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## Article

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# Determinants of Consumers' Willingness-to-pay for Fairly-produced, Locally Grown Dairy Products

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## Abstract

*At the end of the last decade, several regional marketing projects were launched in the dairy sectors of various Alpine countries with the aim of creating a higher added value for milk products and allowing fair prices for the dairy farmers involved. The projects wanted to offer an alternative marketing channel for the farms in these regions by marketing 'fairly-produced, locally grown products'. The aim of this study is to analyze the determinants of consumers' willingness-to-pay (WTP) for fairly-produced, locally grown products using two different WTP measures: the first one describes a more general willingness-to-pay ( $WTP_{GEN}$ ) and the second one quantifies the price premium ( $WTP_{QUAN}$ ) respondents are willing to pay. The influence of both person-related and environmental factors, which are known to have an impact on food-related consumption behavior, was determined introducing and using the Shapley value (SV) decomposition of  $R^2$ . This concept is commonly used in the commercial marketing context, but until now it has rarely been applied in academic research on food-related consumption behavior, even though it provides interesting advantages. The results show that consumers' WTP for fairly-produced, locally grown products is influenced by person-related factors as well as by environmental factors. In the case of  $WTP_{QUAN}$ , a dominant influence by consumers' price consciousness can be observed, while a higher relative importance of the more global constructs of norms, stated preferences, and values can be detected when explaining  $WTP_{GEN}$ .*

## Key Words

willingness-to-pay; Shapley value; price consciousness; dairy farmers; marketing projects

## 1 Introduction

Today, many people in western European countries have a critical attitude towards modern agricultural production systems (ZANDER et al., 2013a: V). In spite of this, the vast majority of Europe's citizens

(90%) consider agriculture and rural areas to be (very) important for Europe's future (TNS OPINION AND SOCIAL, 2010: 8). Europeans are also aware of the problems that farmers struggle with. For example, in 2012 almost 80% of a representative sample of the German population aged 14+ agreed that the agricultural sector is facing (big) problems due to insecure prices and incomes (IMA, 2012: 14).

The price and income situation of farmers, particularly with respect to the dairy sector, was widely discussed by the public at the end of the last decade in several European countries in the Alpine region (e.g., Austria and Germany). This was sparked by milk delivery boycotts by dairy farmers (2008, 2009), protest activities by different agricultural groups, and media reports concerning the increasing consumer prices of dairy products. At this time, several marketing projects for locally grown dairy products were developed in the German and Austrian dairy sectors, which were mainly aimed at creating a higher added value for milk products, thus allowing "fair" (in this context understood as higher) milk prices for farmers. The strategies, which aimed to guarantee these fair milk prices for the farmers involved, differed between the projects. There were some projects which linked the premium to specific production standards (e.g. GM-free), while others equalize "fairness" solely with the voluntary support of farmers (KLEIN and MENRAD, 2011: 355ff.), since these 'need' a fair milk price. Especially in Germany, this "fair" milk price was claimed from specific producer groups to be at 40 Cent, since this milk price allows a cost-covering remuneration for most of the producers. In this study, we are particularly interested in the second type of regional marketing projects which claim to hand on a certain amount of money per unit sold (e.g. 5 cents/liter milk) to the local dairy farmers involved. We refer to products marketed via such projects as 'fairly-produced, locally grown dairy products'.

Studies performed in the context of organic farming have shown that preferences exist for food products containing the attribute "fair prices for our farmers" in some Alpine countries, or that the attribute "fair prices for farmers" can be an additional decision

criterion for choosing specific organic food products (STOLZ et al., 2010; ZANDER and HAMM, 2010; ZANDER et al., 2013b). In the study by ZANDER et al. (2013b: 139), respondents were told that an additional payment of 20 cents per unit would be paid directly to the agricultural producer when buying products bearing “fair price”. Thus, there is some empirical evidence that consumers are, in general, willing to pay for fairly-produced food. These empirical findings are supported by some developments in the food markets. For example, in Germany the sales volume of all fairly and locally produced milk rose from 4.0 million liters in 2008 to 14.8 million liters in 2009 (GfK SE 2010 cited in: LEHNERT, 2010), which indicates that such marketing projects can offer an interesting differentiation strategy, at least for some farmers. However, such concepts do not only have to compete with standard food products but also with other locally grown or organic food products on the market. Because of this competition, it is vital to understand the main determinants of consumers’ willingness-to-pay for fairly-produced, locally grown products. This knowledge forms the basis for the development of suitable marketing strategies and the long-term success of the marketing projects. However, until now there have been few studies analyzing the factors, which influence WTP for such products.

Thus, our aim is to identify the relative importance of different factors influencing consumers’ willingness-to-pay (WTP) for fairly-produced, locally grown dairy products using data from a cross-national study in different regions in Germany, Austria, and Switzerland. In this context, we want to analyze if there are any differences in the determined relative importance of the predictor variables when using different WTP measures. We first test one which describes the general willingness-to-pay ( $WTP_{GEN}$ ) for fairly-produced, locally grown products and a second one which quantifies the premium ( $WTP_{QUAN}$ ) respondents are willing to pay (see section 3). Additionally, we want to introduce a new concept into academic research on food-related consumption behavior, namely the Shapley value (SV) decomposition of  $R^2$ . The SV concept, which is based on co-operative games theory, is commonly used in a commercial marketing context but until now has rarely been applied in academic research in this field. The concept provides interesting advantages, particularly in regression situations with correlated predictor variables, which often exist when working with observational data and which is also the case in our study.

The remainder of this manuscript is structured as follows: in the next section, we give an overview of potential determinants of consumers’ WTP for fairly-produced, locally grown products. We focus on the person-related and environmental factors, which are known to influence food-related consumption behavior. The study design, methodology used to measure the potential determinants as well as the operationalization of the two WTP measures are presented in chapter 3. In chapter 4, we introduce the statistical procedures that have been applied. This is followed by a description of the results of the study, and finally, by a critical discussion of the empirical findings and the applied methodology.

## 2 Determinants of WTP for Fairly-produced, Locally Grown Products

According to STEENKAMP (1993: 401ff.), food-related consumption behavior is influenced by (a) person-related factors, (b) environmental factors, and (c) the properties of the food. In this study, we focused on determinants of types (a) and (b), since we are mainly interested in the WTP for fairly-produced, locally grown dairy products rather than on a physical product and its specific product attributes. Although the boundaries between the determinants described are diffuse, person-related factors include psychological or socio-demographic (SOD) characteristics, while environmental factors include cultural or economic characteristics (STEENKAMP, 1996: 16f.). In this study, we concentrate on attitudes, personal values, price consciousness, and socio-demographic characteristics (person-related factors), as well as on norms and the consumers’ country or region of residence as representatives of environmental factors.

### 2.1 Person-related Factors

It is important to examine the effect of person-related variables, such as relevant attitudes or personal values (VERMEIR and VERBEKE, 2006: 171), particularly in the context of socially responsible (food) consumption behavior. Specific attitudes in the context of this study include attitudes towards agriculture/farmers and attitudes towards the consumers’ own region, since it is more likely that consumers are willing to support a specific branch/professional category that is active in

their own region, if they have a positive attitude to the region and/or the respective branch of activity.

The significance of values for (food-related consumption) behavior is grounded in their function as the most abstract type of social cognition, helping us to understand and know the interpersonal world (GRUNERT and JUHL, 1995: 39f.). According to the values theory developed by the socio-psychologist Shalom H. Schwartz and colleagues (SCHWARTZ, 1992; SCHWARTZ and BILSKY, 1987; SCHWARTZ and BILSKY, 1990), values are “desirable transsituational goals, varying in importance, that serve as guiding principles in the life of a person or other social entity” (SCHWARTZ, 1994: 21). A relationship between values and behavior can be shown in different areas, such as in the field of ethical decision-making (e.g., FRITZSCHE, 1995) or environmentally-friendly behavior (e.g., GRUNERT and JUHL, 1995). Additionally, a number of studies deal with the influence of values on consumer behavior towards socially responsible food products, such as fair trade or organic products (e.g., BAKER et al., 2004; DORAN, 2009; DREEZENS et al., 2005; FERRAN and GRUNERT, 2005). On this basis, we assume that personal values affect WTP for fairly-produced, locally grown dairy products.

As LUSK and BRIGGEMAN (2009: 191) showed and the consumption theory assumes, product price is one of the most important factors when purchasing food products. In the context of socially responsible food consumption behavior, price has also been found to be the main barrier to purchasing (AERTSENS et al., 2009: 1150; DE PELSMACKER et al., 2006: 135). Based on these findings, we hypothesize that the price consciousness of consumers - defined as an individual trait that can differentiate consumers based on the importance they give to price when buying a product (HANSEN, 2013: 238) - has an effect on WTP for fairly-produced, locally grown products.

Socio-demographic variables, such as age or gender, are often included in studies examining food-related consumption behavior (e.g., CRANFIELD et al., 2012; GREBITUS et al., 2013; PADILLA BRAVO et al., 2013). We also take these variables into account, since they show prognostic relevance in other studies dealing with, for example, consumer preferences for or the likelihood of buying locally produced food (e.g. CRANFIELD et al., 2012; HENSELEIT et al., 2007).

## 2.2 Environmental Factors

Norms are rules for beliefs, attitudes, values, and behaviors that are accepted, expected, controlled, and

sanctioned by members of a (sub-)culture or a group. This construct can be attributed to environmental factors, since norms are graded by a specific culture or group and decrease behavioral variance within a social entity (TROMMSDORFF, 2009: 185f.). In our study, we were mainly interested in the influence of normative processes known from region- and country-of-origin (RoO and CoO, respectively) research, as well as norms for fair prices for farmers. The influence of normative processes on origin-effects is explained by OBERMILLER and SPANGENBERG (1989) in their theoretical framework of CoO effects. These authors suggested that the normative processing of origin-information occurs when an origin-relevant norm exists, such as the feeling that there is a duty to support the local economy or to boycott products from specific regions (VON ALVENSLEBEN, 2000: 6). The impact of norms/normative processes in the context of food-related consumption behavior has been demonstrated in several studies. For example, HENSELEIT et al. (2007: 231) proved the positive influence of the norm, “When buying regionally produced food I support domestic agriculture”, on preferences and WTP for food from one’s own region. Similar results were obtained by VON ALVENSLEBEN (2000) and BALLING (2000).

In our context, we additionally assume that some norms exist that are aimed at the perceived fairness of farmer’s prices and which can affect consumer behavior. We base this assumption on several empirical studies indicating that “fair prices for farmers” can be, at least in some countries, an important (additional) decision criterion for organically/sustainably produced food products (STOLZ et al., 2010; ZANDER et al., 2013b). Moreover, there are some theories in the literature that assume that people do not only care about their own payoffs, but also about other peoples’ payoffs. Based on these theories, CHANG and LUSK (2009: 438, 488) found that people are concerned about the distribution of benefits resulting from food purchases and that people exhibit altruistic preferences towards small farmers. These results indicate that people want small farmers to at least get a “fair” share of the profit generated in the food supply chain, which in turn means that they want them to achieve “fair” prices for their products.

In cross-national studies analyzing consumers’ WTP for fairly-produced, locally grown dairy products, it is reasonable to test the effect of the consumers’ country (or in our case the region) of residence for the following reasons: first, the spending per capita for important, socially responsible food categories



**Table 1. Motivational domains of values**

Value domain	Definition
Self-Direction	Independent thought and action – choosing, creating, exploring.
Stimulation	Excitement, novelty, and challenge in life.
Hedonism	Pleasure and sensual gratification for oneself.
Achievement	Personal success through demonstrating competence according to social standards.
Power	Social status and prestige, control or dominance over people and resources.
Security	Safety, harmony, and stability of society, of relationships, and of self.
Universalism	Understanding, appreciation, tolerance, and protection of the welfare of all people and nature.
Conformity	Restraining of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms.
Tradition	Respect, commitment, and acceptance of the customs and ideas that traditional culture or religion provides.
Benevolence	Preservation and enhancement of the welfare of people with whom one is in frequent personal contact.

Source: SCHWARTZ (1994)

varies among different European countries (e.g., spending per capita for Fair Trade products 2008: Switzerland: €22.23, Austria: €7.83, Germany: €2.59 (STATISTA, 2013)); second, the study by ZANDER et al. (2013b: 140) demonstrated that the probability of buying organic food products only increased in some countries (e.g., Germany and Switzerland) and not in others (e.g., Austria, Italy) as a result of using a label which claims “fair prices for farmers”.

### 3 Study Design and Procedure

The data for this study was collected by means of a written mail survey conducted in spring 2009, which dealt with the topic of “fairly-produced, regional dairy products”. The study was conducted in three different countries in the European Alpine area and more specifically within three selected regions, namely, Bavaria (BA), Zurich (ZU), and Upper Austria (UA). These regions were selected because of the high value of multifunctional agriculture as a public good (landscape, tourism) in these areas. Each of these regions is a federal state/canton of Germany, Austria, or Switzerland which had a similar size/share of the population at the time of the survey. Addresses of people older than 18 years were acquired from two address brokers.<sup>1</sup> The overall response rate of the survey was 11.3%. Solely respondents who were regular buyers of milk were included in this study.

As described above, we used two different WTP measures in this study. Firstly, one which describes a more general willingness-to-pay ( $WTP_{GEN}$ ) for fairly-produced, locally grown dairy products and a second one which quantifies the premium ( $WTP_{QUAN}$ ) respondents are willing-to-pay. Each of them was measured with a single item.  $WTP_{GEN}$  was operationalized by the statement: “If it is guaranteed that a certain amount (e.g., 5 cents) is directly transferred to the agricultural producer I am willing to pay more for milk from my own region.” The statement had to be rated on a 5-point scale from 1 (*I totally agree*) to 5 (*I totally disagree*), plus there was an option of *I don't know*.  $WTP_{QUAN}$  was operationalized in the following way: “A 1-liter package of milk costs on average [BA: 79 cents; ZU: 1.65 CHF<sup>2</sup>; UA: 89 cents]. How much are you willing to pay additionally for milk produced in your region, if it is guaranteed that a certain amount is directly transferred to the agricultural producer?”. Possible answers were (BA): *nothing*; *2 cents*; *4 cents*; *8 cents*; *12 cents*; *20 cents*.

To measure personal values, the Schwartz Value Survey (SVS) was used, which is based on SCHWARTZ's (1992) value theory, and is one of the most elaborate and well-developed instruments for this type of work (BRUNSOE et al., 2004: 195). The theory is based on 10 motivational domains of values (see Table 1), represented by 56 single values (SCHWARTZ, 1994: 56).

Due to time and space restrictions in our survey, we measured personal values with a shortened version

<sup>1</sup> BA: Deutsche Post Direkt GmbH, UA/ZU: Quadress GmbH

<sup>2</sup> ZU: exchange rate at 13 February 2009 of 1 CHF = €0.66975

of the SVS following BRUNSOE et al. (2004), who shortened the original value list to 30 items based on three criteria, including relevance regarding food, demonstrated cross-cultural validity, and representation of all 10 value domains. We expanded BRUNSOE et al. (2004: 199)'s list by five additional value items (social justice, responsibility, social recognition, sense of belonging, health), which could possibly have been important to our research question. Analogous to BRUNSOE et al. (2004: 198), substantives were used in the questionnaire to describe the values (e.g., obedience). Within the survey respondents were asked to rate the values "as guiding principle in my life" on a 9-point scale from -1 (*opposed to my values*) to 7 (*of supreme importance*), with 0 as *not important*. The scale reflects the discriminations individuals make when thinking about the importance of a value (BARDI and SCHWARTZ, 2003: 1210).

The operationalization of the different independent variables can be seen in Table A of the Appendix. Price consciousness was measured by directly asking about the importance of price when purchasing food. This is a procedure often used in market research practice (DILLER, 2008: 103). Attitudes were measured with several items to cover all of the relevant aspects (i.e., attitude towards own region, towards agriculture, specific attitude towards dairy farmers). Norms were measured with nine different items (wording see Table 4) dealing with arguments for fair prices for farmers as well as with arguments for buying locally. Respondents had to rate the statements for the norms and attitudes on a 5-point scale from 1 (*I totally disagree*) to 5 (*I totally agree*), plus there was an option of *I don't know*. In addition, two variables were included in the analysis, which directly measured the stated preferences for buying products from one's own region as well as buying food products from a farmer one personally knows.

## 4 Applied Methodology

To extract independent norm-factors, a principal component analysis (PCA) was conducted on the basis of the ratings of the items for the norms, using an oblique rotation (promax). The main goal of the PCA is the reduction of the dimensionality of a data set, which contains a number of interrelated variables, in a way that as much of the variation is maintained as possible. This is realized by transformation to a new set of uncorrelated variables, the principal components (PC), which are ordered so that the first few PC

maintain most of the variation existing in the original variables (JOLLIFFE, 2002: 1).

To obtain initial insight into the direction and strength of the relationship between the different potential determinants and the dependent variables, pairwise correlation analysis was used.

Our main focus in this study was to identify the relative importance of different determinants of WTP<sub>GEN</sub> and WTP<sub>QUAN</sub> on the basis of an underlying linear regression model. If all independent variables in our model were uncorrelated, this could be easily done by using, e.g., the squared values of the  $\beta$ -coefficients, since the sum of these squared coefficients would be equal to the overall  $R^2$  of the model (GfK RESEARCH CENTER OF EXCELLENCE, n.d.: 2f.). However, predictor variables are mostly correlated and thus it is a challenge to assign the relative importance to the set of predictor variables (GRÖMPING, 2007: 139). In this situation, LIPOVETSKY and CONKLIN (2001: 320) suggest an approach that is based on cooperative game theory. These authors claim that one can think of the model as a way of building coalitions among players (predictors) to maximize the total value, being in this case the quality of the model's fit. A useful tool here is the Shapley value (SV), which creates a score for each player in a game that represents that player's contribution to the total value of the game (GfK RESEARCH CENTER OF EXCELLENCE, n.d.: 7). The SV concept was originally proposed by SHAPLEY (1953). It satisfies three axioms: symmetry, no inessential players, and additivity. This means, that every player should be treated symmetrically within the estimation and that players contributing nothing to the value of any coalition do not receive any power. The last aspect implies that the power originating from every single potential coalition can be added to find the total value (ALBRECHT et al., 2002: 731).

As mentioned above, we want to explain the WTP<sub>GEN</sub>/WTP<sub>QUAN</sub> with a linear regression model:

$$y_i = \beta_0 + \beta_1 x_{i1} + \dots + \beta_k x_{ik} + \varepsilon_i$$

where  $y$  is the dependent variable and where the response of object  $i$  is modelled as a linear function of the set of predictor values  $K = \{x_{i1}, \dots, x_{ik}\}$  (described above), with unknown coefficients  $\beta_1, \dots, \beta_k$ , and an unknown error term  $\varepsilon_i$ . Our full model, including all potential determinants, produces a particular "worth", the  $R^2$ , and our goal is to distribute this worth among all predictor variables. To calculate the SV, the starting point is the full model. Then successively, that is one by one and according to a specific sequence of the variables, predictors are removed from the model.

The difference in our goodness of fit measure,  $R^2$ , which is associated with the elimination of a specific influencing factor, can be interpreted as the variable's marginal contribution to the model fit for this particular sequence of predictors. If all sequences are treated as equally probable, then the SV for one specific influencing factor equals this variable's average marginal contribution over all possible sequences (HUETTNER and SUNDER, 2012: 1240ff.).

Expressed in a mathematical way:  $\theta$  is a permutation of all potential influencing factors, where the predictor  $x_j$  is located in the position  $\theta(j)$  in  $\theta$ . The set of influencing variables located before  $x_j$  is  $P(\theta, x_j) := \{p \in K \mid \theta(p) < \theta(j)\}$ . In the permutation  $\theta$ , the marginal contribution of the specific influencing factor  $x_j$  can be described by (HUETTNER and SUNDER, 2012: 1241ff.):

$$MC(x_j, \theta) := f(P(\theta, x_j) \cup \{x_j\}) - f(P(\theta, x_j)) \quad (1)$$

Now, the SV of the specific influencing factor  $x_j$  can be calculated by the following formula:

$$SV_{x_j}(f) = \frac{1}{|\Theta(K)|} \sum_{\theta \in \Theta(K)} MC(x_j, \theta) \quad (2)$$

where  $\Theta(K)$  is the set of all  $|K|!$  permutations of  $K$ .

## 5 Results

### 5.1 Sample and Description of Potential Influencing Factors

Our analysis is based on the responses of 596 regular buyers of milk. Almost half of the respondents were from Bavaria (see Table 2) and nearly two-thirds were women, which is due to the fact that women are still mostly responsible for the purchase of food in households. For example, in Germany in 2010, 68% of the people mainly or partly responsible for the purchase of food in households were women (VERBRAUCHER-ANALYSE, 2010). The age distribution shows that almost no young people (<25 years) could be reached

by the survey. Most respondents fell into level 3 or 4 of the International Standard of Classification of Education (ISCED) 1997, which means that they had an (upper) secondary or post-secondary non-tertiary education (UNESCO, 2006: 16).

In the following, the dependent variables as well as the potential influencing factors will be characterized using descriptive statistics. The missing values (including *don't knows*) were replaced with the median or mean value of the variables, respectively. Overall, respondents expressed a very high  $WTP_{GEN}$ : 80% (totally) agreed with the statement that they would pay more for milk from their own region if it is guaranteed that a certain amount is directly transferred to the agricultural producer. The stated  $WTP_{QUAN}$  is on average 10.1% (standard deviation: 7.5%) of the presented average price in the respective region (see Appendix, Table A). Thus, for example, the Bavarian interviewees stated an average  $WTP_{QUAN}$  of 8 cents.

Respondents had on average a medium to high price consciousness and a (very) positive attitude towards the region they live in as well as towards agriculture in general. Additionally, they thought that the prices dairy farmers get for their products are too low. Moreover, interviewees stated medium to high preferences for buying products from their own region and claimed that they try to buy products from farmers they know (see Appendix, Table A).

The value profiles of the respondents can be seen in Table 3, which depict the mean importance scores of the single values constituting each domain (see SCHWARTZ and BILSKY, 1990: 889).

Cronbach's alpha values demonstrate that all domains showed adequate internal consistency with almost all of the values being larger than the acceptable lower bound of 0.7.

The most important value domains for the respondents are benevolence (BEN), security (SEC), and universalism (UNI). Thus, the welfare of people with whom one is in frequent contact, the safety and stabil-

**Table 2. Region of residence and socio-demographic characteristics of the sample**

	(%)		(%)		
Region (n = 596)	Bavaria	48.6	Education (n = 571) <sup>1</sup>	ISCED 0–2	17.6
	Upper Austria	28.9		ISCED 3, 4	57.4
	Zurich	22.5		ISCED 5, 6	25.0
Age (n = 571)	19–24 years	0.7	Sex (n = 575)	Women (0)	63.0
	25–49 years	48.5		Men (1)	37.0
	50 years and older	50.8			

<sup>1</sup>Level: 0-2: Pre-primary education to lower secondary education; level 3-4: (upper) secondary education to post-secondary education; level 5-6: First stage of tertiary education to second stage of tertiary education (leading to an advanced research qualification).

Source: KLEIN (2011)

**Table 3. Value profile of the respondents**

Value Domain	SDI	STI	HEDO	ACH	POW	SEC	CON	TRA	BEN	UNI
Mean	4.9	3.4	5.3	5.0	4.4	6.1	4.8	4.1	6.2	6.0
Std. Dev.	1.22	1.45	1.06	1.21	1.26	0.92	1.34	1.56	0.84	0.91
Cronbach's alpha	0.646	0.754	0.724	0.768	0.791	0.777	0.734	0.737	0.817	0.736

-1 = opposed to my values, 0 = not important to me, 7 = of supreme importance

Source: KLEIN (2011)

ity of society and relationships, as well as the welfare of all people and the natural environment were very important to the respondents. In contrast, the least important value domains for the respondents were stimulation (STI) and tradition (TRA), showing that excitement and challenge in life as well as the respect for and acceptance of traditional customs and ideas were less important to the people surveyed.

As described above, a principal component analysis was conducted based on the ratings for the nine single items to extract norm factors. Both the Kaiser criterion (target: eigenvalue > 1) as well as the screeplot suggested a 3-factor solution (see Table 4). Factor 1 and factor 2 represent different aspects of the price fairness norm. Items claiming "fair prices" for farmers due to their broader function for society (e.g., cultivation of the landscape, safeguarding jobs) load on factor 1. Items requesting "fair prices" to ensure the pro-

duction of "good" food, for example, tasty and high quality food, load particularly on the second factor. Additionally, factor 3 typifies the norm of "buy local". Items describing the added value connected with buying local load on this factor (e.g., preservation of the environment and landscape). The three extracted factors explain in total almost 72% of the variance, although a dominance by the first factor can be observed, as it explains 43% of the variance. The calculated Cronbach's alpha values confirm the internal consistency of the three factors.

## 5.2 Determinants of WTP for Fairly-produced, Locally Grown Dairy Products

Table 5 summarizes the pairwise correlations between potential determinants of WTP<sub>GEN</sub> and WTP<sub>QUAN</sub> and both dependent variables. The relationship between

**Table 4. Deduced normative factors (rotated component matrix)**

Item	Factor loading		
	Factor 1	Factor 2	Factor 3
<b>Factor 1: Fairness-Norm I—Broader functions of agriculture</b>			
The agricultural sector has to be supported in terms of money, since it is part of our rural culture.	<b>0.864</b>	-0.054	0.036
Farmers have to receive "fair prices" for their products to safeguard jobs on family farms.	<b>0.742</b>	0.223	-0.098
Farmers have to receive "fair prices" for their products to preserve our cultivated landscape.	<b>0.836</b>	0.017	0.0409
<b>Factor 2: Fairness-Norm II—Production of good food</b>			
Farmers have to receive "fair prices" for their products to enable the production of high quality food.	0.026	<b>0.873</b>	-0.017
Farmers have to receive "fair prices" for their products to ensure the production of healthy and not-contaminated food.	0.026	<b>0.907</b>	0.057
Farmers have to receive "fair prices" for their products to enable the production of tasty food.	0.219	<b>0.623</b>	0.007
<b>Factor 3: Added value when buying local</b>			
When buying milk from the region [e.g., Bavaria], one saves transport distances and thus preserves the environment.	0.224	0.185	<b>0.856</b>
When buying milk from the region [e.g., Bavaria] I help to preserve the landscape in the region [e.g., Bavaria].	0.303	-0.145	<b>0.723</b>
When buying milk from the region [e.g., Bavaria] I support the domestic agricultural sector.	0.06	-0.025	<b>0.823</b>
Eigenvalue	3.86	1.58	1.02
Explained variance (%)	42.9	17.5	11.3
Cronbach's alpha	0.77	0.81	0.75
Explained total variance: 71.8%; KMO = 0.815; smallest MSA: 0.7552; highest MSA: 0.8966			

KMO = Kaiser-Mayer-Olkin criterion; MSA = measure of sampling adequacy

Source: KLEIN (2011)



both dependent variables is positive and medium to large ( $r = 0.5195$ ), although they do not correlate perfectly. The relationships between these two variables and the value domains are predominantly positive but weak, with the highest correlations existing with the domains TRA, BEN, and UNI in the case of  $WTP_{GEN}$ , and with UNI and TRA in the case of  $WTP_{QUAN}$ . Both dependent variables correlate negatively with price consciousness and positively with the stated preference variables. The relationship between price consciousness and  $WTP_{QUAN}$  ( $r = -0.3647$ ) is stronger than between the same variable and  $WTP_{GEN}$  ( $r = -0.2474$ ). In the case of the stated preferences, we found the reverse situation. Furthermore, mainly medium-high correlations can be observed between attitudes, norms, and the dependent variables, while correlations are weak in the case of the socio-demographic variables, as well as the respondents' region of residence. In the latter case, we found differences between the three regions: being citizen of Bavaria correlates positively with both WTP measures, while

the correlation is negative if respondents live in Zurich or Upper Austria. Overall,  $WTP_{GEN}$  correlates the strongest with price fairness-norm I ( $r = 0.3721$ ), whereas  $WTP_{QUAN}$  correlates the strongest with price consciousness of respondents ( $r = -0.3647$ ).

Furthermore, Appendix Table B provides pairwise correlations between all independent variables. It shows that medium to high correlations between our potential determinants of  $WTP_{GEN}/WTP_{QUAN}$  partly exist, even though the calculated Variance-Inflation-factors (VIF) do not indicate the existence of a multicollinearity-problem ( $VIF_{max}=2.55$ ;  $VIF_{mean}=1.77$ ). Thus, we have a regression situation with correlated predictor variables, in which it is interesting to use the SV concept.

To analyze the relative importance of different determinants of  $WTP_{GEN}$  and  $WTP_{QUAN}$ , we calculated SV with R package relaimpo (relative importance metrics for linear models) by decomposing the  $R^2$  of two linear regression models. The statistical package allows the assessment of six different metrics for

**Table 5. Pairwise correlations between  $WTP_{GEN}$  and  $WTP_{QUAN}$  as well as potential determinants**

			$WTP_{GEN}$	$WTP_{QUAN}$
Dependent Variable		$WTP_{GEN}$	0.5195*	1
		$WTP_{QUAN}$	1	0.5195*
Person-related factors	Values	SDI	0.1144*	0.0794
		STI	-0.0234	-0.0320
		HEDO	0.1163*	0.0534
		ACH	0.0486	-0.0267
		POW	0.0982*	-0.0040
		SEC	0.1051*	0.0233
		CON	0.1231*	0.0292
		TRA	0.1973*	0.1322*
		BEN	0.1759*	0.0801
		UNI	0.1573*	0.1636*
	Price consciousness	Price consciousness	-0.2474*	-0.3647*
	Stated preferences	Preferences for buying from own region	0.3067*	0.2427*
		Preferences for buying from familiar farmer	0.3387*	0.2689*
	Attitudes	Attitude towards region	0.2065*	0.1375*
		Attitude towards agriculture	0.2635*	0.2286*
		Specific attitude towards dairy farmer (prices)	-0.3256*	-0.3376*
	Socio-demographic variables	Gender (man=1)	-0.0925*	-0.1108*
		Age	0.1012*	-0.0119
		Education	-0.0881*	-0.0689
Environmental factors	Norms	Broader Function of agriculture (fairness-norm I)	0.3721*	0.2930*
		Production of "good food" (fairness-norm II)	0.2423*	0.3099*
		Added value buying local	0.2840*	0.2188*
	Region	Bavaria	0.1235*	0.1667*
		Upper Austria	-0.0237	-0.0901*
		Zurich	-0.1222*	-0.1018*

\*significant at  $\alpha=0.05$

Source: own calculations

assessing the relative importance of predictors in linear models, as well as the computation of bootstrap confidence intervals (GRÖMPING, 2006). The metric *lmg* was applied to calculate the SVs in our study. The metric is called *lmg*, due to the proposition of Lindeman, Merenda, and Gold (1980) (GRÖMPING, 2006: 2). The same metric was proposed by Lipovetsky and Conklin (2001) as the Shapley value (GRÖMPING, 2009: 310).

Table 6 shows the calculated SVs of all potential predictors in absolute terms as well as in normalized form. The overall  $R^2$  was 0.3595 in the case of the  $WTP_{QUAN}$  and 0.3388 in the case of the  $WTP_{GEN}$  model.

In the  $WTP_{GEN}$  model, the predictors with the highest relative importance in explaining the dependent variable's variance were the fairness-norm I "broader function of agriculture" (17.5%), price consciousness (15.4%), the specific attitude towards the prices dairy farmers get for their products (11.6%), and the stated preference for buying food from a per-

sonally-known farmer (11.4%). Additionally, those with relatively high importance were the stated preferences for buying food from their own region (7.4%), overall attitude towards agriculture (5.6%), and the norm for buying locally (5.6%). In the case of  $WTP_{QUAN}$ , the high importance of price consciousness is obvious (30.7%). Further important predictors were again the specific attitude towards the prices dairy farmers get for their products (13.2%), both dimensions of the fairness-norm (9.0%, 9.6%, respectively), as well as the stated preference for buying food from a personally-known farmer (6.3%). The relative importance of the different personal values was very low in both models; the domains with the highest importance were BEN and TRA in the  $WTP_{GEN}$  model and UNI and TRA in the  $WTP_{QUAN}$  model.

Additionally, we calculated aggregated SVs for the different groups of potential influencing factors, namely, SOD, attitudes, values, preferences, norms, and region of residence. Therefore, the relative im-

**Table 6. SV decomposition of the  $WTP_{GEN}$  and  $WTP_{QUAN}$  model**

Group	Regressor	$WTP_{GEN}$		$WTP_{QUAN}$	
		SV (abs.)	SV (normalized)	SV (abs.)	SV (normalized)
Values	SDI	0.0057	1.7%	0.0030	0.8%
	STI	0.0022	0.6%	0.0007	0.2%
	HEDO	0.0054	1.6%	0.0014	0.4%
	ACH	0.0029	0.8%	0.0047	1.3%
	POW	0.0026	0.8%	0.0010	0.3%
	SEC	0.0045	1.3%	0.0034	0.9%
	CON	0.0021	0.6%	0.0015	0.4%
	TRA	0.0066	2.0%	0.0039	1.1%
	BEN	0.0102	3.0%	0.0011	0.3%
	UNI	0.0042	1.2%	0.0064	1.8%
Price consciousness	Price consciousness	0.0520	15.4%	0.1105	30.7%
Stated preferences	Preferences for buying from own region	0.0252	7.4%	0.0163	4.5%
	Preferences for buying from familiar farmer	0.0385	11.4%	0.0228	6.3%
Attitudes	Attitude towards region	0.0117	3.4%	0.0044	1.2%
	Attitude towards agriculture	0.0188	5.6%	0.0164	4.6%
	Specific attitude towards dairy farmer (prices)	0.0392	11.6%	0.0474	13.2%
Socio-demographic variables	Gender	0.0021	0.6%	0.0039	1.1%
	Age	0.0026	0.8%	0.0049	1.4%
	Education	0.0017	0.5%	0.0028	0.8%
Norms	Broader function of agriculture (fairness-norm I)	0.0593	17.5%	0.0324	9.0%
	Production of "good food" (fairness-norm II)	0.0129	3.8%	0.0347	9.6%
	Added value of buying local (ROO-norm)	0.0189	5.6%	0.0104	2.9%
Region	Bavaria	0.0064	1.9%	0.0171	4.8%
	Upper Austria	0.0030	0.9%	0.0084	2.3%
<b>Total</b>		<b>0.3388</b>	<b>100.0%</b>	<b>0.3595</b>	<b>100.0%</b>

Source: own calculations

portance was only allocated between groups of predictors, and no subdivision within groups was calculated (relaimpo). Moreover, bootstrap confidence intervals (CI: 95%,  $b = 2000$  replications) of the group SVs were calculated to attach greater reliability when compared to the importance of the different groups (HUETTNER and SUNDER, 2012: 1246). Figure 1 provides the calculated group SVs (absolute) as well as the 95% bootstrap confidence intervals and the normalized SVs of the  $WTP_{GEN}$  and  $WTP_{QUAN}$  model.

In the case of the  $WTP_{GEN}$  model the most important predictor groups were norms, attitudes, and stated preferences. However, the CI for all three groups overlapped with the CI for other groups, so one cannot generalize which of these groups was clearly the most important one for explaining  $WTP_{GEN}$ . In contrast, the SOD group and the variables indicating the respondents' region of residence were those groups which explained the smallest portion of the dependent variables variance. Additionally, their CIs show that these two groups were clearly the least important ones, when explaining  $WTP_{GEN}$ .

Price consciousness, attitudes, and norms were the predictor groups that explained the highest portion of the variance of the consumers'  $WTP_{QUAN}$ . The CIs of the SV of these three variable groups overlapped and thus it is not possible to identify a fully reliable importance ranking for these groups. However, price consciousness was clearly more important than values, stated preferences, SOD variables, and region of resi-

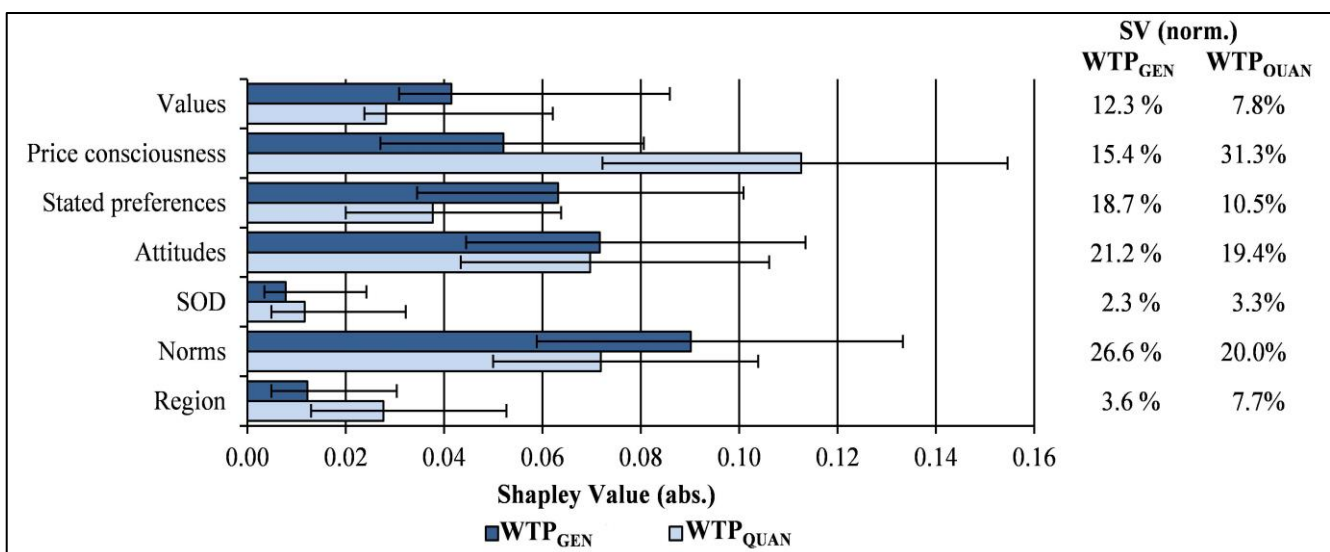
dence. Moreover, SOD were less important than attitudes or norms.

When comparing the relative importance of the different variable groups to explain  $WTP_{GEN}$  and  $WTP_{QUAN}$ , it is obvious that price consciousness had a greater influence on  $WTP_{QUAN}$  than on  $WTP_{GEN}$ , while this was reversed for values, stated preferences, and norms. Attitudes explained a similar portion of the variance of the dependent variables in both models.

## 6 Discussion and Conclusions

The emergence of regional marketing projects claiming "fair prices" for local dairy farmers in some European Alpine regions was the motivation for this study, which investigated the relative importance of different determinants influencing consumers' WTP for fairly-produced, locally grown dairy products. The contribution made by this study is the provision of comprehensive insight into the main determinants of consumers' WTP for fairly-produced, locally grown dairy products using two different WTP measures: one which describes a more general willingness-to-pay ( $WTP_{GEN}$ ) and one which quantifies the premium ( $WTP_{QUAN}$ ) respondents are willing to pay. Additionally, we introduced and applied SV decomposition of  $R^2$ , a concept based on co-operative game theory, which to our knowledge, had not been used before in academic research on food-related consumption

**Figure 1. Aggregated and normalized SVs for different groups of predictor variables in the  $WTP_{GEN}/WTP_{QUAN}$  model**



Bootstrap confidence intervals (CI: 95%,  $b = 2000$  replications) provided.  
Source: own calculations

behavior. The concept is especially helpful in regression situation with correlated predictor variables, which is the case in our study. Overall, we found that both  $WTP_{GEN}$  and  $WTP_{QUAN}$  are influenced by person-related factors of the respondents, as well as by environmental factors. In the case of  $WTP_{QUAN}$  a dominant influence of the price consciousness of consumers can be observed, while a higher relative importance of the more global construct of norms, stated preferences, and values can be detected when explaining  $WTP_{GEN}$ . Thus, the importance of the predictor variables differs when different WTP measures are used.

One of the main findings of this study is the high importance of consumers' price consciousness in  $WTP_{QUAN}$ . The pairwise correlations show that the more importance consumers attach to price when purchasing food, the less willing they are to pay. This is in line with other studies showing that price has a negative effect on respondents' purchasing decisions (see e.g., ANDORFER and LIEBE, 2012) and is deemed to be the main barrier to purchasing food with an ethical dimension (AERTSENS et al., 2009: 1150). What is interesting in this respect is the comparison with the  $WTP_{GEN}$  results. The price consciousness variable exhibits the second highest SV in this model, but the normalized SV of this predictor in the  $WTP_{GEN}$  model is only half of the SV (normalized) in the  $WTP_{QUAN}$  model, indicating that the relative importance of price consciousness explains a much lower part of the variance in that model. The reverse is the case for other determinants, as values and norms explain a higher portion of variance in the  $WTP_{GEN}$  model. There are two possible explanations for this result. The first refers to the different scale formats which were used to measure both variables. In the case of  $WTP_{GEN}$ , respondents had to answer on a 5-point scale from *I totally agree* to *I totally disagree*, while in the case of  $WTP_{QUAN}$  interviewees had to state the premium they are willing to pay. The second explanation refers to the findings of the meta-analysis of KIM and HUNTER (1993: 101) who showed that the higher the attitudinal relevance of a variable, the stronger the relationship between attitudes and behavior is. Transferring this to our study, it can be assumed that the price consciousness related to food has a higher direct relevance for  $WTP_{QUAN}$  than for  $WTP_{GEN}$  because consumers have to state exactly how much more money (e.g., nothing, 2 cents, etc.) they are willing to pay, whereas they were only asked for a general willingness to pay in the case of  $WTP_{GEN}$ .

A further interesting finding in our study is related to norms on fair prices for farmers. We argued and were able to show that the perceived fairness of producer prices can affect WTP for fairly-produced, locally grown products. We found that the norm on fair prices has two dimensions related to the functions of agriculture in society. Firstly, consumers believe that fair producer prices are necessary for farmers to fulfill their original function, that is, to ensure the supply of "good" food for society. Secondly, we also found that the broader functions of the sector, such as preservation of the landscape and rural culture, are valued and have significant explanatory power in both models. This finding can be used to elaborate the content and message for the information and communication strategies for such marketing projects, since it seems helpful to point out the "added-value" of the agricultural sector for society (protection of cultural landscape, safeguarding of employment in rural areas, value for tourism etc.) in addition to the specific product attributes.

Personal values only explain a small portion of the variance in our models, but nevertheless some value domains clearly correlate more positively with the dependent variables. These are TRA, UNI, and BEN, which are value domains serving collectivistic interests according to Schwarz's theory. This finding concerning the interest in the welfare of others (BEN, UNI) and the respect for traditions (TRA) is supported by other studies, which have also found a correlation/influence of BEN, UNI, or TRA on socially responsible food consumption behavior, such as sustainable or fair trade products (e.g. CODRON et al., 2006; DORAN, 2009; GRUNERT and JUHL, 1995).

In accordance with the study of ZANDER et al. (2013b), we also found country specific differences, since our WTP-variables correlate positively with being a resident of Bavaria and negatively with living in Upper Austria or in Zurich. Thus, there is some evidence that regional marketing projects claiming fair prices for local dairy farmers are only promising in some regions of Europe.

In this study we introduced and used the SV concept to analyze the relative importance of different potential determinants of  $WTP_{GEN}$  and  $WTP_{QUAN}$ . In the commercial marketing context, the SV concept is often used to identify key drivers for various problems, such as analyzing customer satisfaction or product variations through product and concept tests (CONKLIN et al., 2004; WIRTH and WOLFRATH, 2006:



89ff.). However, this method is rarely used in academic research studies that analyze food-related consumption behavior, even though it offers an attractive diagnostic tool for the identification of important groups of predictor variables in a given regression model (HUETTNER and SUNDER, 2012: 1248). The approach is particularly helpful in regression models with correlated or even multicollinear predictor variables. Such conditions can often be found in observational studies (GRÖMPING, 2007: 139; LIPOVETSKY and CONKLIN, 2001: 319) and can lead to regression coefficients that are unstable or which apparently reverse the direction of influence of a certain explanatory variable (i.e., the “wrong” sign of an estimated coefficient). The SV concept can contribute to the avoidance of such misleading results. This advantage can outweigh one major disadvantage of the method, which is that until now one has had to approximate the statistical quality of the results with bootstrapping approaches (WIRTH and WOLFRATH, 2006: 96). Summing up, in the future this method could be an interesting additional tool for academic researchers to determine the main drivers of food-related consumption behavior.

We implemented the SV concept using the package *relaimpo*, which assess relative importance of different predictor variables in linear regression (GRÖMPING, 2006). The package provides the possibility of calculating relative importance for a group of predictors, the estimation of bootstrap intervals as well as the employment of a large number of predictor variables. The use of this procedure is disputable, since our dependent variables are, technically speaking, not metric but rather censored respectively ordinal. Thus, statistical models other than linear regression (e.g. ordered logistic regression, tobit model) seem to be more appropriate as underlying model for the SV decomposition. However, our procedure is pragmatic and seems defensible for several reasons: In the WTP<sub>QUAN</sub>-model we have, strictly speaking, a left-hand censored dependent variable (censoring at zero), which would suggest a Tobit model. As WILSON and TISDELL (2002: 5) summarize, it is possible that the use of OLS models in the case of censored sample data sets make OLS estimates biased and inefficient. However, these authors also showed that the number of zeroes has to be significantly large for differences in estimates between OLS and Tobit analysis to emerge, which is not the case in our study (% zeroes: 7.9%). The dependent variable in the WTP<sub>GEN</sub>-model is the Likert-type ordinal response style format. In customer satisfaction analysis, where the SV concept is often

applied in the commercial marketing context, such ordinal dependent variables are commonly used (e.g. CONKLIN et al., 2004). However, in academic research it is controversially debated whether these kinds of variables can be used to calculate correlations or regression coefficients. One main concern is that the variables cannot be supposed to be interval scale, since the intervals between values cannot be presumed to be equal (NORMAN, 2010: 627f.). In contrast to this debate, leading educational books in the field of marketing research support the treatment of such scales as if they are equal-interval (DAWES, 2008: 67). Looking in empirical studies one also finds pro and contra arguments for using OLS for these kind of data. For example OWUOR (2001: iii) summarizes that, when interpreting OLS regression results based on Likert-type data, researchers should be aware that reported R<sup>2</sup> and Pearson correlation values can be underestimated, especially if items with two or three scale points are used (which is not the case in our study). However, other studies suggest that the OLS approach evidences predominantly good Type I error control. For instance, KROMREY and RENDINA-GOBIOFF (2003: 30) empirically compared different regression analysis strategies with discrete ordinal variables.

Besides these arguments concerning the dependent variable, CHEVAN and SUTHERLAND (1991: 94f.) were able to show that quite different statistical models produce basically the same results when the respective measures of fit are decomposed. For example, they showed that a linear regression and a log-linear regression resulted in practically the same distribution of independent and joint effects of a set of predictors. To validate this for our data, we exemplarily calculated relative importance using the SV concept based on a Tobit regression and found essentially the same results as described for the linear regression model. Both models identified the same relative variable importance. As mentioned before, it has been shown in other studies already, that the linear regression model and the tobit model lead to the same results when the number of border values, i.e. response variables close to zero, are very low. Our findings support the use of linear regression models for such tasks.

In addition to the debatable points described above, the findings of our research are limited for several reasons. This firstly relates to our restricted sample, particularly since young buyers of milk (<25 years) could not be reached with our survey. Thus, we cannot draw overall conclusions about our target group of

“buyers of milk”. Instead, the results apply to a relatively old sample in three specific Alpine regions. To generalize our findings, it would be necessary to prove in future research projects that similar results can be obtained in other regions and countries. This test is necessary since we concentrated on regions with a high value of multifunctional agriculture as a public good. Thus, it is not possible to simply transfer our insights to regions or countries without important agricultural (and particularly dairy) production. Secondly, our study was conducted at a time of relatively high public awareness about the milk price situation. The years 2008 and 2009 were particularly affected by a continual decrease in milk prices on the world market, which finally led to reduced farmers’ prices in Europe (FAHLBUSCH et al., 2009: 42). This situation, in combination with rising input prices, finally culminated in some European countries (e.g., Austria and Germany) having milk delivery boycotts by dairy farmers, accompanied by a high media interest. Against the background of this situation, it is probable that the respondents were aware of the problem of decreasing producer prices when they were surveyed in the spring of 2009. Thus, it would be interesting to validate this result in circumstances where public awareness on the topic was low. Thirdly, we can “only” explain 36% of the variance of  $WTP_{GEN}$  and 34% of the variance of  $WTP_{QUAN}$  with the help of our model. Thus, it can be assumed that there are additional (groups of) variables which should be considered in this context. These include the properties of the food (e.g., special sensory quality or the nutrient content of the milk product), which represent the third factor discussed in literature that is used to determine food acceptance and behavior (STEENKAMP, 1996: 16). However, there are probably further/other person-related and environmental factors which have an important influence on  $WTP_{GEN}$  and  $WTP_{QUAN}$ , for example, involvement or perceived consumer effectiveness. As VERMEIR and VERBEKE (2006: 184) pointed out, consumers with a high level of involvement or who believe in their personal consumer effectiveness have a higher intention to buy sustainable food products.

Summing up, marketing projects claiming fair prices for local consumers can be an interesting alternative marketing channel for at least a limited number of dairy farmers in some regions (e.g. Bavaria). When developing marketing strategies for such products, it is recommended to take the identified key determinants for  $WTP_{GEN}$  and  $WTP_{QUAN}$  into account. This can help to support the long-term success of these initia-

tives in the market, which is a prerequisite for contributing to the maintenance of the dairy farmers.

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## Appendix

**Table A. Operationalization and description of the different dependent and independent variables**

Variable	Operationalization	Mean	Std. Dev
WTP <sub>GEN</sub> for fairly-produced, locally grown dairy products	If it is guaranteed that a certain amount (e.g., 5 cents) is directly transferred to the agricultural producer I am willing to pay more for milk from my own region. [5 = <i>I totally agree</i> ; 1 = <i>I totally disagree</i> ; plus an <i>I don't know</i> option]	4.1	0.91
WTP <sub>QUAN</sub> for fairly-produced, locally grown dairy products	A 1-liter package of milk costs on average [BA] 79 cents [CH: 1.65 CHF, UA: 89 cents]. How much are you willing to pay additionally for milk produced in your region, if it is guaranteed that a certain amount is directly transferred to the agricultural producer? [BA: nothing, 2 cents (=2.5%), 4 cent (=5.1%), 8 cents (=10.1%), 12 cents (=15.2%), 20 cents (=25.3%); ZU: nothing, 4 (=2.4%) centimes, 8 centimes (=4.8%), 16 centimes (=9.7%), 24 centimes (=14.5%), 40 centimes (=24.2%); UA: nothing, 2 (=2.2%) cents, 4 cents (=4.5%), 9 cents (=10.1%), 13 cents (=14.6%), 22 cents (=24.7%)]	10.1%	7.5%
Price consciousness	How important are the following aspects when buying food: price. [1 = <i>not important at all</i> , 5 = <i>very important</i> ; plus <i>don't know</i> ]	3.5	0.95
Attitude towards agriculture	How would you rate your overall attitude towards agriculture? [1 = <i>very negative</i> to 5 = <i>very positive</i> ; plus <i>don't know</i> ]	4.1	0.74
Attitude towards region	How would you rate your overall attitude towards [region]? [1 = <i>very negative</i> to 5 = <i>very positive</i> , plus <i>don't know</i> ]	4.5	0.66
Specific attitude towards dairy farmers (price)	The prices dairy farmers get for their products are 1 = <i>too low</i> to 5 = <i>too high</i> .	2.0	0.79
Specific attitude towards dairy farmers (subsidies)	Public subsidies for dairy farmers are 1 = <i>too low</i> to 5 = <i>too high</i> .	2.6	0.84
Preferences for buying from own region	Preferably, I try to buy products from [region]. [1 = <i>does not apply at all</i> , 5 = <i>totally applies</i> ; plus <i>do not know</i> ]	3.7	1.00
Preferences for buying from personally known farmer	Preferably, I try to buy food products whose producer I know. [1 = <i>I totally disagree</i> , 5 = <i>I totally agree</i> ; plus <i>do not know</i> ]	3.6	0.97

Source: KLEIN (2011)

**Table B. Pairwise correlations between potential determinants of local farmers**

	SDI	STI	HEDO	ACH	POW	SEC	CON	TRA	BEN	UNI	Price interest	Preferences b. f own region
SDI	1											
STI	0.5024*	1										
HEDO	0.3365*	0.4092*	1									
ACH	0.4201*	0.3663*	0.4587*	1								
POW	0.3523*	0.3622*	0.4578*	0.6983*	1							
SEC	0.1629*	0.0722	0.4070*	0.4461*	0.5099*	1						
CON	0.2241*	0.2057*	0.3798*	0.5242*	0.5875*	0.5872*	1					
TRA	0.2494*	0.1924*	0.3301*	0.3518*	0.4541*	0.4536*	0.6214*	1				
BEN	0.3654*	0.1202*	0.3562*	0.3771*	0.3696*	0.5309*	0.4384*	0.3729*	1			
UNI	0.3457*	0.1118*	0.3247*	0.3106*	0.3240*	0.4860*	0.3851*	0.3923*	0.6136*	1		
Price interest	-0.0854*	0.0556	0.0232	0.1062*	0.1252*	0.2207*	0.2225*	0.0891*	0.0671	-0.0035	1	
Preferences buying from own region	0.0381	0.0111	0.0399	0.0765	0.1340*	0.1868*	0.2007*	0.2784*	0.1047*	0.1915*	-0.0332	1
Preferences buying from familiar farmer	0.0799	-0.0396	0.0751	0.0608	0.1421*	0.1845*	0.1594*	0.2243*	0.1557*	0.2244*	-0.1198*	0.4681*
Attitude towards region	-0.0294	-0.0191	0.0237	0.0883*	0.0753	0.1786*	0.1678*	0.0818*	0.0771	0.0413	0.0222	0.3667*
Attitude towards agriculture	0.0393	-0.0061	0.0820*	0.1527*	0.0909*	0.2258*	0.1730*	0.2491*	0.1746*	0.1960*	-0.0027	0.2992*
Specific attitude towards dairy farmer (prices)	0.0142	0.0860*	-0.0681	-0.0583	-0.0175	-0.1093*	-0.1403*	-0.1769*	-0.0937*	-0.1407*	0.052	-0.2118*
Gender	-0.0355	0.0632	-0.0603	0.0297	0.0182	-0.1014*	-0.0191	-0.1091*	-0.1086*	-0.1432*	-0.0262	-0.0917*
Age	-0.0617	-0.1040*	-0.1203*	-0.0974*	0.033	0.1596*	0.1177*	0.1686*	-0.0182	0.0121	0.0597	0.1330*
Education	0.1169*	0.0655	-0.0806*	0.0009	-0.1239*	-0.2582*	-0.2253*	-0.2328*	-0.0817*	-0.1129*	-0.2162*	-0.1672*
Fairness-norm I	0.0576	0.0285	0.1438*	0.1834*	0.1829*	0.3488*	0.2340*	0.2935*	0.1998*	0.2906*	0.0177	0.2921*
Fairness-norm II	0.1229*	-0.0002	0.1484*	0.1071*	0.0569	0.1658*	0.1166*	0.1640*	0.1492*	0.2846*	-0.1158*	0.1634*
ROO-norm	0.059	-0.025	0.0923*	0.1107*	0.1006*	0.1664*	0.1471*	0.1997*	0.1384*	0.2294*	-0.0135	0.5198*
Bavaria	-0.0553	-0.0961*	-0.1092*	0.0197	0.053	0.1477*	0.2211*	0.1466*	0.0973*	0.0565	0.1277*	0.0735
Upper Austria	-0.1028*	-0.0534	0.0724	0.0438	0.0511	0.0805*	0.0167	-0.0107	-0.0058	0.0427	0.0718	0.2142*
Zurich	0.1778*	0.1730*	0.0522	-0.0711	-0.1190*	-0.2642*	-0.2828*	-0.1639*	-0.1102*	-0.1141*	-0.2308*	-0.3205*

	Preferences b.f. familiar farmer	Attitude towards region	Attitude towards agriculture	Specific attitude (prices)	Gender	Age	Education	Fairness- norm I	Fairness- norm II	ROO- norm	Bavaria	Upper Austria	Zurich
Preferences buying from familiar farmer	1												
Attitude towards region	0.2042*	1											
Attitude towards agriculture	0.2051*	0.2753*	1										
Specific attitude towards dairy farmer (prices)	-0.2168*	-0.1732*	-0.2832*	1									
Gender	-0.0645	-0.0309	-0.0757	0.0573	1								
Age	0.1760*	0.0831*	0.0784	-0.0356	0.0666	1							
Education	-0.1111*	-0.1354*	-0.1378*	0.1488*	0.1525*	-0.1872*	1						
Fairness-norm I	0.2526*	0.1892*	0.3231*	-0.3362*	-0.1307*	0.1748*	-0.1539*	1					
Fairness-norm II	0.1966*	0.1059*	0.1992*	-0.2952*	-0.1363*	0.0706	-0.0347	0.4634*	1				
ROO-norm	0.3932*	0.3167*	0.3064*	-0.2478*	-0.1208*	0.0672	-0.0955*	0.3151*	0.2141*	1			
Bavaria	0.0866*	0.0931*	0.0317	-0.1950*	-0.0535	0.1638*	-0.2007*	0.0442	0.0455	0.0104	1		
Upper Austria	0.1227*	0.1388*	0.0891*	-0.0361	-0.0654	-0.0836*	-0.0783	0.0961*	0.0326	0.1735*	-0.6200*	1	
Zurich	-0.2369*	-0.2621*	-0.1347*	0.2726*	0.1351*	-0.1054*	0.3252*	-0.1573*	-0.0899*	-0.2007*	-0.5243*	-0.3430*	1

\*Significant at  $\alpha=0.05$

Source: own calculations