

Public attitudes to the welfare of broiler chickens

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Abstract

This paper reports results from two workshops held in York, England that investigated public attitudes towards the welfare of broiler chickens. At the outset the majority of participants admitted that they knew little about how broiler chickens are reared and were shocked at some of the facts presented to them. Cognitive mapping and aspects of Q methodology were used to reveal the range of variables that participants believed affected chicken welfare, the causal relationships between those variables, and what variables were considered most and least important. While some participants focused on the importance of meeting basic needs such as access to food, water, light and ventilation, others highlighted the role of welfare regulations and public opinion. Factor analysis of the results from a ranking exercise identified two factor groups, 'Factor one; the bigger picture' and 'Factor two; basic animal needs'. The findings demonstrate that some members of the public are both interested in learning about how their food is produced and concerned about the conditions faced by broiler chickens. Some are able to see clear links between public opinion and the welfare of farm animals; an important connection if consumer behaviour is to contribute towards improving animal welfare.

Keywords: animal welfare, broiler chickens, cognitive mapping, England, public attitudes, Q methodology

Introduction

Consumer concerns about farm animal welfare have increased substantially in industrialised countries in recent decades (Moynagh, 2000; Harper & Henson 2001). During the same period the productivity of farm animals has also increased dramatically while, conversely, some aspects of health and welfare have decreased (Farm Animal Welfare Council [FAWC] 2001). For example, there is now greater prevalence of ascites and leg weakness in broiler chickens (see for example, Sørensen *et al* 2000). Much existing consumer concern about the welfare of poultry has focused on conditions faced by laying hens. However, this paper reports results from two workshops held in York, England that investigated public attitudes towards the welfare of broiler chickens (birds reared for meat). The workshops were conducted as part of a research project undertaken by SAC (Scottish Agricultural College) for Defra (Department for Environment, Food and Rural Affairs). The project formed part of a Regulatory Impact Assessment (RIA) of a proposed EU Commission directive aimed at improving the welfare of broilers, and also involved an economic valuation of the benefits that consumers perceive there to be in decreasing stocking density (McVittie *et al* 2005). Proposed legislation must undergo a RIA in order to establish whether benefits are likely to outweigh costs. This raises the question of who is likely to benefit from improved chicken welfare. The underlying assumption is presumably

that consumers want better welfare for farm animals and hence they would benefit from the proposal. The research reported here aimed to provide detailed understanding about the concerns that consumers have about the welfare of broiler chickens. Another objective was to discover the extent to which consumers are aware of welfare issues relating to broiler chickens as this is clearly important in trying to understand how much benefit they would derive from an improvement in the welfare of broilers.

Broiler chickens

Broiler chickens are those reared for meat production. Historically, chickens were kept for a few years for egg production, and then eaten at the end of their useful laying life. However, from the mid-twentieth century birds began to be selected either for laying high numbers of eggs, or for producing greater muscle mass (and thus meat). Chickens now grow from 45 g at one-day old to a slaughter weight of 2.2 kg by 42–45 days, approximately half the time it took 50 years ago.

Broilers are reared on wood shaving litter floors in sheds housing up to 20,000 birds. The floor material is not changed during the six weeks of their life. Typically, the sheds are windowless and the environment is artificially controlled with heating and fresh air vents. Light is also artificially controlled. In the past broilers were typically given 23 hours of light in any 24 hour period but birds are now

given a longer, more natural dark period of about eight hours. Light intensity is kept low to reduce movement and therefore maximise weight gain. Broilers are provided with constant access to a high protein diet either supplied from feed hoppers (circular tubs that hang from the ceiling) or from feed tracks that run along the length of the house. Constant access to water is provided from nipple drinkers, which also run along the length of the house. Until recently, broilers were recommended to be stocked at 34 kg m⁻² — this is based on their final bodyweight, and is equivalent to about 15–16 chickens per square metre.

In early 2005 the European Union adopted a proposal for a Directive on the protection of broiler chickens. The Directive was proposed in response to concerns about the health and welfare shortcomings in the intensive farming of chickens and sets down a maximum stocking density as well as a number of minimum conditions to ensure adequate animal welfare. It is not clear, however, whether changing stocking density will improve bird welfare because evidence is contradictory. Results from a study by Dawkins *et al* (2004) showed that differences in other environmental conditions have more impact on welfare than stocking density alone. For this reason, the proposal also requires farmers to ensure appropriate access to litter, drinkers, feed and ventilation. Buildings must have a certain amount of light and there must be a minimum of two daily inspections. Any chickens that are seriously injured or in poor health must be treated or immediately culled. These minimum standards are supplemented by detailed record-keeping requirements on issues such as house temperatures, medical treatments administered, and mortality rates.

Consumer attitudes to animal welfare

During the last 20 years consumer groups, mostly in industrialised countries, have become increasingly interested in farm animal welfare. As consumers grow wealthier, and their access to an adequate quantity of food is largely guaranteed, attention turns to food quality. Such quality concerns focus on food safety, aesthetic attributes, methods of food production, and the impact that food production techniques have on the environment and animal welfare. These concerns can result in consumer demand for food that has been produced using certain production techniques that are perceived to be more environmentally friendly or to offer better animal welfare (Mitchell 2001). For example, research by Mintel (1999) found that 41% of meat purchasers noted concern about animal welfare, with 46% of those claiming that it influenced purchase decisions; that is, 19% of meat purchasers were influenced by welfare issues. However, in their study of 30 people in Scotland, McEachern and Schröder (2002) found during interviews that there was little concern for ethical issues relating to meat production. Price and product appearance were the primary meat selection criteria, the latter being used as an indicator of quality. Gaps were identified between stated attitudes and reported behaviour, mainly as a result of a lack of understanding regarding meat production. This raises issues about the need for better education of consumers

about meat production systems. In line with this, a Dutch study by Frewer *et al* (2005), aimed at understanding consumer attitudes towards systems of animal husbandry, found that participants thought about animal welfare in terms of animal health and the living environment, but did not think about welfare issues at a more detailed level. Hence, a lack of knowledge was inferred. Harper and Henson (2001) reported the results of a European project looking into consumer concerns about animal welfare and the impact on food choice. They found that consumers were concerned about animal welfare not only because of the impact on the animals but also because of a perceived impact on food safety, quality and healthiness. This suggests that people were able to see connections between animal welfare and food-related issues.

Attitudes to the welfare of broiler chickens

According to a European Commission report on broiler welfare (European Commission, Health & Consumer Protection Directorate-General 2000), consumer sensitivity to the welfare of broilers is less apparent than concerns about pigs and laying hens. They suggest a number of reasons for this. First, there is no clear image of poor welfare in relation to the rearing of broiler chickens, unlike in the case of laying hens where cages are a strong symbol for perceived poor welfare. Second, there is a general lack of information and an apparently limited knowledge about broiler rearing systems.

A study in Germany used focus groups to investigate consumer concerns about animal welfare and included work specifically on broiler chickens (Köhler 1999). They recorded that people “were shocked” when they saw the pictures of the barn production system for broilers, and thought it would provide poor animal welfare. Concerns were expressed about the fact that litter and bird droppings were not cleaned at all during the lifetime of the birds and that health problems might arise. They were concerned about the lack of fresh air in a controlled environment, and about the fact that it may be difficult for every broiler to get enough food and water. It was also anticipated that medical treatment of the birds would be difficult.

Cognitive mapping

The workshops organised for this project utilised aspects of two participatory methods of attitudinal investigation — cognitive mapping and Q methodology. Given the increasing importance of public participation in policy-making, the need for tools that can enable the social learning dimension of public participation is growing (Maurel 2003). Cognitive mapping is one such tool and can be described as qualitative models that portray how a given ‘system’ operates (Özesmi & Özesmi 2004). The qualitative model is derived by describing the ‘system’ in terms of its component variables and the causalities among them (Park & Kim 1995). Cognitive maps have been used in various fields, such as political science, international relations, electrical engineering, and medicine (Stach *et al* 2005). The term ‘cognitive maps’ was introduced by Axelrod in 1976,

who used signed graphs to model decision-making in social and political systems (Peláez & Bowles 1996). In simple cognitive maps, the relationships between variables are designed to show positive or negative causality. Cognitive maps are derived by asking participants to compile a list of variables or issues relating to the topic under consideration, and then to map those variables to indicate relationships between them. This can include an indication of the strength of the relationship as well as the direction. As the approach requires participants to derive their own variables relating to the topic under consideration it can be described as self-referent, or self-defining, hence the researcher has limited input in framing the issue. In the current project, cognitive maps served to elicit variables from participants that they considered to be relevant to the welfare of broiler chickens, and then to provide information about the relationships between those variables.

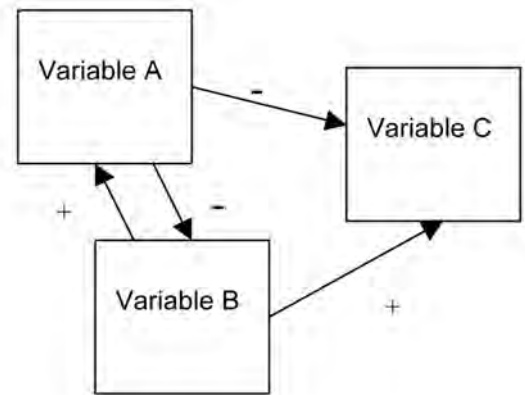
Q methodology

Another part of the workshops utilised aspects of Q methodology. Q methodology has traditionally been used in the discipline of psychology for identifying attitudes or 'discourses' and is now used widely across the social sciences (see for example, Walter 1997; Barry & Proops 1999; Swedeen 2006). The output from a Q method study is a number of factors or 'discourse groups' that describe the attitudes of the participants towards the subject area. The central part of Q method, which was utilised here, involves a process called 'Q sorting' and requires respondents to rank or 'sort' statements or items against a standard likert scale (strongly agree to strongly disagree, or something similar) in a forced, quasi-normal distribution. This restricts the number of items that can be placed at the extremes of the scale, thus forcing the participant to carefully identify those items about which they feel most strongly. In the next stage the sorts (statement rankings) are factor-analysed in order to reduce the data to a smaller number of typical sorts that represent attitude groups. The researcher must then interpret these typical sorts, based on which items elicit which response, and describe the discourse groups. Q methodology provided an opportunity to identify what people thought were the most and least important variables for broiler welfare and to assign participants to different attitude groups.

Materials and methods

The two workshops were held in 2005 with a total of 16 participants. To begin, participants completed a short questionnaire on chicken farming and their meat buying habits. An animal behaviour scientist then gave a presentation about broiler chicken production and participants were shown a number of typical broiler shed images. This presentation was designed to be factually accurate and provide a balanced view of broiler chicken living conditions. The talk and photographs were intended to provide a context for the group exercises that followed. For the workshop exercises participants were split into smaller groups, hence there were a total of six groups across the two workshops

Figure 1



Outline example of cognitive map.

(called groups 1A, 1B and 1C, and 2A, 2B and 2C). The first exercise involved the production of cognitive maps designed to encourage participants to think of variables affecting chicken welfare and then map the relationships between them. Participants were shown an example of a simple cognitive map and asked:

"If I mention chicken welfare (and remember that we're talking about chickens bred for meat production) what issues, factors, things, variables come to mind?"

Groups of participants were asked to produce a list of variables. Where prompts were needed, participants were encouraged to think about all stages of production and consumption and not just focus on what happens in the chicken shed. Participants were then asked to think about the relationships between those variables. Variables were written into boxes, and lines drawn between them to represent relationships. Lines were labelled with arrows to indicate the direction of the relationship, and positive or negative signs were added. This exercise sought to uncover peoples' awareness of welfare issues, and their understanding of the connections between different issues. Figure one is an outline example of a cognitive map.

The second exercise presented participants with 24 welfare variables derived from the literature. They were required to rank these variables against a five-point scale (most important to least important) to show what they perceived to be most and least important in affecting the welfare of broiler chickens. The ranking exercise was therefore designed to encourage participants to think about the relative importance of a range of issues that might impact on welfare. For this exercise each group of participants was given a template and a set of cards each featuring a specific issue (such as stocking density, access to light, character of farmer, public awareness of animal welfare issues, price of chicken, access to food and water etc). They were asked to place each card in a box on the template (ranking from most important to chicken welfare

Table 1 Workshop participants.

Factors	Workshop one	Workshop two	Total
<i>Gender</i>			
Female	4	5	9
Male	4	3	7
<i>Age group</i>			
30–39	3	3	6
40–49	3	2	5
50–59	2	3	5
<i>Socio-economic group</i>			
C1: Supervisory or clerical and junior managerial, administrative or professional	4	3	7
C2: Skilled manual workers	3	1	4
DE: Semi and unskilled manual workers/state pensioners or widows (no other earners), casual or lowest grade workers	–	4	4
AB: Higher managerial, administrative or professional/intermediate managerial, administrative or professional	1	–	1
<i>Highest educational qualification</i>			
GSCE/'O' Level (General Certificate of Secondary Education/Ordinary Level)	2	4	6
Vocational qualification eg NVQ (National Vocational Qualification)	3	2	5
Degree/HND (Higher National Diploma)/HNC (Higher National Certificate)	–	2	2
Not stated	2	–	2
None	1	–	1
<i>Living status</i>			
With other family members, including children under 16	4	4	8
With partner/spouse only	4	2	6
With other family members, none of whom are under 16	–	2	2

to least important to chicken welfare). The distribution of the cards was forced so that only a limited number of issues could be placed at the extremes.

The completed ranking templates are called ‘sorts’. The six sorts completed by participants at the two focus groups were analysed using PQ Method software (Schmolck 2002). This involves carrying out factor analysis and varimax rotation. The aim is to identify ‘family’ groups of sorts, and thereby reduce the number of sorts to a smaller number of typical or idealised factors.

Results and analysis

Introduction

Of the 16 people involved in the two workshops, there were more women (9) than men (7) and all were aged between 30 and 59 years of age. The majority were from socio-economic group C1 (ie lower middle class [supervisory or clerical, junior managerial, administrative or professional occupations]) and were educated to GCSE (General Certificate of Secondary Education)/O (Ordinary) level or NVQ (National Vocational Qualification) level. All lived with other family members, the majority having children under 16 (see Table 1).

When asked about their knowledge of broiler chicken farming the majority of participants (10) claimed to know ‘a little’. All participants stated that they ate chicken meat and were concerned about the welfare of farmed animals. When asked for unprompted factors that influenced their choice when buying chicken meat the most common factors were ‘quality/freshness’ and ‘price’, followed by ‘appearance’ and ‘how it is farmed/whether it is organically farmed’. However, when prompted with specific factors those most commonly indicated were ‘sell-by date’ and ‘appearance’, followed by ‘quality food labelling’ and ‘price’. Next, participants were asked the question: “Imagine you are given £10 a month that must be spent on food products that are farmed using better than average animal welfare standards. How would you spend it?” (more than one choice permitted). The most common response was chicken, followed by fish and eggs. It is probable that these responses were influenced by the topic of the workshop. Finally, respondents were asked if they could list any issues that they were particularly concerned about, related to how farmed chickens are treated. The most common issues were ‘battery rearing’ and ‘crowded conditions’. At this stage, the respondents did not seem to differentiate between battery and broiler chickens and the low overall level of responses confirms the self-reported low level of

Table 2 Variables thought to impact on chicken welfare in the chicken shed.

Variable	Grp 1A	Grp 1B	Grp 1C	Grp 2A	Grp 2B	Grp 2C	Total mentions
<i>Breeding and treatment</i>							9
Breeding of birds	X						
Breeding methods			X				
Use of steroids or drugs				X			
Growth rate of chickens			X				
Inhumane treatment				X			
Risk of infection or disease				X			
Sore feet/other diseases					X		
Dead chickens causing obstruction/spreading disease					X		
Pain/injury/disease	X						
<i>Space</i>							8
Space to move	X				X		
Space available in shed			X				
Amount of fighting/bullying/pecking	X						
Fear/distress—crowds of chickens		X					
Overcrowding						X	
Free range/space to move						X	
Stress/discomfort						X	
<i>Food</i>							7
Type of feed	X						
Quality of food		X		X	X		
Amount of food		X					
Stable diet						X	
Frequency of feeding			X				
<i>Temperature</i>							6
Heat of environment	X						
Temperature and humidity			X				
Temperature						X	
Ventilation					X		
Fresh air/ventilation						X	
<i>Water</i>							4
Access to water	X	X	X			X	
<i>Cleanliness</i>							4
Hygiene/state of litter	X						
Wood shavings/cleanliness of litter					X		
Cleanliness of shed		X					
Cleanliness of environment						X	
<i>General surroundings</i>							4
Housing of chickens						X	
Environment in chicken shed		X					
Unnatural environment				X			
Comfortable surroundings			X				
<i>Lighting</i>							3
Natural/artificial lighting	X						
Artificial lighting					X		
Balance between light and darkness		X					
Total							45

Table 3 Variables thought to impact on chicken welfare beyond the chicken shed.

Variable	Grp 1A	Grp 1B	Grp 1C	Grp 2A	Grp 2B	Grp 2C	Total mentions
<i>Supermarkets/products</i>							7
Supermarkets packaging demands	X						
Supermarket pricing demands	X						
Price of chickens				X			
Appearance of chickens in supermarkets		X					
Packaging of chickens			X				
Marketing methods		X					
Range of chicken products				X			
<i>Transportation</i>							6
Transportation method	X						
Transportation density	X						
Transportation		X	X			X	
Transportation to shed/slaughterhouse					X		
<i>Public opinion</i>							6
Public opinion on conditions	X						
People's opinions				X			
Public opinion						X	
Consumer demand					X	X	
People's ignorance of chicken welfare				X			
<i>Slaughter</i>							4
Distress prior to slaughter					X		
Conditions of slaughterhouse	X						
Method of slaughter		X	X				
<i>Regulations and inspections</i>							4
Inspections by external bodies		X					
Standards of inspection				X			
Welfare regulations					X		
Regulations						X	
Total							27

knowledge about broiler chicken farming. All results from the introductory survey are appended.

Variables thought to impact on chicken welfare

During the first exercise, all six groups produced a comprehensive list of variables that they believed could affect chicken welfare. There was no limit on the number of variables derived. These are detailed in Tables 2 and 3, and are differentiated between those variables that relate directly to physical conditions within the chicken shed and those that affect welfare from beyond the chicken shed. As can be seen, a wide range of variables were suggested. Although many more variables relating to conditions within the chicken shed were mentioned than variables relating to issues beyond the shed (45 versus 27), participants clearly recognised that wider issues such as the role of supermarkets, transportation, public opinion, slaughter, regulations and inspections, were important to the welfare of chickens.

Cognitive maps — workshop one

Having drawn up a list of variables, participants were encouraged to think about the relationships between different variables. Participants were expected to map the variables that they had already identified. However, as can be seen from the maps produced, this second stage resulted in production of additional variables.

Group 1A focused on issues such as natural light and heat, and also the cleanliness of the environment (see Figure 2). In addition to these variables, other basic requirements such as food, water, and space to move, were considered to be important. These could be said to constitute basic physiological needs. Of the six groups, this was the only one not to include in their map issues beyond the chicken shed, such as regulations, public opinion, inspections, and consumer behaviour. However, some of these were included in their initial list of variables.

One of the key variables identified by group 1B was the need for regular inspections by an external body. This was seen to impact on, and influence, a number of other variables including the overall welfare of the chickens but also the environmental conditions within the chicken shed, the amount of light, the slaughter process, marketing of cheap meat and the level of stress suffered by chickens during their lifetime. One of the participants made the following point:

“The inspectors should have the power to alter almost every aspect of the chickens’ environment”.

In line with the focus of the European Commission’s proposed directive on stocking density, group 1C considered that the variable ‘comfortable density of chickens in shed’ was linked to numerous other variables. Hence it was thought to positively influence overall chicken welfare, levels of stress, transportation (because of the number of birds involved), and access to food and water. It was negatively related to the profitability of chickens. Another variable that this group thought would impact on other variables was the issue of labelling to provide information about how the chickens were reared and slaughtered. They thought that such labelling information would have a positive impact on overall chicken welfare, quality of food and levels of stress at slaughter. In their discussion the participants of group 1C focused on the role of supermarkets in chicken welfare. They viewed the supermarkets as having a negative effect on broiler chicken welfare, leading to overcrowded sheds, stress, and pressure on farmers’ profits.

Open discussion followed the mapping exercise. In the discussion, group 1A focused on the immediate environmental factors that affected broiler welfare, as they had in their map. They identified the need for equal periods of light and darkness, the quality of food and drink, and having space to move around as essential to broiler chicken welfare. Other participants raised fears that many of the chickens would be diseased due to living in such a small area. They were surprised to learn that the mortality rate in broiler chicken sheds is around 5%:

“I’d have expected it to be around 30 or 40%, what with all the chickens being so close together in such a warm atmosphere”.

Several group members were concerned with what they termed the ‘artificial’ nature of the chickens’ lives but realistic about the necessity of such conditions:

“It is a shame the chickens don’t enjoy a natural life cycle, but I suppose this is necessary if we want cheap meat”.

Members of group 1C focused on the role of supermarkets in affecting broiler chicken welfare. This was linked to the relative importance of public opinion and economic concerns. The participants said economic concerns would always override public opinion:

“Supermarkets will demand production levels over the quality of the product”.

“Farmers will always have to produce chickens on a large scale to have any hope of making a profit from the supermarket”.

Participants in group 1B felt that, over time, people might start to demand chicken that is more tasty than the chicken that comes from intensive farms and that this might result in a change of buying policy from supermarkets. Another participant responded to this with the following comment:

“Chicken is the cheapest form of protein and this is down to intensive farming methods. Even with intensive rearing, chicken is healthier than red meat”.

Generally, the group recognised the economic benefits of intensive rearing but remained concerned that this compromised the welfare of broiler chickens.

Cognitive maps — workshop two

Group 2A identified a number of variables that impacted directly on chicken welfare (see Figure 3). These included public opinion, good living conditions and quality of food (all positively related to chicken welfare), and disease and diversity of chicken products (negative for chicken welfare). The fact that this group included variables such as public opinion, consumer demand, price, and chicken products indicates that they thought there was a connection between consumer behaviour and the conditions faced by the chickens.

Group 2B identified welfare regulations as being one of the key variables impacting on a range of other variables. Hence, regulations were seen to be able to positively influence overall chicken welfare, the cleanliness of the environment, the journey to the slaughterhouse and the method of slaughter, and also to reduce problems of disease and cramped conditions. They also made some links between what was good (or bad) for the chicken and what was good (or bad) for the consumer. Hence, disease in chickens was also considered to be bad for the consumer, and overall chicken welfare was considered to be good for the consumer. Clearly this group was thinking about the issues ‘beyond the chicken shed’.

Group 2C identified a number of issues that they believed impacted positively on chicken welfare — natural lighting, fresh air, a stable diet (a phrase used by participants which is taken to mean regular provision of an adequate diet) and freedom from stress and discomfort — as well as a number that they believed impacted negatively — overcrowding and transportation. In particular this group felt that overcrowding impacted negatively on a number of other variables, namely, cleanliness, the housing area and levels of stress and discomfort. They also felt that public opinion could have a positive impact on numerous variables, including overall welfare regulations, transportation and access to fresh air (the latter two presumably expected to improve due to regulations). Hence this group identified a chain of influence from public opinion, through regulation, and environmental factors to chicken welfare. Again, there followed a general discussion, during which members of group 2A referred to the influence of improved public knowledge:

“Better public awareness of intensive farming conditions might result in a fall in chicken sales and therefore improve broiler welfare”.

Figure 2

Group 1A Cognitive map.

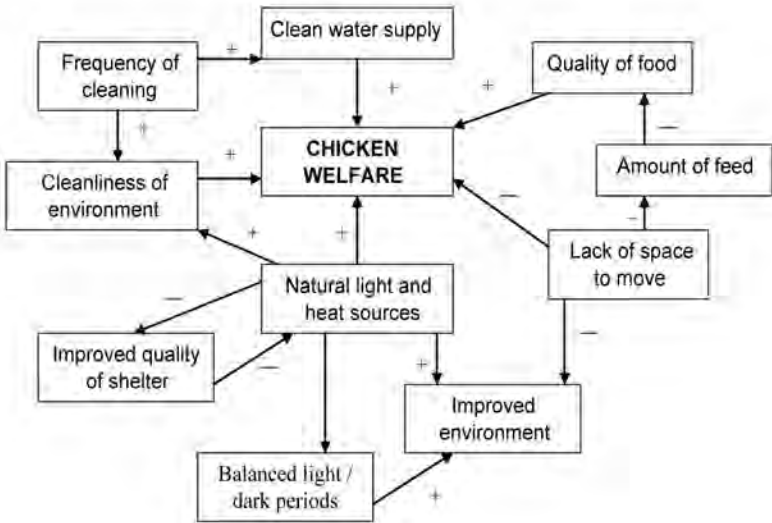
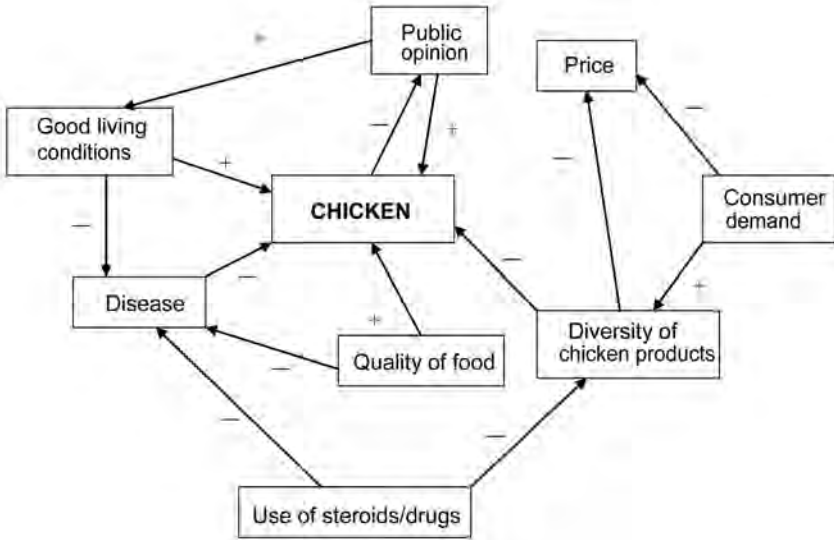


Figure 3

Group 2A Cognitive map.



Participants from group 2B raised concerns about the quality of meat derived from intensive chicken production: “How can you be sure of the quality of the meat when the cleanliness of chicken litter is so appalling? I’ve seen a TV documentary about chickens getting ammonia burns from sitting in wet litter — how does this affect the end product?”

Confronted with the question of public opinion versus economic concerns, members of group 2C were in no doubt that the supermarkets’ pricing policies were key to broiler welfare: “Many people will always go for the cheapest meat, whether out of stinginess or because they can’t afford anything better, so the intensive farming situation remains the same”.

One member of group 2C had some faith in public opinion though: “I think that greater public awareness of the situation would make people pay more for less intensively farmed meat, and so improve living conditions”.

Another respondent highlighted the fact that people were largely unaware of organically produced meat ten years ago, but that now it is a popular topic. This was thought to show how variables like public awareness might change over time and influence the welfare of broiler chickens. When it came to organic chicken, one participant commented: “I think the taste of ‘organic’ chicken is worth the expense. Unfortunately, people are used to watery, synthetic chicken though”.

As a whole, participants in this workshop were more confident of the potential of public opinion to alter broiler welfare than with the influence of supermarkets and farmers.

Ranking importance of variables — workshop one

This section reports the structured ranking of the 24 variables potentially affecting broiler chicken welfare.

Group 1A gave priority to 'access to food' and 'drinking water' (see Figure 4). Wider issues such as 'public awareness', 'regulations' and 'food labelling' were deemed less important to broiler chicken welfare. The role of the supermarket was judged to be among the least important issue for chicken welfare. Given the cognitive map produced by this group, these rankings serve to reinforce their position that it is the basic physiological needs that are most important.

Group 1B had identical priorities to group 1A, namely 'access to food' and 'drinking water'. Other basic environmental conditions such as 'ventilation', 'light' and 'temperature' were considered to be the next most important issues. Again, issues such as 'regulations', 'public awareness', and the supermarkets received fairly low importance rankings. Although to a certain extent this reflects the map produced by this group, the issue of 'number of times birds are checked daily' was given a ranking of only middle importance.

After the cognitive mapping exercise group 1C discussed the role of supermarkets, and their priorities here confirm their concerns, with supermarkets being considered the most important issue, alongside 'handling by farmer'. They also ranked 'public awareness', 'regulations' and 'labelling' on the 'most important' side of the scale.

After completing the ranking exercise there was a whole group general discussion. Once again, group 1C talked about the power of the supermarkets over the farmer, and in turn, the chickens. Groups 1A and 1B viewed immediate environmental factors as most important to broiler chicken welfare. Group 1A felt the character of the farmer was important, while group 1B recognised the importance of inspections in ensuring welfare. All participants felt that the welfare of the chickens was secondary to ensuring cheap prices at the supermarket. One participant stated:

"It is about getting a balance between caring for the chickens and not becoming too sentimental. You've got to accept the reality of intensive farming".

When the groups were asked whether public opinion would affect the welfare of broiler chickens, they were doubtful:

"It is too convenient to buy cheap meat for people to be really concerned about how it is produced".

"You know in the back of your mind what's going on, but you can't think about these things all the time".

Ranking importance of variables — workshop two

Group 2A reinforced the theme of the discussion after the cognitive mapping exercise by ranking 'public awareness of animal welfare issues' as one of the most important (see Figure 5). Their other most important issue was 'regula-

tions'. Environmental factors like food, water, light, and ventilation were also on the 'most important' side of the scale. They considered the 'character of the farmer' and 'handling by the farmer' as unimportant, perhaps in recognition of the fact that broiler production systems are largely automated.

As with group 2A, the ranking completed by group 2B shows that the 'role of the farmer' is perceived to be relatively unimportant to broiler chicken welfare. This group focused on 'public awareness' and 'food quality' as being most important to chicken welfare. Other environmental conditions such as drinking water, temperature and ventilation were also identified as being important. Regulations were considered to be of middle ranking importance, while the role of the supermarket was deemed unimportant, reflecting the discussion after the first exercise.

Group 2C deemed 'public awareness' and 'regulations' to be the most important issues for broiler chicken welfare. Food, water, light, and temperature were again placed on the 'important' side. Again, the farmer was seen to have relatively little influence on the welfare of their chickens, as was food labelling.

In the discussion that followed the exercise, all participants felt that public awareness could influence the other factors. One participant was cautious though and stated:

"Even if public opinion forced improvements in the welfare of chickens, you would be left with problems of supply and demand".

Group 2A explained why they considered ventilation to be important:

"Ventilation is important because it controls other things like the temperature and the state of the floor litter".

When asked to comment about the role of supermarkets, the groups explained why they were ambivalent towards this:

"The public should be able to influence the buying policies of supermarkets, but this goes back to improving public awareness".

Another person responded thus:

"Supermarkets are demanding smaller and smaller profit margins from farmers, and this means less money is spent on the welfare of chickens".

The group came to a consensus that there is a market for all kinds of broiler chicken farming, as different people will be prepared to pay different prices for different production methods.

Analysis of variable ranking

Analysis of the sorts produced by the ranking exercise reveals two factors that explain 69% of the variance between the six original sorts. These are briefly described below and make it possible to draw some overall conclusions about those welfare issues considered by the participants to be most important. For interpretation of these results the points on the ranking scale are given numerical values, with the scale running from 3 (most important) to -3 (least important).

Figure 4

			Pecking (bullying)			
			Treatment for injury			
		Character of farmer	Treatment for disease	Price of chicken		
	Type of food	Access to light	Floor litter	Public awareness of animal welfare issues	Country of origin	
Access to food	Food quality	Temper-ature inside shed	Stocking density	Food labelling	Speed of growth of chicken	Role of supermarket
Drinking water	Ventilation	Handling by farmer	Number of times daily that they are checked	Regulations covering broiler chickens	Transportation to slaughter	Noise levels
Most important issue for chicken welfare	←				→	Least important issue for chicken welfare

Group 1A: Ranking variables.

Figure 5

			Role of supermarkets			
			Price of chicken			
		Stocking density	Country of origin	Transportation to slaughter		
	Number of times daily that they are checked	Drinking water	Temper-ature inside shed	Pecking (bullying)	Handling of farmer	
Public awareness of animal welfare issues	Ventilation	Access to light	Treatment for injury	Speed of growth of chicken	Food labelling	Character of farmer
Regulations covering broiler chickens	Type of food	Access to food	Treatment for disease	Floor litter	Food quality	Noise levels
Most important issue for chicken welfare	←				→	Least important issue for chicken welfare

Group 2A: Ranking variables.

Consensus issues

There are a number of basic welfare issues that both factors agree are important to the overall welfare of broiler chickens. These include access to food, drinking water and ventilation (see Table 4). Correspondingly there are also a number of issues considered by both factors to be unimportant, including noise levels and rate of growth of chicken. There are just three issues that both factors considered to be neutral for chicken welfare, and they include treatment for disease and injury. Clearly, all participants place a high degree of importance on the immediate physical conditions experienced by the birds.

Factor one (groups 1C, 2A, 2B, 2C) — ‘the bigger picture’

Although there are a number of important points of consensus between the two factors, there are also distinguishing issues. What distinguishes factor one from factor two is the recognition that there are bigger social and political issues that can have important influences on the basic environmental welfare issues of broiler chickens. Hence the two issues considered by this factor group to be most important of all are public awareness of animal welfare issues, and regulations governing broiler chickens. The issues considered by this factor

Table 4 Consensus issues.

Variable	Factor one ranking	Factor two ranking
<i>Consensus issues: both factors find important</i>		
Access to food	2	3
Drinking water	2	3
Type of food	2	2
Ventilation	1	2
Stocking density	1	1
Access to light	1	1
<i>Consensus issues: both factors find unimportant</i>		
Noise levels	-2	-3
Speed of growth of chicken	-2	-2
Food labelling	-3	-1
Country of origin	-1	-2
Price of chicken	-1	-2
<i>Consensus issues: both factors find neutral</i>		
Treatment for disease	0	0
Treatment for injury	0	0
Floor litter	0	0

Table 5 Distinguishing issues.

Issues	Factor one score	Factor two score
Public awareness of animal welfare issues	3	-1
Regulations governing broiler chickens	3	-1
Role of supermarkets	0	-3
Character of farmer	-3	0
Food labelling	-3	-1
Handling by farmer	-1	1
Food quality	-1	2

group to be least important for chicken welfare are the character of the farmer, and food labelling and they also considered that handling by the farmer and food quality were unimportant (see Table 5).

Factor two (groups 1A, 1B) — ‘basic animal needs’

This factor is characterised by a very literal idea of what is important to the welfare of broiler chickens. Hence, members of this group have a clear notion of basic animal needs that include access to food, water, ventilation and light (Table 4). As with factor one this factor recognises that stocking density is important to overall broiler welfare but does not consider it to be as important as other environmental factors such as those already mentioned, or the temperature inside the shed, the quality of the food they are fed, or indeed the handling by the farmer. Nevertheless, the latter issue is considered to be somewhat important (score of 1), a view that distinguishes this group from factor one. Significantly, and unlike factor one, this factor considers the issues of public awareness, regulations and the role of supermarkets as being unimportant to broiler welfare. These results suggest that the participants associated with this factor concentrated on the immediate physical environment of the birds to a greater degree than factor one.

Discussion and conclusions

The results from the two workshops largely support findings from earlier research into consumer attitudes towards animal welfare (see for example, Köhler 1999). Significantly, there was very little prior knowledge about production methods and shock at discovering the reality of conditions under which broiler chickens are reared. There was also a stated intention from some participants to think more carefully when choosing meat products in the future. There was however a realistic awareness that if we want cheap food then the majority of chickens are never going to be afforded an idealistic, natural lifecycle. Participants were capable of understanding that there may be connections between their own purchasing behaviour and the conditions faced by chickens. However, they were also realistic about intensive agriculture and the role it inevitably plays in modern day food production.

Given the importance of public involvement in policy decisions, the approaches used here proved useful in directing, structuring and presenting public opinions relating to a complex and sensitive issue, in a relatively short space of time. The two approaches used in the workshops, although quite different in their method, largely

tell a similar story. This is that some participants emphasise the basic physiological needs as being important for animal welfare. However, other participants are more likely to think beyond the chicken shed and see a series of connected issues, starting with public opinion, consumer behaviour, the supermarkets, regulations and inspections through to the environmental conditions for chickens.

Nevertheless, the factor analysis reveals overall consensus that it is the basic physical needs that are most important: Access to food, drinking water, type of food, ventilation, stocking density and access to light. It is interesting to note that there is consensus that food labelling is unimportant for the welfare of chickens. This is likely because the labelling information about animal welfare currently available to consumers is negligible. The FAWC report (FAWC 2006) on welfare labelling stresses the need to increase such information.

The proposed EU directive on stocking density in broiler chicken production systems is the latest attempt to improve animal welfare. One purpose of legislation aimed at improving animal welfare is presumably to increase the benefit that consumers derive from the food they purchase. However, this work has demonstrated that while some people are concerned about the welfare of livestock, they have little knowledge about how their meat is produced. While this situation persists, people are not able to make choices about the meat they purchase according to their preferences. Hence, the benefit that EU residents would derive from the proposed directive is unlikely to be realised without additional food labelling and other forms of information being made available. This work serves to illustrate that among some members of the public at least, there is an interest in learning more about meat production and an ability to consider how a wide range of variables relate to animal welfare, including their own behaviour. The next step perhaps should be to provide potential consumers with the information they need to enable them to make informed choices.

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Appendices

Results from questionnaire distributed at workshops

Appendix 1 Would you say that you know anything about how chickens that are reared for meat production are farmed?

Extent of knowledge	Workshop one	Workshop two	Total
Yes, a little	5	5	10
Not sure	2	2	4
No, nothing at all	1	1	2
Yes, a lot	–	–	0
Never thought about it	–	–	0

Appendix 2 What (unprompted) factors influence your choice when you're in the supermarket or other shop buying chicken?

Factor	Number of mentions (workshop one)	Number of mentions (workshop two)	Total
Quality/freshness	5	3	8
Price	4	2	6
Appearance	4	1	5
How farmed/organically farmed	–	4	4
Breast meat only	2	1	3
Buying for recipe	–	2	2
Storage in store	1	–	1
Size	–	1	1
Packaging	1	–	1
Red Tractor mark of farm assurance	1	–	1
Leanness	1	–	1

Appendix 3 Which of the following factors influence your choice when buying chicken meat?

Factor	Number of mentions (workshop one)	Number of mentions (workshop two)	Total
Sell-by date	6	6	12
Appearance	5	5	10
'Quality food' labelling	5	3	8
Price	4	4	8
Animal welfare information eg RSPCA Freedom Food label	3	4	7
Country of origin	2	5	7
Special offers	1	4	5
Packaging	3	1	4
Your family	–	3	3

Appendix 4 Imagine you are given £10 a month that must be spent on food products that are farmed using better than average animal welfare standards. How would you spend it? (More than one choice permitted).

Food product	Number of mentions (workshop one)	Number of mentions (workshop two)	Total
Chicken	7	6	13
Fish	3	4	7
Eggs	1	5	6
Pork	1	3	4
Beef	1	2	3
Lamb/mutton	–	1	1
Duck	–	1	1
Game	–	1	1
No preference	1	–	1

Appendix 5
 Could you list any issues that you are specifically concerned about, relating to how farmed chickens are treated

Issue	Number of mentions (workshop one)	Number of mentions (workshop two)	Total
Battery rearing	3	2	5
Crowded environment	1	4	5
Hen house conditions	1	3	4
'Free range' conditions	2	1	3
None stated	2	1	3
Size of cages	1	–	1