoring higher than males (Univariate General Linear Model: $F_{1, 419} = 33.976$, $P < 0.001$; female: mean ± SE: 1.37 ± 0.057; male: mean ± SE: 0.85 ± 0.060). Area of residence had no effect on total AFAWS score (Univariate General Linear Model: $F_{1, 419} = 2.474$, $P = 0.116$; urban: mean ± SE: 1.04 ± 0.051; rural: mean ± SE: 1.18 ± 0.073).

Scores were significantly different across AFAWS themes (Friedman: χ^2 (3, n = 423) = 703.80, $P < 0.001$), with significant differences between all pairwise theme comparisons (Wilcoxon: $P < 0.001$ for all). Most positive attitude was attributed to minimizing pain and suffering for farm animals, and least was indicated towards respondent responsibility / ability to effect change with regards to farm animal welfare (Figure 4).

[Figure 4 here]

Behavioural Intention

Each construct of the theory of planned behaviour met Cronbach's α reliability of > 0.7, except for subjective norm (attitude towards the behaviour 0.869, subjective norm 0.580,

perceived behavioural control 0.716, and behavioural intention 0.789); the results concerning this construct should therefore be treated with caution.

Overall and out of a maximum total score of 7 (most positive) per construct, median (IQR; Min to Max) scores were: attitude towards the behaviour 5.60 (4.80 – 6.40; 1 – 7); subjective norm 3.67 (2.67 – 4.33; 1 – 7); perceived behavioural control 3.67 (3.00 – 4.33; 1.17 – 6.83); behavioural intention 4.00 (3.25 – 5.00; 1 – 7). Scores were significantly different across constructs (Friedman: χ^2 (3, n = 423) = 571.625, $P < 0.001$), with all comparisons significant (Wilcoxon: $P < 0.001$ for all), except for perceived behavioural control compared with subjective norm (Wilcoxon: Z = -1.44, $P = 0.151$). Most positive responses were attributed to adolescents' attitudes towards the behavioural intention in question (to identify the welfare standards of their food), in terms of its importance, interest, usefulness, worthiness and an overall evaluation. Adolescents tended to respond most negatively when they considered the extent to which they felt they could engage with — and be able to perform — the behaviour (perceived behavioural control) and the extent to which they perceived that others want them to perform the behaviour (subjective norms). The overall behavioural intention score of 4 out of 7 suggests adolescents held an uncertain middle-ground opinion on the likelihood of trying to identify the welfare standards of their food either currently or in the future.

Does the theory of planned behavior predict adolescents' behavioural intention?

In the first regression step, attitude towards the behaviour ($\beta = 0.454$, $P < 0.001$), subjective norm ($\beta = 0.332$, $P < 0.001$) and perceived behavioural control ($\beta = 0.160$, $P < 0.001$) significantly predicted 49% of the variation in behavioural intention ($P < 0.001$). Thus the constructs of the theory of planned behaviour predicted adolescents' intentions to identify the welfare standards of the food that they consume.

Does gender, area of residence, knowledge and/or attitude contribute to variability in behavioural intention?

In step 2, inclusion of gender ($\beta = 0.138$, $P < 0.001$) significantly improved the model such that overall it predicted 51% of variation in behavioural intention (R squared change = 0.019, F change (2, 417) = 8.378, $P < 0.001$). Attitude towards the behaviour ($\beta = 0.230$, $P < 0.001$),

subjective norm ($\beta = 0.274$, $P < 0.001$) and perceived behavioural control ($\beta = 0.149$, $P < 0.001$) continued to contribute significantly.

In step 3, AFAWS theme scores and total knowledge score were added as explanatory variables, subsequently increasing the total amount of variation in behavioural intention explained by the model to 60% (R squared change = 0.089, F change (5, 412) = 18.51, $P < 0.001$). In this final model, whether an individual lived in an urban or rural setting (area of residence) and how important they felt it was for farm animals to be provided with adequate space and behavioural freedom and be free from pain, regardless of the effect this may have had on product prices (AFAWS themes 'pain and suffering' and 'space / behavioural freedom') did not explain the variation in behavioural intention; significant and non-significant relationships, including correlations between the theory of planned behaviour constructs, are shown in Figure 5.

[Figure 5 here]

The theory of planned behaviour constructs 'attitude towards the behaviour' and 'subjective norm' and the AFAWS themes 'responsibility / ability' and 'importance of farm animal welfare' had the greatest influence on intention; in all cases the relationship was positive, i.e. individuals who perceived that: (a) they could engage with — and were able to perform — the behaviour; (b) others wanted them to perform the behaviour; (c) they were responsible for and able to improve farm animal welfare; and (d) it was an important issue; had a more positive intention to identify the welfare standards of the food they consume. Females and those with knowledge of farm animal welfare were more likely to score highly on the behavioural intent measure. However, in comparison with other significant factors, gender and knowledge only contributed slightly to the overall variation in behavioural intention.

Discussion

The role of consumers for promoting animal welfare

Farm animal welfare is increasingly being seen as an important and concerning issue throughout Europe and the developing world (Commission, 2007; Kjaernes, 2007; Mayfield,

453 Bennett, Tranter & Wooldridge, 2007). A strong interest in the potential of individuals as
454 consumers to collectively improve farm animal welfare through their purchasing decisions
455 has long been known (e.g. Bennett, 1996) and continues to be apparent in recent literature
456 (e.g. Evans, 2007; Harper, 2001; Project, 2007). We (the authors) feel this is important but
457 emphasise that it is but one lever. Miele and Bock (2007) reviewed a number of papers
458 discussing the variability within individual concepts of farm animal welfare, and the
459 developing ambivalence towards livestock farming. Consumers do vary in their
460 understanding of the role and potential power which they hold as consumers and a
461 discrepancy exists between their concerns, willingness to pay and what is actually reflected in
462 market statistics (e.g. Harper & Henson, 2001; Mayfield, Bennett, Tranter & Wooldridge,
463 2007); thus, they may be too diffuse a group to exercise a coherent and identifiable influence.
464 As such, a current debate exists as to who should support animal welfare, with another sub-
465 set of literature instead focusing on different levers, or a combination of such: influencing
466 government directly so that certain improvements happen as a consequence of legislation
467 (e.g. banning of sow stalls in UK in 1999); changes at the level of food retailers, so restricting
468 the decisions and responsibilities which need to be undertaken by individuals as consumers
469 (e.g. FAWC, 2005; FAWC 2011b; IGD, 2007; Jacobsen & Dulsrud, 2007; Köhler &
470 Wickenhäuser, 2001; Ransom, 2007). However, even governmental decisions tend to be
471 strongly influenced by consumer attitudes; indeed, in recent years campaigning organisations
472 like CIWF, while keeping up the pressure on governments, have put increased effort into
473 lobbying supermarkets to change their practices directly (i.e. independent of legislation) as a
474 result of consumer preferences (e.g. Brooke, 2008).
475
476 Despite the current debate on the exact role of individuals (either as consumers or citizens)
477 for promoting farm animal welfare, on the premise that there is some potential for consumers
478 to influence farm animal welfare, this study, to our knowledge the first of its scale and in this
479 age group, examined relevant views of UK adolescents, as future consumers. The aim was to
480 provide a benchmark of current beliefs, attitude, knowledge and behavioural intention in
481 adolescents. Results are based on an opportunistic and reasonably random sample: over 51
482 schools were represented and the resulting student demographics appear comparable with the
483 UK population. However, a small sample size (relative to the size of the population) and a
484 slight gender bias (with an over-representation of females) are apparent, so caution in
485 interpreting and generalizing the results should be exercised. Gender is commonly found to
486 impact upon survey response rate, women responding in greater proportions than men

regardless of topic (e.g. Porter & Whitcomb, 2005). This common bias may have been heightened here as a result of the topic involved being related to animal welfare; females are often found to be more sensitive and empathetic toward animal issues (e.g. Herzog, 2007; Phillips & McCulloch, 2005) and so may have been more receptive and persistent with regards to completion of the survey.

It was important to measure all relevant aspects with the same sample so that relationships between variables could be examined. While reducing the survey's length might have improved response rate, data comprehensiveness would have been lost. Rigorous screening reduced the sample size even further but ensured that the sample was of the highest quality, thus enabling the authors more confidently to draw valid conclusions. Novel assessment tools to address the deficit of robust and relevant tools yielded results aligned with similar conclusions to those of studies with adult consumers.

Demographic influence

Greater empathy and concern for general animal welfare issues, and specifically farmed animals' welfare has been reported in females than males (e.g. Heleski & et al., 2006; Herzog, Betchart and Pittman, 1991; Herzog, 2007; Phillips & et al., 2011). Here, gender effects were also found on all main outcomes: females had more positive attitudes to — and knowledge of — farm animal welfare, and had greater intention to identify the welfare standards of the food which they consume. Other than for knowledge, for which the effect size was comparatively small (Cohen, 1988) and scores were low overall, there was no effect of residence for any outcome. This is not necessarily surprising. Though there is literature to support such a difference, and intuitively it is expected that those rural individuals who are closer to farm production would show more awareness of the issues than urban residents (Fuller, 1999; Harper & Henson, 2001), differences resulting from origin of residence were not always pronounced or in the expected direction (e.g. Miele, 2010; Schroder & McEachern; 2004). For example, Vanhonacker & et al. (2007) found that experience of farming, but not the living environment resulted in pronounced differences in how Flemish respondents evaluated the current state and importance of animal welfare in Flanders. Schroder and McEachern (2004) found that poor knowledge of labeling indicating production systems, coupled with little desire to choose knowledgably and a clear profession of caring about animal welfare were characteristic of both urban and rural adults. Very few studies

521 have addressed the influence of an urban / rural residence in children (see Muldoon,
522 Williams, Lawrence, Lakestani and Currie, 2009).
523
524 Current and childhood pet ownership has been shown to affect attitudes to animals, most
525 commonly in a positive sense (e.g. Paul & Serpell, 1993; Prokop & Tunnicliffe, 2010), and
526 dietary choices, including avoidance of certain animal products, may be attributed to an
527 underlying concern for animal welfare and rights or a more detailed level of understanding
528 about farming issues (e.g. Izmirli & Phillips, 2011; Miele, 2010). Unfortunately within our
529 sample we were not able to address such considerations; however, future work should
530 consider their significance.
531
532 *Adolescent beliefs and knowledge about farm animal welfare*
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534 As with adults, adolescents have little awareness of welfare problems for farm animals and a
535 poor ability to recognise product labels representative of animal welfare standards above the
536 legal minimum (European Commission, 2005; Miele, 2010). Inferences about knowledge
537 partially depend on the perception of a question's difficulty; however, five of the questions
538 simply required suggestions of a species-relevant welfare problem rather than detailed
539 knowledge or explanation. Poor knowledge means consumers may associate high welfare
540 standards with inappropriate indicators and market choices may be incongruent with
541 concerns.
542
543 Adolescents were more able to suggest a welfare problem for chickens than for any other
544 species. Constraints on questionnaire design prevented formal discrimination between
545 questionnaire fatigue and species-specific knowledge (e.g. the question order did not change).
546 Nevertheless, the presence of answers stating *"don't know"* or that species such as the dairy
547 cow *"don't have problems"* and the absence of blank responses suggest that fatigue was not
548 an issue. Our findings also correspond with adult knowledge and the effects of television
549 campaigns, e.g. 'The Big Food Fight' (broadcast January 2008, Channel 4) and Chicken Out
550 campaign (http://www.chickenout.tv/). Mass media influences adult consumers (Mayfield &
551 et al., 2007; Miele, 2010) and television was the most common farm animal welfare
552 information source cited by adolescents. As with adults, adolescents perceived broiler
553 chickens to have the worst welfare in the UK and sheep and dairy cows to have the best (e.g.
554 European Commission, 2005; Heleski & et al., 2006; Mayfield & et al., 2007). Their ranking

555 may also be affected by (a) the perceived distancing of dairy cows and to a lesser extent
556 sheep production from slaughter — often a main welfare concern of adult consumers (Welfare
557 Quality Project, 2007b); and (b) space allowance and outdoor access — two tangible
558 production features and areas of concern from a societal and consumer perspective (e.g.
559 Miele & et al., 2011). The latter aspect was reflected in adolescents' answers; for species-
560 specific welfare problems sheep and dairy cows were considered as *"fine"* or "*they have*
561 *space"*.
562
563 *Do adolescents care about and take responsibility for farm animal welfare?*
564
565 High total scores on the AFAWS characterise individuals who think that: (a) it is important
566 that farm animals are provided with adequate space and behavioural freedom (space /
567 behavioural freedom), and are free from pain regardless of any effects this may have on
568 product prices (pain and suffering); (b) farm animal welfare is an important issue with farm
569 animals not simply being a means to consumption (importance of farm animal welfare); and
570 (c) it is their responsibility to take action which can have a positive effect on farm animal
571 welfare (responsibility / ability).
572
573 Adolescents scored the AFAWS themes positively, suggesting a positive attitude to farm
574 animal welfare in line with previous findings (DeRosa, 1987; Jamieson & et al., 2012).
575 However, both low AFAWS theme responsibility / ability scores and beliefs findings suggest
576 that adolescents perceived minimal personal responsibility to improve farm animal welfare
577 and a poor ability to make changes through choices. This finding is similar to adults where
578 concern and placement of importance does not definitively mean that consumers believe that
579 their voice as a consumer counts, and that they will act to support their beliefs, or feel or want
580 responsibility for affecting welfare standards through their purchases; a common preference
581 exists for responsibility to be delegated and enforced at a higher level, with personal choice
582 within consumption removed (e.g. Mayfield & et al., 2007; McEachern & Schröder, 2002;
583 Schröder & McEachern, 2004). In this study, the Government was ranked highly in terms of
584 responsibility, reflective of adult beliefs and UK practice where legislation is usually the
585 main tool by which minimum welfare standards are imposed (Bennett, 1997).
586
587 *Are adolescents willing and able to identify welfare standards?*
588

589 To the authors' knowledge, this is the first study to use the theory of planned behaviour to
590 assess those factors which are important in predicting adolescents' intentions to identify the
591 welfare standards of their food. A mean behavioural intention score of 4 (out of 7) indicates
592 neither a positive nor a negative intention. Measures were based on self-report and are
593 vulnerable to self-presentation bias, yet adolescents' concerns for farm animal treatment
594 (beliefs) and attribution of importance to the issue of farm animal welfare in general
595 (AFAWS) were mirrored in their positive attitude towards identifying the welfare standards
596 of their food; they tended to agree that this behaviour was both important and interesting
597 (attitude towards the behaviour). However, they disagreed that they would be able to carry
598 out the behaviour (perceived behavioural control) or that others thought that they should be
599 able to (subjective norm).
600
601 *How intentions might be encouraged*
602
603 Current educational materials and strategies aim to develop an understanding that sentient
604 animals feel pain and hence suffer and so should be treated with respect. Our results suggest
605 that adolescents are aware of this and do not dispute its importance. Although it is
606 encouraging that AFAWS total scores were towards the positive, even a knowledgeable and
607 interested individual who feels that an issue is outside of their responsibility or capability is
608 likely to remain impotent. A weak belief in individual influence has been suggested as one
609 mechanism acting to reduce any guilt associated with meat consumption, and may explain the
610 discrepancy between expressed concern and consumer choices in adults (e.g. Harper &
611 Henson, 2001). Such barriers need to be altered if the intention is to increase the likelihood of
612 welfare-enhancing behaviours being performed.
613
614 Adolescents should be able to differentiate between products to express a preference for
615 higher standards of animal welfare (traditional education to increase knowledge) and obtain
616 an element of satisfaction in their choice to sustain this behaviour. As with European adults,
617 adolescents felt that not enough information is available to them on the subject of farm
618 animal welfare (European Commission, 2007; Harper & Henson, 2001), and a large
619 proportion (38.3%) felt that they were not well informed about farm animal welfare issues
620 (cf. Mayfield & et al. (2007); a similar percentage of British consumers did not feel as well
621 informed about animal welfare issues as they should be.
622

However, provision of further information is not necessarily a solution if it does not directly translate to knowledge. Consumers may choose voluntary ignorance and actively avoid detailed information so as to remove themselves from accepting responsibility for farm animal welfare, thus reducing discomfort where choices necessitate (e.g. those based on cost as opposed to ethical considerations) or where current beliefs and practices do not match new concerns, interpretation or knowledge offered from further information (Festinger, 1957; Mayfield & et al., 2007; Te Velde & et al., 2002). As Miele and Evans (2010) point out, information provision in the form of welfare labeling, can create two groups, i.e. ethically competent and incompetent consumers. The latter group does not engage with information and may not have the competence or inclination to accept responsibility for farm animal welfare, a concern mirrored in Köhler and Wickenhäuser (2001). In the current study, adolescents' low awareness of welfare issues may be the result of deliberate, functional ignorance if the cost of processing the information involved, both cognitively and physically, outweighed the perceived benefit. Interestingly, high scores attributed to the animal-based themes within the AFAWS ('pain and suffering' and 'space / behavioural freedom') were not reflected in behavioural intention, potentially as a result of adolescents suppressing these concerns when faced with conflict regarding their current food choices. Though not highly concerning in terms of immediate effect on the market, if such disengagement persists within adolescents, their future behaviour will not reflect concerns and importance currently attributed to farm animal welfare. Education to enhance knowledge or other ways of information transfer, without also facilitating moral engagement and an increased sense of competency, may also be ignored. If the intention is for adolescents to engage with farm animal welfare and any improvements in information provisions, it is desirable for them to develop into information-seeking competent consumers.

Transformative education to address cultural attitudes, values and beliefs surrounding a set of behaviors may motivate change by changing the culture itself. Variation in social influence has been shown to affect behaviour with regards to drinking and smoking (Russell-Bennett & Golledge, 2009; Lotrean, Dijk, Mesters, Ionut & De Vries, 2010). Creating a peer environment and social culture where expressing support for farm animal welfare is seen as the preferable response may increase the number of adolescents making the effort to identify the welfare standards of food and empower them to claim more responsibility. Further work is needed to address the potential of such a solution. However, the current similarities with

discussions within both the alcohol-use and smoking literature suggest that these findings may have value across a wider subject area.

Conclusions

These findings contribute to two areas of literature. First, as primarily an information-seeking survey, they add to the growing literature on human-animal interactions by exploring a previously un-represented issue. Secondly, this study takes the view that adolescents, as future consumers, have the potential to affect farm animal welfare standards. As such, it contributes to literature exploring the conditions required for consumers to make informed and ethically guided decisions which match their allocations of importance and concern towards farm animal welfare.

Adolescents are not immediate, large-scale consumers, but are at a stage in their lives when they are increasingly beginning to make consumer choices. Though firm conclusions cannot be drawn on the generalization of this study to the wider adolescent population, the results indicate that within the sample here adolescents have limited knowledge of welfare problems of farm animals and welfare relevant product labels but know most about chickens, perhaps due to their prominence in the media. They seem to care about farm animal welfare but are less aware of their power as consumers, and currently do not have either a positive or a negative intention to identify the welfare standards of their food.

Presently, adolescents have the characteristics more typical of 'ethically incompetent consumers', manifesting little inclination to seek information on — or accept responsibility for — farm animal welfare and little confidence in their capacity to engage with information regarding the treatment of farm animals. Thus, their interest and concern in welfare as a quality of food, whilst important to maintain, was not reflected in the questions they might ask and thus their considerations in future choices.

To resolve this discrepancy, adolescents should be enabled to become aware of their potential power to raise welfare standards and be equipped with the necessary knowledge and information by which to make and evaluate their decisions. However, though information provision in the form of education may enhance adolescents' knowledge of welfare problems and their ability to identify welfare relevant product labels, it may not positively impact on

the wider findings. Barriers such as disassociation, voluntary ignorance and perceived lack of personal influence are difficult to tackle, especially with physical separation of livestock production and consumption and active avoidance of connecting the two. Increasing information can even exacerbate the situation if adolescents do not feel it can easily be incorporated into usual practice. Similarities between the sample here and the wider adult population discussed suggest that instead a multi-faceted approach is required, including research to determine the most effective means by which to provide adolescents with, and empower them to request and use the information they will need to develop into ethically competent consumers able to identify and engage with developments in the field of farm animal welfare, if this is the preferred outcome.

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Tables and Figures

Figure 1: The extended model used in the prediction of specific behavioural intentions. Non-shaded boxes represent the theory of planned behaviour (Ajzen, 1991). Shaded boxes are factors additional to the original model: Attitude to farm animal welfare scale (AFAWS) themes, Demographics and Knowledge (of welfare issues for six different farm species and of welfare standard labelling). Arrows indicate predicted direction of relationships.

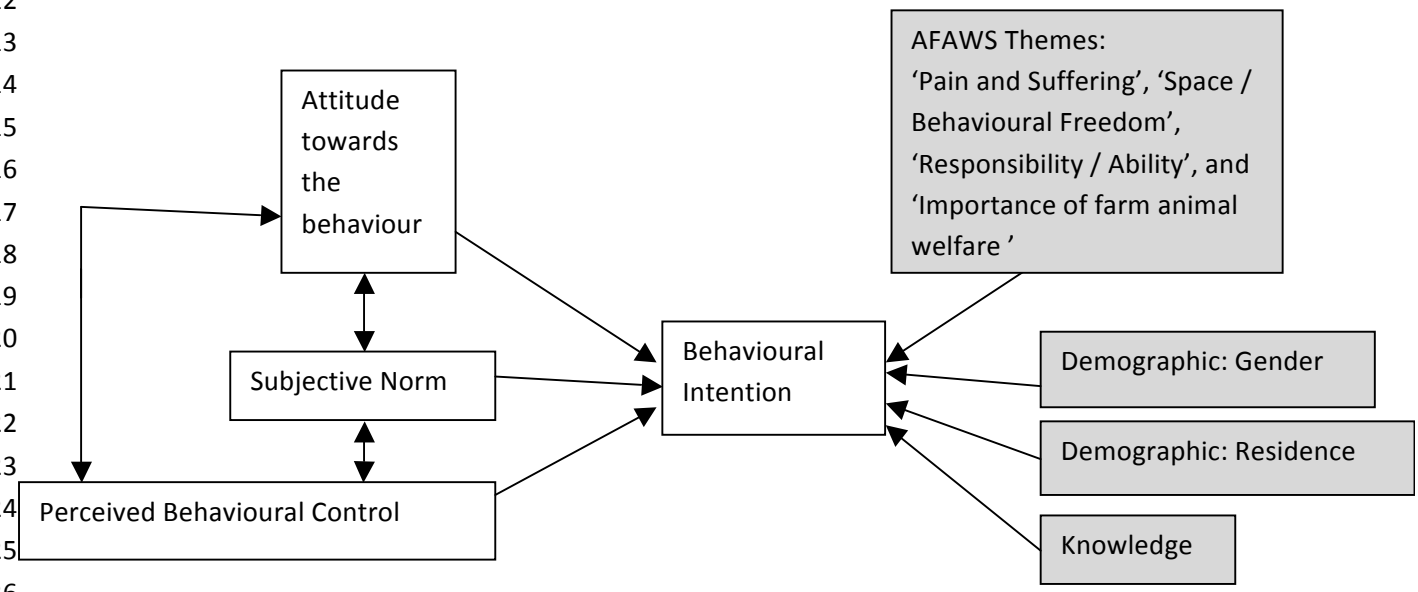


Figure 2: Distribution of adolescents' (n = 423) ranking of six UK farm animal species according to best (1) to worst (6) perceived welfare. Bubble size at each rank value (X-axis) represents the proportion of the sample choosing the particular rank for the relevant species (Y-axis). Differing superscripts indicate significant differences between species (Y-axis; $P < 0.05$). Vertical black lines indicate the median rank for each species (within row).

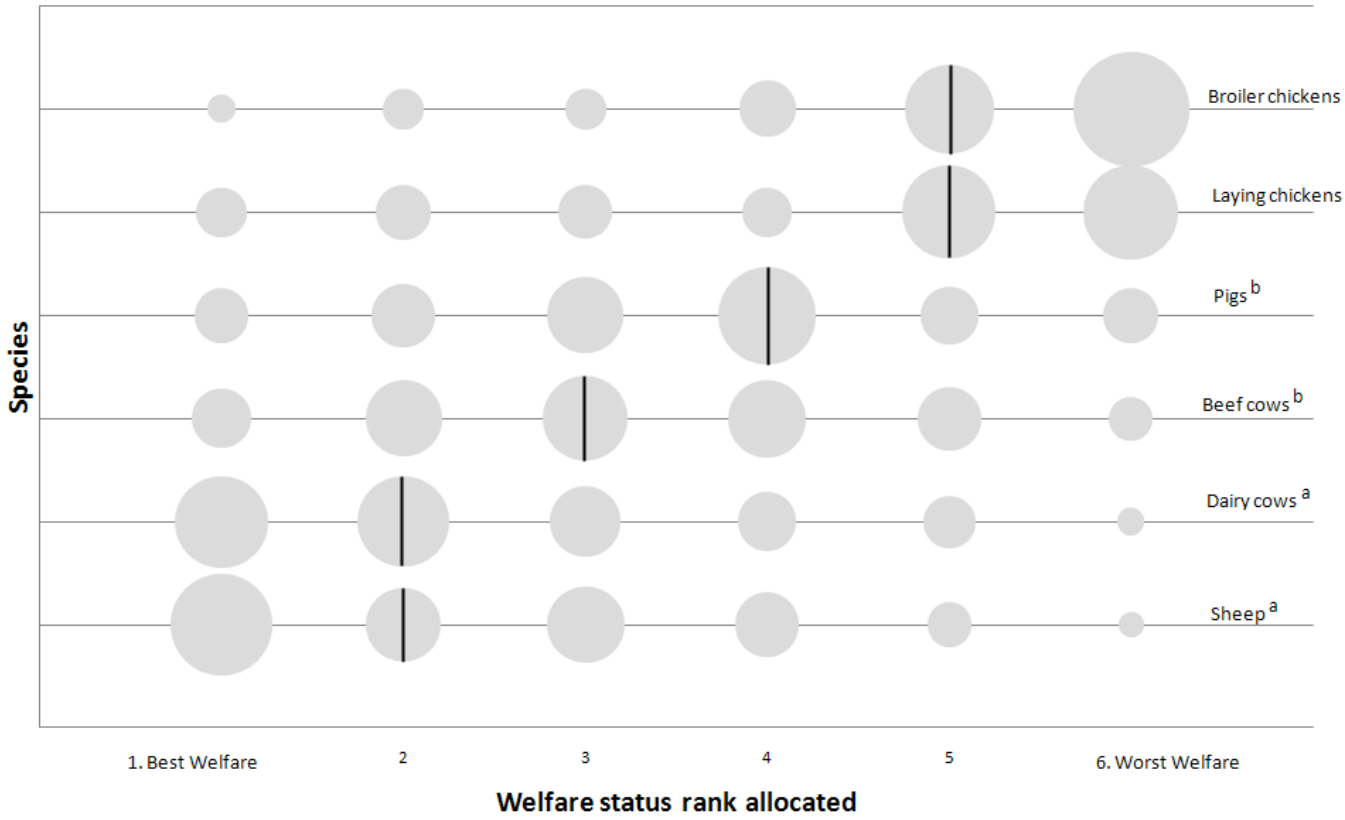


Figure 3: Distribution of adolescents' (n = 423) ranking [most (1) to least (6)] of six groups' responsibilities for improving UK farm animal welfare. Bubble size at each rank value (X-axis) represents the proportion of the sample that chose the particular rank for the relevant species (Y-axis). Differing superscripts indicate significant differences between species (Y-axis; P < 0.05). Vertical black lines indicate the median rank for each group.

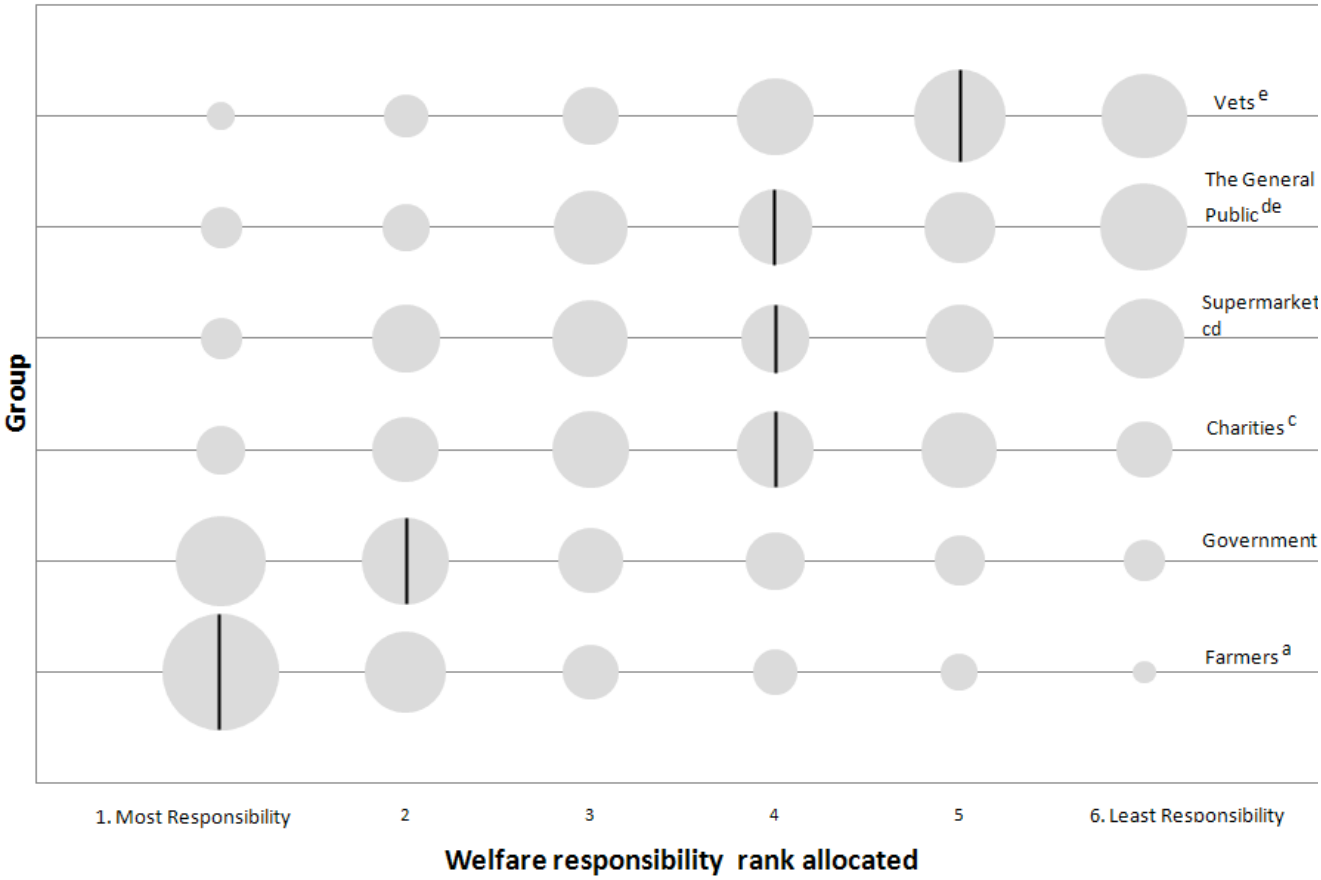


Figure 4: Adolescents' (N = 423) median, interquartile, max and min range for AFAWS Theme scores (Pain and Suffering, Space / Behavioural Freedom, Responsibility / Ability to improve, and Importance of farm animal welfare). Significant differences (Wilcoxon tests) indicated by asterices: * = $P < 0.05$, ** = $P < 0.01$, and *** = $P < 0.001$.

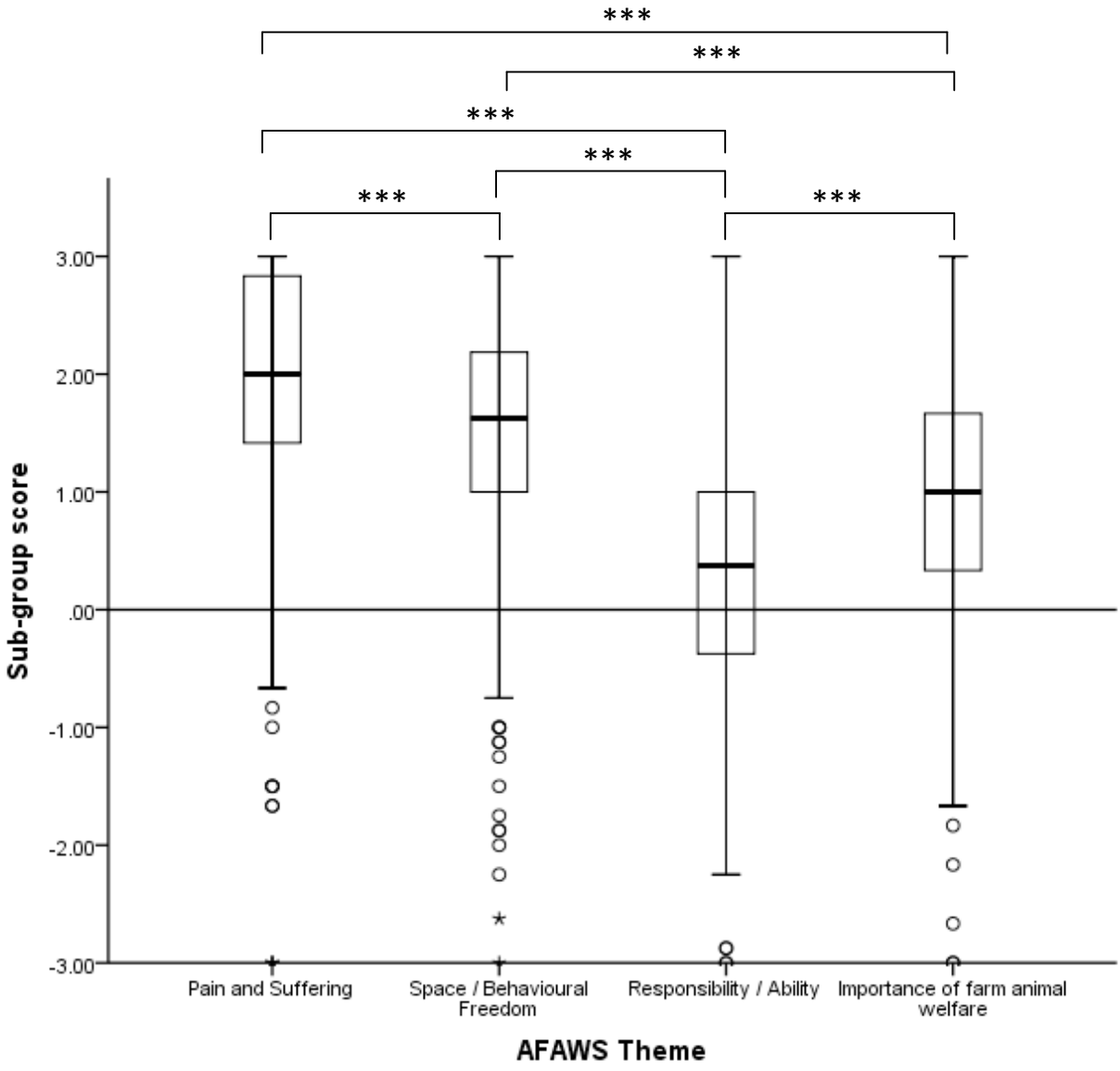
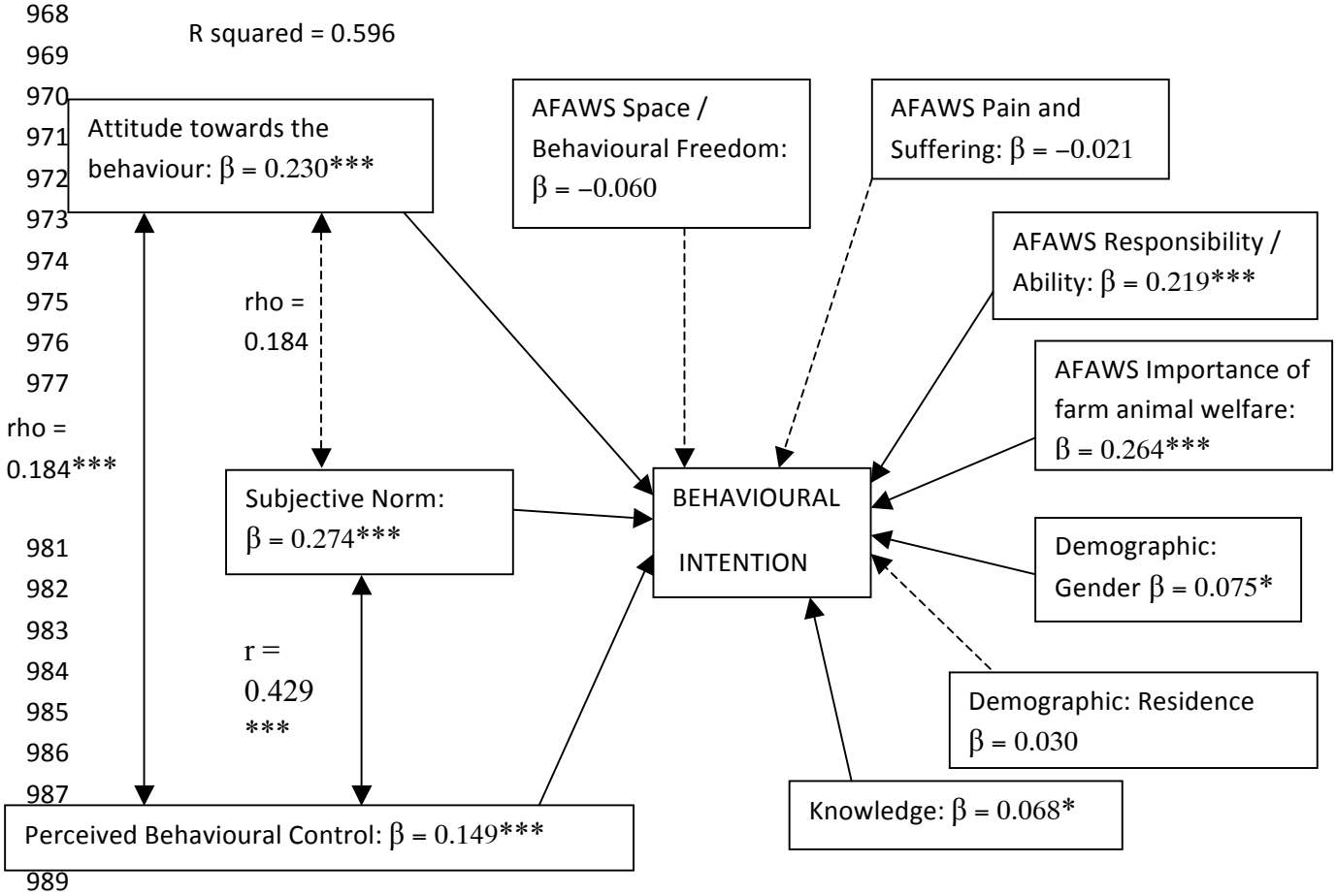


Figure 5: Model illustrating the variance in behavioural intention predicted by Attitude towards the behaviour, Subjective Norm, Perceived Behavioural Control, AFAWS themes, Knowledge and Demographic characteristics. Standardised regression weights from the multiple regression analysis (single-headed arrows) and correlations (double-headed arrows) between the elements of the Theory of Planned Behaviour. Solid arrows indicate statistically significant relationships, dashes indicate non-significant relationships. Significant relationships are indicated by asterices: * = *P* < 0.05, ** = *P* < 0.01, and * = *P* < 0.001.** [1]



[1] R squared provides an indicator of how well the model fits the data. r is the correlation coefficient from Spearman's test and rho the Pearson product moment correlation coefficient.

Appendices

Appendix 1: Response removal criteria; the following rules were used to determine which data were omitted from the final sample:

1. Inclusion of ridiculous and/or rude answers throughout the survey – e.g. respondent identification as a 301 year-old Yoda.
   These were removed as the extent of such answers rendered the majority of the data collected unreliable.
   53 students were removed based on this criterion.

2. Ticking the same response category to sections of questions, e.g. all 4s.
   These were removed as the adolescents had simply provided one answer to every question (including both knowledge questions and responses to a Likert scale), and so it was inferred that they had not given any thought to the questions asked but had simply ticked one response to get through the exercise quickly.
   115 students were removed based on this criterion.

3. Providing incomplete data sets both within questionnaire sections and across the questionnaire as a whole.
   These were removed as we wished to look for relationships between each section and could not do this with incomplete sets.
   311 students were removed based on this criterion.

4. Answering with a social desirability bias to social desirability statements, i.e. adolescents who strongly agreed to both statements 'I never get angry' and 'I have never even told a little lie', measured on a Likert scale from (strongly agree) 1 – 7 (strongly disagree).
   These were removed to account for the risk that questionnaire respondents would answer self-report questions or statements in a manner that they perceived would be viewed favorably by others rather than in a truthful manner (social desirability). Such a bias would interfere with interpreting the results. Though this reduced the number of students in the final sample, it makes the results more generalizable than if such a measure had not been included.
   110 students were removed based on this criterion.

5. Respondents showing unreliable responses for 5 or more out of the 14 statement pairs in the AFAWS section.
   Paired statements with one worded positively and the other negatively, using a Likert scale to measure responses, had been specifically chosen in order to check if adolescents were simply randomly ticking responses without reading the questions as they might then agree with two opposing statements. Where this occurred, i.e. students agreed with both of two contradictory statements within a pair, this pair was marked as an unreliable response, e.g. responding with a 7 (strongly agree) to both the statement "It doesn't

matter if a farm animal is in pain" and "It is important that farm animals are not in pain". The same was true of they disagreed with two contradictory statements in a pair. In addition where a student responded in a strongly positive manner to a statement or strongly negatively, but then responded with neither positive nor negative for the paired statement (4), this pair was marked as an unreliable response, e.g. a Likert scale response of 4 with either a '1' or a '7'.

262 students were removed based on this criterion.