CONSUMER WILLINGNESS-TO-PAY FOR FARM ANIMAL WELFARE IN GERMANY - THE CASE OF BROILER

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Abstract

Estimating the value consumers place on farm animal welfare (FAW) can predict the extent to which consumers are ready to support policy changes aimed at improving the welfare of farm animals and developing animal-friendly production systems that can also compete on markets. This study aimed at exploring consumer preferences and willingness-to-pay (WTP) for broiler meat in Germany which is certified as having been produced under a system that caters for FAW. In addition, logistic and linear regression models were estimated to examine the factors affecting consumers' decision to buy certified FAW products. The data was obtained from a survey of 300 German broiler consumers, which was designed using the contingent valuation methodology. The results showed that 82% of the respondents were ready to buy certified FAW products. A majority of these (95%) were willing to pay an extra sum of about €1.5 for 1 kg of the certified FAW broiler fillets. This represents a price increase of about 27% in comparison with the actual price of conventional broiler fillets. The WTP estimates reveal that there is a potential for improvement of FAW standards in conventional broiler production. The magnitude of these estimates, however, shows that consumer WTP is below the actual price premium demanded by producers for existing animal-friendly programs for broiler production. This explains why the market for certified FAW broilers fails and calls for a policy change towards higher minimum standards of broiler welfare.

Keywords: farm animal welfare (FAW), broiler, contingent valuation method (CVM), willingness-to-pay (WTP).

Zusammenfassung

Ziel dieser Studie ist es, Erkenntnisse über die Präferenzen der deutschen Verbraucher für das Wohlergehen von Nutztieren (farm animal welfare FAW) zu gewinnen. Erforscht wurde die Zahlungsbereitschaft für Hähnchenfleisch, welches FAW zertifiziert produziert wird. Außerdem wurden logistische und lineare Regressionsmodelle geschätzt, um die Faktoren zu bestimmen, welche die Verbraucher bei ihrer Kaufentscheidung für FAW zertifizierte Produkte beeinflussen. Die Daten wurden durch eine Umfrage bei 300 deutschen Hähnchenfleischverbrauchern ermittelt, wobei die kontingente Bewertungsmethode verwendet wurde. Die Ergebnisse zeigen, daß 82 % der Befragten bereit waren, FAW zertifizierte Produkte zu kaufen. Von diesen war die überwiegende Mehrheit (95 %) bereit, einen zusätzlichen Betrag von ca. 1,50 € pro kg für FAW zertifizierte Hähnchenfilets zu zahlen. Dies stellt einen Preisanstieg von ca. 27 % dar im Vergleich zu dem aktuellen Preis für konventionell produzierte Hähnchenfilets. Die zusätzliche Zahlungsbereitschaft der Verbraucher liegt jedoch unterhalb der aktuellen Preisprämie, die die Hersteller bestehender FAW-Programme in der Hähnchenproduktion verlangen. Dies erklärt, warum der Markt für zertifiziertes FAW-Geflügelfleisch nicht erfolgreich ist.

1. Introduction

The welfare of farm animals has become an important issue across developed countries (Bennett et al. 2002). This is shown by the increasing amount of legislations related to farm animal welfare (FAW) issues (Bennett and Blaney 2003, Harper and Henson 2001). Such legislations were first issued in the United Kingdom (UK) and have since been followed by legislations at the European Union (EU) level. The EU, for example, has issued a ban on conventional battery cages for laying hens starting from 2012. Similarly, a ban on sow stalls will come into force by 2013 (EU 1999, EU 2001).

In order to ensure FAW, minimum standards have been established by the EU. These minimum standards are supported by many mandatory and voluntary labeling schemes aimed at providing consumers with information on the welfare standards implemented in the production process. Labeling presents an effective tool to promote production systems that are in compliance with FAW standards (Passantino et al. 2008). Labeling schemes also provide an avenue for fulfilling certain requirements for quality assurance schemes like those aimed at ensuring issues such as food safety, product origin, and environmental protection.

Worldwide, many quality assurance schemes related to FAW are already established. For example: “Freedom Food” in the UK, “Label Rouge” in France, and “American Humane Certified”; “Certified Humane Raised and Handled”; and “Animal Welfare Approved” in the United States. Such labeling programs are largely voluntary third-party audit processes. The certification ensures that producers comply with special welfare standards that are higher than the minimum standards set up by the states. This provides consumers with an opportunity of buying products obtained with high FAW standards. The market share for such certified FAW products is relatively small in most of the EU countries (EU 2009).

In spite of the existence of several programs for alternative animal production systems in Germany (Verbraucherzentralen 2005), only few programs for broilers emphasize FAW. In addition, the market share of broilers from the existing special FAW programs is too small and most broilers available for German consumers are produced under the conventional production system.

The welfare problems of broilers in the conventional production system are caused by many reasons such as selective breeding for rapid growth, high stocking density, intensive feeding programs, and long transit periods (Manning et al. 2007, SCAHAW 2000). These circumstances increase the probability of lameness, ascites, poor litter and air quality, high sudden death syndrome, and stress among others. Due to such conditions, European states identified broiler production to be among the three animal production systems most in need of improvements in terms of animal welfare and protection (EU 2005). Given this emphasis at the European level, this study focuses on the issue of broiler welfare in Germany. It analyzes consumer attitudes towards FAW by looking at the value they place on buying certified FAW broiler meat.

The value consumers placed on FAW has been largely estimated by applying the contingent valuation method (CVM), which is widely used for the valuation of environmental amenities and natural resources (Bateman and Willis 1999, Mitchell and Carson 1989). The earliest applications of the CVM for valuing FAW were conducted to estimate WTP for policies supporting FAW (Bennett and Blaney 2002, Bennett and Larson 1996, Burgess et al. 2003, Moran and McVittie 2008, Rolfe 1999). The recent study provides an extension of existing literature by applying the CVM to estimate the expected extra WTP for a certified FAW broiler meat. The FAW certification ensures that the products have been produced under conditions that are compliant with the welfare needs of the animals. By evaluating WTP for FAW, the study aimed at investigating if there is any economic potential to improve broiler welfare in the conventional production system. In addition, regression analysis was estimated to examine the socio-economic factors affecting consumer decision to buy certified FAW products.

2. Valuing farm animal welfare using the contingent valuation method - a review

The CVM has been used in several studies to evaluate FAW. Some studies have focused on public WTP for specific practices related to FAW. Some others have measured consumers' WTP for food products that are produced in compliance with high FAW standards.

The earliest applications focused on public WTP for specific practices related to FAW. Four examples of such studies are provided by Bennett and colleagues. The first study evaluated people's WTP for changes in the breeding conditions of two production systems, namely veal production using confined crates and egg production using battery cages (Bennett and Larson 1996). The estimated mean WTP in tax form for both veal and egg productions was around $7.90. The second study assessed consumer WTP for better slaughter conditions. This implies a legislation compelling slaughterhouses to use the "Head to Back" system (Bennett and Blaney 2002). The reported mean WTP in tax form for the "Head to Back" slaughtering system was £1.37 p/week. The third study investigated WTP for a legislation to ban the export and import of live animals for slaughter and the use of egg cages (Bennett et al. 2002). The WTP estimates in this example were £1.60 p/week for export legislation and £0.94 p/week for egg legislation. The final study measured the willingness to support legislation to phase out the use of battery cages for egg production in the EU (Bennett and Blaney 2003). The study reported a mean WTP of £0.41 per dozen eggs for the EU egg legislation.

In yet another example, Burgess et al (2003) estimated public WTP for four specific improvements: removing the cages for the laying hens, using slower growing breeds for chicken, providing shared lying areas on a deep bed of straw for dairy cows, and increasing the size of pens and adding straw and rooting materials for pigs. The extra weekly WTP results showed that better laying conditions for hens was the most supported policy (£2.95) followed by better conditions for dairy cows (£2.89). Support

for improvement in conditions for chicken (£2.63), and pigs (£2.10) followed in that order.

The general aim of these studies was to establish the moral concerns that people might have regarding specific welfare changes, which was supposed to be reflected in the WTP measures. Similar applications of the CVM can also be found in other studies (e.g., Glass et al. 2005, Moran and McVittie 2008, Rolfe 1999).

In comparison to these studies, recent applications have concentrated on consumer WTP for food products produced with regard to high FAW settings. A German study analyzed consumer WTP for pork produced by a husbandry on straw with reduced stocking density (Schulze et al. 2007). About one third of the respondents were ready to pay up to €1 for 1 kg pork chop from the straw husbandry and 15% were ready to pay between €1.5 and €2. Another study compared consumer WTP for certified animal-friendly products including meat, eggs, and dairy products in five EU countries (Nocella et al. 2007). The stated WTP estimates were not for a specific change in animal treatment but for ensuring utmost respect for animals. WTP estimates showed that, on average, respondents were willing to pay an extra €11.11 p/week for animal-friendly products.

The present study contributes to the literature of consumer WTP for FAW by focusing on the important issue of broiler welfare, since little empirical evidence has been obtained in this area both in Germany and at the EU level.

3. Methods and data collection

3.1 The contingent valuation method

Contingent valuation is a stated preference method used for the valuation of non-market goods and services (Carson et al. 2001). It is a survey-based method in which respondents are asked to express their preferences towards a presented hypothetical market. The method combines neoclassical economic theory and socio-empirical methods to estimate the economic value of goods, services or public programs. Cost-benefit analysis (CBA) provides the theoretical background within which the CVM works.

By eliciting individuals' preferences, the CVM can find out whether they would be willing to pay (benefits) or to accept compensation (cost) for specific changes in the quality or quantity of a given good. The analysis provides a mean to estimate the consumer surplus (compensating and equivalent variation) and answers questions regarding respondents' future intentions. Since the elicited values in this approach are contingent upon the particular hypothetical market described to the respondents, the method is commonly called contingent valuation (Carson et al. 2003).

3.2 Survey design

A four-section questionnaire following Mitchell and Carson (1989) was designed. The first section included some general introductory questions about consumption habits and knowledge of animal breeding systems. The second section solicited information about the conditions in which broilers are kept. A distinction was made between conditions of the conventional production system and other alternative systems with possible welfare improvements on living conditions, transport, and slaughter. These improvements were described to consumers as reducing stocking densities, decreasing growth rates, short transit periods, and rapid and effective stunning.

The third section presented attitudinal questions, in which consumers were asked to score on a likert scale of 1-5 (*1 = disagree, 5 = completely agree*) their opinions on: trusting the labeling information about FAW that could be found on the product; the need for the intensive production system, so that the price remains as low as possible; the meat quality from animal-friendly systems; and the degree of personal interest in buying meat from animal-friendly systems. Consumers were then asked if they would pay more for certified FAW products "FAW-certified" that ensure improved living conditions as well as proper transport and slaughter conditions (Appendix 1). If the answer was affirmative, respondents were asked to state the price premium they would be willing to pay for 1 kg broiler breast fillets produced under the described conditions. A payment scale with seven consequential bids ranging from €0.75 to €5.25 was offered to elicit this price premium. An actual reference market price of about €5.50 for 1 kg conventional broiler fillets was presented to help consumers to make their choices. The payment scale technique was used because it enables respondents to select from a wide range of choices, which provides detailed information about consumers' response on the WTP question. The use of many bid amounts was to cover the various prices for broiler breast fillets in German markets. The maximum bid amount of extra €5.25 represents an increase of 100% in the price of conventional meat. This is supposed to reflect the average extra cost of broilers from animal-friendly production systems such as the free-range broilers, which is twice as expensive to produce as conventional broilers (Theuvsen et al. 2005).

Following up on the WTP question, respondents who objected paying were asked to explain the reason behind their decision. Three possibilities for answering this question were presented. The first choice was *"in spite of my interest in FAW, I cannot afford high meat prices"*. The second was *"I am satisfied with the conventional system. How animal are farmed, is not a matter of interest to me"*. An open-ended choice was offered to be the third possibility for respondents to address their opinions.

The last section contained questions about respondents' socio-economic details such as sex, age, education, and income.

3.3 Pilot study and data collection

A pilot survey was conducted on 73 broiler meat consumers in Göttingen (Northern Germany). The questionnaire was clearly understood with the exception of the questions

regarding animal breeding systems, which were not clear for a group of the respondents. For instance, respondents were unable to differentiate between animal-friendly and organic systems. To avoid such misunderstanding in the main study, differentiation was made later only between conventional and animal-friendly systems. Little knowledge about broiler production methods was also recognized in other studies in the EU (Hall and Sandilands 2007).

The main study consisted of a survey of 300 broiler consumers and was carried out in Göttingen between July and September 2007. This exploratory survey was conducted using face-to-face interviews in supermarkets, public places (parks and city center), and mainly at the university.

4. Results and discussion

The analyses were applied on the 300 completed questionnaires of the main survey. It was undertaken using the Statistical Package for Social Sciences (SPSS version 16).

4.1 Descriptive statistics

The collected socio-economic data (Table 1) showed that about half of the respondents (49.7%) were women. The mean household size was 2.27 persons. Half of the respondents grew up in rural areas. Regarding respondents' education, 3.7% of the respondents had general school level, 21% had general certificate of secondary education, 44.3% had high-school diploma, while 31% had university degree.

With regard to the attitudinal questions, respondents chose mostly the middle of the scale when asked about trust on labels regarding FAW, with 34% being somewhat trusting and 8.3% showing a high degree of trusting. Only 2.7% did not trust the labels at all. About 28% did not agree with the statement "*intensive farming is important, so that the price remains as low as possible*". In contrast, only 6.7% agreed with this statement completely. There was a strong feeling that FAW improves the meat quality. Sixty-five percent almost fully or completely agreed with this statement. Quite similar preference patterns were shown with respect to the degree of interest in buying meat from animal-friendly systems. About 59% almost fully or completely agreed that they are interested in buying meat from animal-friendly systems.

Table 1. The analyzed socio-economic variables

		Minimum	Maximum	Mean	Percent of sample
Gender- female		0	1	-	49.7
Age*		1	7	3.36	
Household size**		1	5	2.27	
Origin- urban		0	1	-	50.0
Income***		1	7	3.29	
Education-	General school	0	1	-	3.7
	General certificate of secondary education	0	1	-	21.0
	High school	0	1	-	44.3
	University	0	1	-	31.0

*Seven age groups were given (17-20, 21-30, 31-40, 41-50, 51-60, 61-70, and over 70 years) and coded from 1 to 7, respectively.
**A number from (1-5) persons in the household was offered for this variable.
***Seven monthly net income groups in Euros were given (up to 499, 500-999, 1000-1499, 1500-1999, 2000-2499, 2500-2999, and above 3000) and coded from 1 to 7, respectively.

4.2 Regression analysis

Regression analysis was carried out in order to show the effects of socio-economic characteristics on consumers' purchase decisions. Two regression models were estimated, namely: a binominal logit model to identify factors determining whether or not a consumer is willing to pay for FAW, and a linear regression model for the sub-sample of respondents reporting positive WTP. The independent variables used in the study included (a) dummy variables: gender (0 = male, 1 = female), origin (0 = grew up in rural areas, 1 = grew up in urban areas), and education level (1 = university, 0 = otherwise); and (b) continuous and interval variables: household size (1-5), age (seven age groups were given 17-20, 21-30, 31-40, 41-50, 51-60, 61-70, and over 70 years. The age groups were coded from 1 to 7, respectively), income (seven monthly net income groups were given €499, €500-999, €1000-1499, €1500-1999, €2000-2499, €2500-2999, and above €3000. The income groups were similarly coded from 1 to 7, respectively).

a. The binominal logit model

This model was used to determine the socio-economic factors affecting consumer willingness/unwillingness to pay for "FAW-certified" products. The respondents who rejected paying extra (17.7% from the whole sample) were coded 0 and all others who accepted to pay more were coded 1. Results derived from the binominal logit model are presented in Table 2. The coefficient estimates refer to the effect of the variables on the probability of accepting to pay more for "FAW-certified" products. Since the adjusted R square should not be used in the binary logistic regression, other alternatives such as Cox & Snell R square and Nagelkerke R square could be calculated. Their corresponding values revealed that more than 40% of the variation could be explained by the variables

included in the estimated model. Gender and origin were not significant and therefore did not affect the decision on whether or not to pay more for "FAW-certified" products. Elderly people, respondents with high incomes, and those with large families were found to be more likely to accept paying more for certified products. University education level was significant at 1% level indicating a positive significant effect of higher education on consumer decision to support FAW. However, the relatively high proportion of educated people in the sample might exaggerate the significance of this variable.

b. The linear regression model

For further analysis, a linear regression model was used to examine the relationships between socio-economic characteristics and positive WTP estimates. Table 2 presents results of the estimated linear regression model. In this model, all of the independent variables were significant except origin, which did not seem to affect consumer WTP for "FAW-certified" broiler meat. The estimated adjusted R square revealed a good fit of the model. The results of this model appeared to be similar to the above mentioned one with the exception of gender factor, which was not significant in the binominal logit model.

Table 2. Parameter estimates of the WTP regression models

	Binominal logit Model[1]		Linear Model[2]	
Variable[1]	β	S.E.	β	S.E.
Gender- female	0.021	0.062	0.323***	0.090
Age	0.229***	0.022	0.284***	0.007
Household size	0.097***	0.025	0.315***	0.011
Origin- urban	-0.004	0.064	-0.022	0.026
Education- University	0.204**	0.077	0.078**	0.030
Income	0.212***	0.026	0.088***	0.009
Adjusted R square			0.874	
Cox & Snell R square	0.419			
Nagelkerke R square	0.558			

[1] The dependent variable for this model is the willingness/unwillingness to pay for FAW. The respondents who rejected paying extra were coded 0 and all others who accepted to pay more were coded 1.
[2] The dependent variable for this model is the positive WTP estimates.
* Significant at 0.05 level, ** significant at 0.01 level, *** significant at 0.001 level.

4.3 Willingness-to-pay estimates

Nearly 82.3% of the respondents were willing to pay extra for certified FAW products, while the rest (17.7%) objected paying more.[1] Among those willing to pay more, the

[1] The reason behind rejecting paying more in the pilot study was mostly (85%) because consumers could not afford high prices. About 11% showed no interest in animal treatment. Four percent mentioned other reasons like having other important issues or believing that they are not responsible for animal welfare.

WTP was much stronger for three bids. The second bid (€1.5) was the most preferred one and was chosen by 30.2% of the respondents. The second most preferred bid was the third one (€2.25), which was chosen by 26.9% of the respondents. The fourth bid (€3) was chosen by 22% of the respondents and was the third most preferred bid. The two extreme edges of the payment scale were less preferred. The lowest bid (0.75) was chosen by 6.1% and the highest bid (€5.25) by only 1.6%. The frequency distribution of WTP amounts is shown in Figure 1.

The calculated mean WTP for 1 kg of "FAW-certified" broiler fillets was found to be €2.36 with a standard deviation of 0.95. These WTP estimates are in line with other studies addressing FAW issues. Schulze et al. (2007), for example, reported that the majority of German consumers were willing to pay a price premium of about 10-35% in support of a pig husbandry on straw with a reduced stocking density.

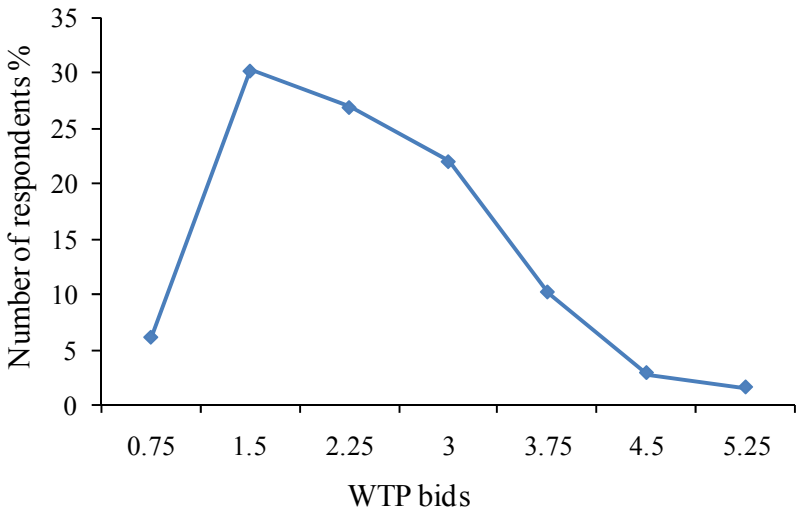

Figure 1. Frequency distribution of WTP for broiler welfare

The estimated WTP amounts in this study present evidence of support for FAW among consumers, particularly with respect to the welfare of broilers. The estimated mean WTP is lower than the price premium on broiler meat produced under some existing special FAW programs such as the free-range system. The price of broiler meat from free-range husbandry is at on average double the price of conventionally produced broiler meat. Yet, in the present analysis, the doubling of broiler meat prices in support of FAW is shown to be supported by a very small share of the consumers. Only 1.6% were ready to pay the last bid (€5.25), which represents a price increase of 100% relative to the price of conventionally produced broiler meat. However, the mean WTP reported in this study shows that there is a potential for improving FAW. It represents up to 43%

This question was not included in the main survey because consumers did not show high response to answer it.

premium on the price of conventional broiler, which can cover the costs of improving some indoor conditions of the conventional production system. Improvements in indoor conditions can be achieved by practices such as reducing stocking densities, slow growing rates, and adding some environmental enrichments.

5. Conclusion

In this study, we explored consumer attitudes towards and preferences for FAW. At the center of the analysis was the issue of consumers' WTP for "FAW-certified" broiler meat. Based on a consumer survey of 300 broiler consumers conducted in Germany in 2007, the study applied the CVM to estimate consumer marginal WTP for "FAW-certified" broiler meat.

Consumers showed little knowledge about animal-friendly production methods. In addition, there was a strong feeling among consumers that FAW improves meat quality. The results of the WTP analysis indicate that a "FAW-certified" broiler product is positively valued by German consumers. Around 82% of the respondents were ready to buy certified FAW products. A majority of these (95%) were willing to pay an extra sum of about €1.5 for 1 kg of the certified FAW broiler fillets. This represents a price increase of about 27% in comparison with the actual price of conventional broiler fillets. The mean WTP presents consumer surplus for improving the welfare of broilers. Nevertheless, the magnitude of this surplus showed that consumer WTP is lower than the price of the existing welfare-labeled broilers. The estimated two regression models showed almost similar results. In both the binominal and the linear regression models, elderly people, those with large families, and people with high incomes revealed to show significant WTP for "FAW-certified" broiler meat.

Based on the estimated WTP and the positive consumer impression of meat quality from animal-friendly products, it is worth to suggest that there is a potential for improving the welfare conditions of broilers in Germany. The significant gap between the measured WTP and the high consumer prices of broilers from the existed animal-friendly production systems provides evidence that the free market mechanisms will probably not contribute effectively towards improving broiler welfare since the high price premiums were only supported by a small segment of consumers. Therefore, raising minimum standards by implementing stricter FAW regulations seems to be a more effective way to improve the welfare of broilers.

The welfare improvement, however, could be achieved by many different practices such as reducing stocking densities, slow growing rates, and short transport periods. More accurate estimates of consumer WTP would thus require methods that evaluate consumer preferences for the individual practices, which in turn enable the identification of those practices presumed by consumers to be of critical welfare importance in the production process. Such analysis would require other stated preference methods such the choice experiment, an option we intend to apply in our further analyses.

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Appendix 1

- Suppose you can find in supermarkets and butcheries products with a label ensuring the welfare of the animals (good living conditions with proper transport and slaughter).

  If such products are more expensive than the uncertified products of the conventional system,

- *Would you pay more for such products?*

  …… Yes , ……No

- *If Yes …How much would you pay more for 1 kg broiler breast fillets certified as welfare quality product? (conventional meat price = 5.50)*

  up to (€): 0.75 1.5 2.25 3 3.75 4.5 5.25