

## **Does having a Choice make a Difference? Market Potential of the Animal Welfare Label in Germany**

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### **ABSTRACT**

This paper investigates the effects of the introduction of a specific animal welfare label on consumer decision making when shopping for pork. Based on two empirical studies, we analyze whether substitution effects between organic, regional, and animal welfare products have to be expected under current market conditions. Our results show that persons with preference for animal welfare decide significantly more often for the animal welfare or the organic product, not for local, and that organic heavy buyers do not differ from rest of sample with respect to animal welfare or local choice. The animal welfare label as stand-alone selling proposition may be too weak to create value added. Based on the examination of interaction terms, we find that organic does not gain by combination with an animal welfare label, whereas regional labels are not associated yet with animal welfare and would profit more by including an additional informational cue. We tentatively conclude that animal welfare programs should be embedded in regional marketing programs.

**Keywords:** *organic, regional, choice experiment, interaction terms, mixed logit*

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### **Introduction**

The public interest in higher animal welfare for pigs is still unbowed (Spiller et al., 2015). NGOs, politicians, scientists and experts of agribusiness and farmers likewise discuss political and marketing solutions to increase farm animal welfare. The central question of the debate is, if the public demand for an increase in Animal Welfare is mirrored in consumers' purchase behavior. In the year 2013 an Animal Welfare label was introduced by the German Association for Animal Protection (Deutscher Tierschutzbund). This label, however, still has a very low market share, leading to considerable doubts among practitioners whether the efforts to increase animal welfare in stables would pay-off at all.

We argue that whether consumers in reality are willing to pay more for an animal welfare product will depend on their preferences for animal welfare, but also on their possibilities to satisfy this need, e.g., through alternative products. This specifically refers to organic products, which by guideline also should fulfill animal-friendly husbandry conditions, but probably also regional, or local, products, which have recently competed for market shares with organic products. These attributes have been shown by other researchers to be of considerable importance (e.g. Roosen, Lusk & Fox, 2003). The question thus arises whether consumers with animal welfare preferences would assume that their needs could be satisfied as well by regional or organic products, which provide further added value, or whether they would, faced with these three types of products, would choose the animal welfare-labelled alternative. In this context, of course, the price can be deemed crucial.

Against this background, this paper investigates, based on two empirical studies, whether substitution effects between organic, regional, and animal welfare products have to be expected under current market conditions. The remainder of this paper is organized as follows. First, we review the literature on consumer preferences for animal welfare as well as trade-offs and substitution effects between organic and regional products. Then, we present results of two discrete choice experiments which enable us to identify substitution effects among the

above described concepts. These are discussed with respect to the research question and we draw first conclusions as to the positioning of animal welfare products in the pork market.

## Literature review

We can rely on a number of studies dealing with preferences for organic, regional and animal welfare products. Zander and Hamm (2010) identify animal welfare, regional provenience, and fair prices for farmers to be the most important additional arguments to buy organic products. Several studies found that consumers make strong associations between organic and animal welfare (Zenner, Wirthgen, & Altmann, 2005; Kuhnert, Feindt, Wragge & Beusmann, 2003; Harper & Makatouni, 2002). Associations between regional products and animal welfare, on the other hand, have been less investigated. We are only aware of one qualitative study from the US, which identified a strong cognitive association (Zepeda & Deal, 2009).

However, it is well established in the literature that regional food is generally very positively perceived and associated with higher ethical promises (e.g. Henseleit et al., 2007), which could also include animal welfare.

In the analysis of consumer preferences, many studies have dealt with single labels as attributes (Lusk & Briggeman, 2009). Recently, the focus has shifted to interaction effects. Onozaka & McFadden (2011) showed substitutional as well as complementary relations of regional and sustainability labels for the examples of tomatoes and apples, respectively, which can be based in overlapping or additional buying motives.

It has been shown for a number of product categories, that regional products attract a larger target group or triggers stronger buying intentions than organic (e.g. Loureiro & Hine (2002) for potatoes in the US, or Hasselbach and Roosen (2015) for beer, bread, and milk). Hasselbach and Roosen (2015) furthermore found positive interactions between organic and regional production in all three product categories. For meat there are several studies which underline the relevance of regional provenience, namely in beef (Roosen et al. 2003; Umberger et al. 2003).

With respect to pig animal welfare, there are studies which investigated willingness-to-pay for individual animal welfare measures (Lagerkvist et al. 2006; Liljenstolpe, 2008), but a simultaneous analysis of organic, regional and animal welfare attributes is missing. In the following we describe the two discrete choice experiments by which we aim to address this research gap and to answer the question *“Does animal welfare as a product characteristic generate additional demand, or are animal-welfare oriented consumers captured by other ethical cues?”*

## Material and methods

To investigate the issue of substitutional or complementary effects of product attributes such as organic, regional, or animal welfare labels, we take the example of pork meat, or Schnitzel, more specifically. We can draw upon two consumer surveys from the years 2011 (study 1) and 2015 (study 2) respectively. The study from 2011 was carried out online with the support of an online-panel provider and aimed at being representative for the German adult population, while the second study was carried out as personal, computer-assisted interviews with food shoppers at ten retail outlets of one retail chain in Northern Germany.

The share of women is at 50.8 % (2015: 59.3%), and the average age is 42.2 (43.8) years, with a minimum of 18 (17) and a maximum of 75 (83) years. Both studies include questions to measure meat shopping behavior, consumption of different meat types, attitudes towards meat consumption, animal welfare and organic products as well as socio demographic characteristics. Furthermore, each study comprises a discrete choice experiment to estimate consumers' willingness-to-pay for the above mentioned attributes (e.g. Louviere & Woodworth, 1983).

Participants are usually confronted with a number of choice situations (“choice sets”) to simulate a shopping situation, where each choice set comprises at least two alternative products and an “opt out” alternative, in case that a person would not be willing to buy any of the offered product alternatives. The products are systematically varied with respect to a number of characteristics (attributes). In our case, the alternatives were depicted as an offer of 500g of pork schnitzel.

The studies differ in a number of aspects. First, in the 2011 study, we modelled the animal welfare, organic, and regional labels as different levels of the same attribute, with “QS”-label as reference level, meaning that no interactions between labels could occur, since only one could be shown per product alternative. In 2015, we

allowed for combinations of the labels, to be able to measure interaction effects (simultaneous occurrence of labels).

Further, the attributes and attribute levels used in the two studies are not identical: in 2011, there was no animal welfare label available as a cue to inform consumers about a product's being produced subject to higher animal welfare conditions. We therefore used a simple text line claiming "from animal-friendly husbandry" as a cue. In 2013, to the contrary, the animal welfare label of the German Association for Animal Welfare had been introduced, so that we could use this label (entry level) in our study.

We used the software package STATA13 to estimate the effects of our attributes by means of mixed logit models (Train, 2009, Hole 2007). These models allow for capturing heterogeneity in preferences, which are expressed as standard deviations of the coefficients (Train, 2009). The explicit modelling of interaction terms can improve the explanatory power (Louviere, Flynn, & Carson, 2010).

While in study 2, direct interaction terms between the labels could be estimated, in case of study 1, we created interaction terms of the labels with target groups of organic and animal welfare labels, respectively. These target groups were defined by their stated buying behavior with respect to organic meat products and by their attitudes towards animal welfare, respectively.<sup>1</sup> The cross tabulation of the two variables shows that while among the organic heavy consumers, there is a share of 76% persons with an above average animal welfare preference, while on the other hand, among the group of participants with above average animal welfare preference, there are only 35% organic heavy consumers.

## Results of the discrete choice experiment

### Key results of study 1

Table 1 presents the results of study 1, with model 1 comprising the main effects of the product attributes, and model 2 additionally includes the interactions. We present only the mean coefficients as well as the respective confidence intervals.

**Table 1: Results of mixed logit model (study 1)**

Choice	Model 1		Model 2	
	Coef.	95% CI	Coef.	95% CI
Price	<b>-0.256***</b>	-0.276; -0.236	<b>-0.257***</b>	-0.277 ; -0.238
Organic	<b>0.996***</b>	0.858; 1.135	<b>0.405***</b>	0.155 ; 0.500
Animal Welfare	<b>0.720***</b>	0.595; 0.846	<b>.439***</b>	0.389 ; 0.711
From the region	<b>1.071***</b>	0.949; 1.194	<b>1.214***</b>	0.962 ; 1.275
Regional feed	<b>1.318***</b>	1.204; 1.431	<b>1.324***</b>	1.210 ; 1.438
High quality feed	<b>1.174***</b>	1.056; 1.293	<b>1.170***</b>	1.054 ; 1.292
Without imported soybeans	<b>0.741***</b>	0.622; 0.859	<b>0.744***</b>	0.623 ; 0.862
Organic*OrganicHeavy			<b>1.321***</b>	1.023 ; 1.620
Local*OrganicHeavy			-0.149	-0.423 ; 0.126

<sup>1</sup> Organic meat shoppers were segmented based on their answer to the question „When buying meat, how often do you decide to buy the organic alternative?“, which could be answered on a four-level scale anchored as “Always”, “Often”, “Seldom” and “Never”. We collapsed the first two categories into the category “heavy consumers” and used this as dummy variable to interact with the labels. Participants with animal welfare preference were identified based on their answers to three questions relating to animal welfare as a decision criterion, where we used Median split to determine the dummy variable for above-average animal-welfare preference.

AW*OrganicHeavy			0.028	-0.248 ; 0.304
Organic*AWPreference			<b>0.760***</b>	0.520 ; 1.000
Local*AWPreference			-0.040	-0.185 ; 0.265
AW*AWPreference			<b>0.570**</b> *	0.345 ; 0.795
Organic_female			-0.47	0.277 ; 0.182
Local_female			<b>-0.233*</b>	-0.446 ; -0.019
AW_female			0.011	-0.205 ; 0.226

Mean ; \* p-value < 10%, \*\* p-value < 5%, \*\*\* p-value < 1%

As expected, the price does negatively affect the propensity to buy; all other characteristics have a positive, though not always significant effect. As shows model 2, organic heavy consumers have an exclusive preference for organic products and do not differ from the rest of the sample with respect to preference for regional or animal welfare products, while the effect of organic label on buying probability is reduced to half of the main effect in model 1, meaning that the remainder of the sample does not strongly react to the cue of an organic label.

Persons with a high animal welfare preference, on the other hand, show a highly significant positive interaction with both the organic and the animal welfare label, but no significant interaction with the regional labelling. We also observe a slight increase in the main effect of the slogan “from the region” when controlling for organic and animal welfare preferences, while the other, feed-related main effects remain unchanged.

**Key results of study 2**

Table 2 presents the results of study 2, with model 2 again including the interaction terms, while model 1 just includes the main effects of the product characteristics.

**Table 2: Result extract of mixed logit model study 2**

Choice	Model 1		Model 2	
	Coef.	95% CI	Coef.	95% CI
Price	<b>-0.115***</b>	-0.141; -0.089	<b>-0.141***</b>	-0.169; -0.112
Organic	<b>0.767***</b>	0.563; 0.971	<b>1.166***</b>	0.888; 1.445
AnimalWelfare	<b>0.299***</b>	0.139; 0.459	<b>0.789***</b>	0.508; 1.069
Brand	<b>0.290***</b>	0.125; 0.455	<b>0.265***</b>	0.091; 0.440
"Fair price for farmers"	<b>0.843***</b>	0.679; 1.007	<b>0.839***</b>	0.665; 1.013
"From the Region for the Region" (RegioA)	<b>0.787***</b>	0.577; 0.997	<b>1.271***</b>	0.923; 1.618
"Fed with regional feed" (RegioF)	<b>0.666***</b>	0.470; 0.863	<b>0.744***</b>	0.456;1.031
"Transportation time <6hrs"	<b>0.186**</b>	-0.024; 0.395	0.166	-0.049; 0.381
Organic*AnimalWelfare			<b>-0.687***</b>	-0.994; -0.381
Organic*RegioA			<b>-0.665***</b>	-1.029; -0.301
AnimalWelfare*RegioA			<b>-0.518**</b>	-0.989; -0.048
AnimalWelfare*RegioF			<b>-0.390*</b>	-0.796; 0.015

Mean coefficients; \* p-value < 10%, \*\* p-value < 5%, \*\*\* p-value < 1%

“ ” indicates that a text was shown instead of a label

All standard deviations significant at  $p < 1\%$

As in study 1, all signs of the coefficients indicate the expected direction of attribute effects. Compared to organic and regional label, the animal welfare label has a considerably weaker impact on willingness to buy. The inclusion of interaction terms in model 2 leads to increases in all affected main effects, while the other coefficients remain almost unchanged. The coefficient for "transportation time <6hrs" is the only coefficient which was included in model 1 as a significant effect and becomes insignificant in model 2. All interaction terms are negative, indicating substitution effects.

The main effects for Regio A ("from the region for the region") and organic are highest in model 2, followed by "fair price for farmers", Animal Welfare Label, and Regio F ("fed with regional feed"). Overall, the effect of combining animal welfare and organic label is almost inexistent, while there is a positive net interaction effect of regional and animal welfare label. Organic and regional, however, yield the highest combined effects, despite the significant negative interaction term.

## Discussion

Investigating whether in the meat market there is room for a differentiation based on animal welfare, we put the question if persons with animal welfare preference actually represent an additional target group or if there is an overlap with target groups of organic and regional products. If the latter would be the case, we would have to expect a cannibalization of the differentiated segments instead of generating value added to the market. This would question the approach of enhancing animal welfare with a market solution.

Organic and regional labelling are superior to the products labelled as animal welfare in both studies, indicating a clear preference for the broader schemes as compared to the animal-welfare-only promises. From study 1, we learn that the heavy organic consumers do not have a specifically higher preference for buying regional or animal welfare products than the other participants, while the main effect of organic shrinks considerably, indicating that besides the heavy consumers, organic does not strongly trigger choice. Furthermore, participants with a higher preference for animal welfare in this study do not choose the regional alternative more frequently than the rest of the sample, indicating that there is no clear association of regional products with animal welfare. Overall, we conclude that persons with animal welfare preference can be expected to choose products labelled as "from animal friendly husbandry" if these are offered, or opt for an organic alternative, with price being the traditional barrier. Given the fact that those with preference for animal welfare do not see the regional argument as a cue to satisfy their need for animal welfare. The regional label could thus profit from the combination with an animal welfare label.

With the second study, we allow for interactions between the labels, to investigate whether there is a strong overlap between the concepts or not. We assume the following relationships: if the increases in main effects would be reduced to zero by negative interaction terms (substitution), this would indicate that the concepts are perceived as interchangeable, and no added value is created by the combination of two labels. Our results show clearly that the high animal welfare preference of organic buyers does not lead to the organic label profiting from an additional animal welfare label. Rather, the organic concept is perceived to provide improved animal welfare already. A combination with the regional labels, on the other hand, would lead to increased willingness to buy for both organic and animal welfare products, meaning that these concepts are not viewed as overlapping. The interaction terms in study 2 show that while the organic label cannot be upgraded by adding an animal welfare label, the regional label would be chosen more frequently, c.p., if combined with the animal welfare label. The positive main effect for animal welfare products shows that there is a certain willingness to buy also for products with this label only. However, the effect is small compared to organic and regional, indicating either that there is a small group with a high willingness to buy (and pay) and a larger rest which has a low to non-existent willingness to pay, or that the overall group is characterized by a low to moderate willingness to pay for animal welfare as a stand-alone argument. The confidence intervals as well as the significant standard deviations across all attributes show that there still is considerable heterogeneity in the sample which needs to be addressed, e.g., by means of latent class analysis.

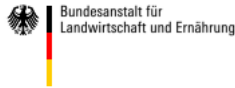
The results nevertheless already indicate that animal welfare labels should best be positioned as regional products at the same time. This creates room for regional producer associations to develop targeted programs. There have been such attempts more than 20 years ago in Germany, which to the majority failed, often due to marketing errors. We argue that with the changed societal awareness and the strong trend towards regional products which is triggered also by retail chains, such approaches could have a higher chance of success today.

## Conclusion to the positioning of animal welfare products

With this study, we add to the literature on consumer buying behavior in ethical segments. Specifically, we show the effects of considering consumer segments on the estimated willingness to buy. Two large-scale surveys provide insights into consumers' decision making when confronted with organic, regional, and animal welfare labels. Overall, we can conclude that the target group for pork from animal friendly husbandry to a considerable extent overlaps with the organic target group. The regional labelling, which generally reaches a broader range of consumers, however, could, in combination with an animal welfare label, attract additional buyers and thus generate added value. We can see from the change in main effects when controlling for interactions, that the overall willingness-to-buy would have been considerably underestimated if we had not controlled for our two target groups. The remaining positive main effect for the animal welfare product however also shows that our measure of animal welfare preference might not have captured all relevant dimensions of this preference. Further analyses will have to take into account further sociodemographic variables, namely education and income, which are usually associated with ethical buying behavior.

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## References

- Harper, G.C., Makatouni, A. (2002). Consumer perception of organic food production and farm animal welfare. *British Food Journal*, 104(3/4/5): 287 – 299
- Hasselbach, J. L., & Roosen, J. (2015). Consumer Heterogeneity in the Willingness to Pay for Local and Organic Food. *Journal of Food Products Marketing*, 21(6): 608-625.
- Henseleit, V. M., Kubitzki, S., Schotz, D., & Teuber, R. (2007). Consumer preferences for locally produced foods - A representative analysis of the influencing factors. *Berichte über Landwirtschaft*, 85(2): 214-237.
- Hole, A. R. (2007). Fitting mixed logit models by using maximum simulated likelihood. *The Stata Journal*, 7(Number 3,): 388-401.
- Kuhnert, H., Feindt, P. H., Wragge, S., & Beusmann, V. (2003). Nachfrage nach Öko-Lebensmitteln: Veränderung durch BSE?. *Ökologie & Landbau, Jahrbuch Öko-Landbau 2003*, 125(1/2003), 29-32.
- Lagerkvist, C. J., & Hess, S. 2010. A meta-analysis of consumer willingness to pay for farm animal welfare. *European Review of Agricultural Economics*, 38(1): 55-78.
- Liljenstolpe, C. (2008). Evaluating animal welfare with choice experiments: an application to Swedish pig production. *Agribusiness*, 24(1), 67-84.
- Louviere, J. J., Flynn, T. N., & Carson, R. T. (2010). Discrete choice experiments are not conjoint analysis. *Journal of Choice Modelling*, 3(3), 57-72.
- Louviere, J. J., & Woodworth, G. (1983). Design and analysis of simulated consumer choice or allocation experiments: an approach based on aggregate data. *Journal of Marketing Research*, 20(4) 350-367.
- Loureiro, M. L., & Hine, S. (2002). Discovering niche markets: A comparison of consumer willingness to pay for local (Colorado grown), organic, and GMO-free products. *Journal of Agricultural and Applied Economics*, 34(03), 477-487.
- Lusk, J. L., & Briggeman, B. C. (2009). Food values. *American Journal of Agricultural Economics*, 91(1), 184-196.
- Onozaka, Y., & McFadden, D. T. (2011). Does local labeling complement or compete with other sustainable labels? A conjoint analysis of direct and joint values for fresh produce claim. *American Journal of Agricultural Economics*, 93(3), 693-706.
- Roosen, J., Lusk, J. L., & Fox, J. A. (2003). Consumer demand for and attitudes toward alternative beef labeling strategies in France, Germany, and the UK. *Agribusiness*, 19(1), 77-90.
- Spiller, A., Gauly, M., Balmann, A., Bauhus, J., Birner, R., Bokelmann, W., Christen, O., Entenmann, S., Grethe, H., Knierim, U., Latacz-Lohmann, U., Martinez, J., Nieberg, H., Qaim, M., Taube, F., Tenhagen B.-A. & Weingarten, P. (2015). Wege zu einer gesellschaftlich akzeptierten Nutztierhaltung. Gutachten des Wissenschaftlichen Beirats für Agrarpolitik beim Bundesministerium für Ernährung und Landwirtschaft. *Berichte über Landwirtschaft, Sonderheft 221*.
- Train, K. E. (2009). *Discrete choice methods with simulation*: Cambridge university press.

- Umberger, W. J., Feuz, D. M., Calkins, C. R., & Sitz, B. M. (2003). Country-of-origin labeling of beef products: U.S. consumers perceptions. *Journal of Food Distribution Research*, 34(3), 103-116.
- Zander, K., & Hamm, U. (2010). Consumer preferences for additional ethical attributes of organic food. *Food Quality and Preference*, 21(5), 495-503.
- Zenner, S., Wirthgen, B., & Altmann, M. (2005). Präferenzen für unterschiedliche Produktionsverfahren und Herkunftsbezeichnungen—dargestellt am Beispiel eines Lebensmittels aus der Direktvermarktung. *Agrarwirtschaft*, 54(2), 112-118.
- Zepeda, L., & Deal, D. (2009). Organic and local food consumer behaviour: Alphabet theory. *International Journal of Consumer Studies*, 33(6), 697-705.