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Quality expectation and taste experience**

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# **Can COO labeling be a means of pepper differentiation: Quality expectation and taste experience**

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## **Abstract**

Country of Origin (COO) labeling has been shown in several studies to be an important extrinsic cue for consumers in their quality evaluation of food products such as olive oil. COO has not been discussed in the context of pepper; a spice which's quality is highly dependant on its heritage. This is the first study that combines face-to-face interviews regarding attitudes, image and knowledge with a blind tasting of pepper and an investigation of consumer's WTP for pepper from different origins and processing characteristics. The study reveals that organic consumers are able to experience taste differences due to COO. They expect taste differences. But also concerned and involved consumers are not to that extent informed about COO that they rely in their purchase decision on COO information. As a result consumers are not willing to pay a significant higher price for COO labeled pepper.

## **1. Introduction**

The product's freshness (97 %) and taste (93 %) are the most mentioned attributes consumers associate with product quality (GfK 2000). The latter is undetectable before purchase. Nevertheless, there exist two possibilities to evaluate a product's taste without degustation: consumers can make use of pieces of information, so called quality cues to infer to the characteristic taste or they can rely on prior experience (PETZOLDT ET AL. 2007; KROEBER-RIEL and WEINBERG 2003).

Country of Origin (COO) labeling has been shown in several studies to be an important extrinsic cue for consumers in their quality evaluation of food products (e.g. VAN ITTERSUM ET AL. 2001; HONG and WYER 1989; ELLIOTT and CAMERON 1994) such as meat, wine and olive oil (for meat see e.g. VERBEKE and WARD 2006; LOUREIRO and MCCLUSKY 2000, for olive oil e.g. SANDALIDOU ET AL. 2002 and for wine e.g. SKURAS and VAKROU 2002). Spices such as pepper have not been researched yet regarding the relevance of COO labeling. However, pepper for instance seems very interesting to analyze due to two reasons. First, we can note a shift from pepper being a low-involvement commodity to becoming a lifestyle product. This holds especially for consumers of organic products and for gourmets (KAUSCH 2008; BRAUN 2007). Especially, freshly grounded pepper experiences an increasing culinary demand (DEAK 2004). Second, peppers' aroma diversity is determined by its origin which is used in evaluating its quality (BRAUN 2007; MCFADDEN 2008). The original COO of pepper is India, where still 90% is cultivated in traditional homestead plantation. The main pepper export countries of today are Vietnam and Brazil, while India only ranks 4<sup>th</sup>. The pepper sold in Germany is mainly imported from Vietnam (35 %) and Brazil (27 %) with only 6 % coming from India in 2008 (GFA CONSULTING GROUP 2009). The geographical origin of pepper influences its taste. The variety of pepper in color, size, pericarp, amount of essential oils and piperine are due to soil, climate and cropping system (MCFADDEN 2008). Accordingly, pepper experts state that pepper should be differentiated with respect to country and region of origin, as is already common for e.g. wine, tea and coffee (BRAUN 2007; MCFADDEN 2008). At present, however, many pepper varieties are not sold in Germany and those which are, can in most cases not be identified by consumers because they are not COO labeled. In addition, the pepper which can be bought in conventional German retail stores is in general "Hybrid-Pepper", a mixture of different pepper

species as a result of different region of origins and COOs (NATUR and KOSMOS 2007). COO labeled (COOL) pepper is so far primarily available in organic stores. **Organic consumers** are known as conscious and interested in production processes and related issues (e.g. SCHIFFERSTEIN and OUDE OPHIUS 1998; SANAUER 2001) with taste being one of the primary reasons for buying organic food (SCHIFFERSTEIN and OUDE OPHIUS 1998). As research reveals that knowledge is a crucial factor for the use of COO labels as purchase criterion (e.g. SCHÄFER 1997; VAN ITTERSUM ET AL. 2001) we suspect that especially organic consumers know about a products' diversity, e.g. taste variety as a result of its COO, so that they expect taste differences on the one hand, are able to taste pepper's aroma diversity because of COO on the other hand and are ready to chose products with COOL for which they are willing to pay a premium.

The **aim** of this study is to assess whether promoting COOL for pepper from countries and regions that produce high quality peppers could be a successful marketing strategy to garner a premium over other pepper varieties. In addition, we analyze whether taste perception correlates with actual taste and the role of both for the success of COO labeling. Thus, our study is one of the few that consider taste perception and its role in product evaluation actual taste experience and how this is linked to WTP.

The paper is organized as follows. In section 2 the Total Food Quality Model by GRUNERT (1996) is introduced as theoretic framework. Information on the design and sample characteristics of the survey are given in section 3 and 4 while the results of the empirical analysis are presented and discussed in section 5. The final section summarizes the main findings and provides an outlook regarding further research needs.

## 2. Theoretical Background

For consumers' purchase decision it is not the objective quality but the subjective and thus consumer-oriented quality which is of relevance. It can be seen as a psychological construct, based on consumers' perceptions (GREBITUS 2008; STEENKAMP 1990). The Total Food Quality Model by GRUNERT (1996) (compare figure 1) provides an overall framework for food quality analysis. It distinguishes between quality evaluation before- and after-purchase. Regarding the former, the model illustrates how quality expectations are formed based on quality cues and expected purchase motive fulfillments while concerning the latter it, in addition, includes experienced purchase motive fulfillment (GRUNERT 1996; GREBITUS 2008).

[Insert figure 1 here]

Quality expectations are based on the consumers' perception and assessment as well as on former experiences (GRUNERT 2005) and formed by the interaction of stored internal information and current external information provided during the decision making process e.g. at the point of sale. To perceive quality and form quality expectations consumers use pieces of information which are called quality cues. These cues enable consumers to judge products before consumption (STEENKAMP 1990). OLSON (1972) classifies cues as either extrinsic or intrinsic. Intrinsic quality cues refer to physical characteristics of the product, for example color or odor (GREBITUS 2009). Extrinsic cues are related to the product without being part of it, e.g. brand, price or label (VERBEKE and WARD 2006; GREBITUS 2009). COOL belongs into the latter group (OLSON 1972; SAMIEE 1994). With regard to food quality, which is often considered as uncertain by consumers, extrinsic quality cues play an important role (GRUNERT 1996; Grebitus 2009).

Even if consumers are not aware of the quality characteristics of a product coming from a specific origin they often have preferences for a region/country and transfer the related image to the product. This **affective component** is characterized by the fact that the country-image directly influences the image of the product. The dimensions of country-product associations are broad and range from the expectation e.g. "that the more natural a region is, the healthier products from that area are" (VAN ITTERSUM ET AL. 2003), or that consumers make the link

between specific products and countries such as wine and France or olive oil and Italy etc. (MORELLO 1993). This holds especially for consumers with a low product familiarity (e.g. CEMBALO ET AL. 2009). Country-images depend on political, socio-economic and cultural aspects. In addition, the country and product image depend on past experiences and emotions such as those experienced during holidays (GRUNERT 1996; BOTSCHEN and HEMETTSBERGER 1998; VAN ITTERSUM ET AL. 2001).

For analyzing product-country-image besides affective aspect cognitive and conative aspects need to be considered. The **cognitive** aspect includes the consumers' knowledge about the country (development, culture, religion) while the affective dimension comprises the mental attitude toward people or products from these countries. Finally, the **conative** component refers to the involvement and perceptual vigilance of the consumer with respect to the country/region (BAUGHN and YAPRAK 1993).

While the first purchase can only be based on informational cues repeated purchases are, in addition, influenced by former quality experience made by the household.

To conclude, studies indicate knowledge and image of a country have an effect on product evaluation and purchase decision of a COO labeled product (HESLOP and PAPADOPOULOS 1993; LEE and GANESH 1999). Nevertheless, the taste of a product is of crucial importance for its repeated purchase. Only if the experienced taste of a product of a specific origin convinced the consumer she will purchase the product again (BANOVIC ET AL. 2009). This study looks at the relevance of COO for consumers' choice considering affective, cognitive, conative and taste aspects. We test the hypothesis that organic consumers expect taste differences between peppers of different origins, are willing to pay a premium for pepper of their preferred COO and are able to taste pepper's aroma diversity because of COO.

### 3. Design of the study

The study (n = 100) was conducted over four days in an organic grocery store in Bonn, Germany in August 2009. Face to face interviews at the point-of-sale were carried out for understanding how consumers evaluate pepper in every day purchase decision. Figure 2 provides an overview of the structure of the survey which consisted of four parts.

The first part of the survey aims to analyze the relevance of different extrinsic quality cues. Consumers were asked to evaluate extrinsic cues like price, brand and COO labeling in everyday purchase decision in general using a 7 point Likert Scale (with (1) not at all important to (7) extremely important). The second part covered consumers' expected quality. Especially the link between COO and expected taste differences was taken into account by performing a word-association-test. This test helps identifying the product-country-image of pepper as well as consumers' knowledge regarding COO and pepper quality. Third, to analyze organic consumers WTP for pepper differentiated by origin and production method the contingent valuation method (CVM) is used. The fourth part of the study focuses on experienced quality. A blind-testing of black pepper from three different origins and two production methods (organic versus conventional) was conducted. After the blind tasting experiment the consumer was asked which of the pepper she would like to choose.

[Insert figure 2 here]

### 4. Sample characterization

As the survey was conducted in an organic grocery store the majority of the survey participants (88 %) are organic food shopper and buy at least once a week organic products. Most of the participants are women (66 %). According to research women are still the primary food shopper (CHILDS and PORYZEES 1997). Therefore the overrepresentation of women is not seen as a problem. Respondents with the age of 20 to 30 (25 %) and 45 to 55 years (25 %), as well as highly educated consumers (50 % holding a bachelor or master degree) with medium to high

income (more than 1100 €/month) are overrepresented in the study. 15 % are active in Non-Governmental Organizations and 11 % are engaged in environmental protection work. The respondents can be described as high involvement buyers purchasing their organic products in organic and conventional supermarkets. They less often use smaller organic-grocery stores and discount stores for buying food. The most mentioned reasons to purchase organic are health (25 %), better taste (21 %), naturalness (18 %), environmental protection and social aspects like the absence of child labor. 94 % of the respondents use black pepper (*piper nigrum*) at least once a week.<sup>1</sup> This is an indicator that respondents' involvement is high; results should benefit from this. Most of them (82 %) prefer the whole peppercorn and 57 % claim to favor organic pepper.

[Insert table 1 here]

## 5. Empirical results

### 5.1. Perceived extrinsic quality cue

Consumers were asked to evaluate the importance of 15 different extrinsic cues for their purchase decision on a seven point Likert scale with 1: extremely important to 7: not at all important. The results reveal that COO is e.g. more relevant than price, brand, advertisement and exclusivity but less important than production without child labor, quality, information, and ecological production (compare table 1).

### 5.2. Expected Quality

Studies confirming a positive effect of COO labeling on consumers WTP mostly use olive oil and wine (eg. SKURAS and VAKROU 2002; VERBEKE and WARD 2006; PETZOLDT ET AL. 2007). For these products advertisement focuses on and highlights COO (BECKER 2000). Besides those products, several brands also draw attention to COO for rice and tea. This, however, is so far not the case for pepper. Therefore we can assume that consumer's knowledge about and awareness of the producing country is more pronounced for wine, olive oil, rice and tea as for pepper. Furthermore we assume a higher involvement and product familiarity for the former compared to the latter. Accordingly, we investigate consumers **taste expectation** due to COO for olive oil, wine, rice and tea and for pepper. The results show that for olive oil 79%, for wine 81%, for rice 47 % and for tea 62 % of consumers expect taste differences due to COO while this holds only for 44% of the respondents in the case of pepper. Consumers were also asked whether they have a preference for a specific COO. In the case of wine 61 % of the survey participants indicate a preference for a specific country in their purchase decision. The preferred wine countries are Germany (34 %) and France (18 %). Also with respect to olive oil the majority of respondents (66 %) favor one country (52 % for Italy; 33 % for Greek). Similar results were derived for rice (33 % for India, 29 % for Thailand, 17 % for China) and tea (49 % India, 18 % for China and 15 % for Japan). In contrast only 16 % indicate a preference for a specific origin with respect to pepper of which India is most often mentioned (56 %), followed by China, however with a considerable smaller relevance (13 %). For all products analyzed, the correlation between expected taste differences due to COO and a preference for a COO is positive (above 0.5) and highly significant at the 0.01 level. This implies that preferred COO depend on expected taste. In comparison with the other products the chi-square value due to pepper is the highest (120). This implies that though only a minority of respondents' expects taste differences due to COO in the case of pepper this expectation is based on preferences for a specific country. Overall, the results indicate that taste and COO correlate depending on product familiarity and involvement. In the case of pepper the majority does not expect taste varieties. This is not astonishing as only organic brands label peppers producing country.

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<sup>1</sup> Black pepper has a similar importance like salt, which is used by 91 % of the respondents every day.

Moreover in contrast to e.g. wine and olive oil advertisement for spices focusing on COO is in general rare.

Thus, it is no surprise that **consumers' knowledge** about the diversity of pepper due to COO is relative low. Though 56 % of the consumers state to know where pepper was first grown, only 47 % of those name India and thus just about every fourth respondent knew the correct heritage. Besides India, consumers assume that pepper was first grown in Madagascar (22 %), Indonesia (12 %), Sri Lanka and South America. Also being asked whether they expect taste differences between organic pepper originating from India and Indonesia 78% of the survey participants stated that they do not know. As has been discussed above, COO can serve as quality indicator. The precondition is, however, that marketers are able to create knowledge regarding the taste differences of pepper dependent on COO. So far this seems to be not the case.

The relevance of COO in the case of pepper in comparison with other product attributes such as price was tested by means of a **word-association-test**. Consumers were asked to write down what they associate with pepper. The results reveal that though COO was mentioned 17 times by the respondents it is only one of many relevant product attributes consumers associate with pepper. Most frequently associated with pepper are varietal diversity (64 times) and spiciness (54 times). Thus, based on the word association test we can conclude that differences between pepper varieties are rather made based on the degree of maturity (e.g. black pepper versus green pepper) than on COO.

### 5.3. Experienced Quality and Future Purchase

The blind tasting experiment aims to analyze whether not only experts but consumers at large are able to perceive taste differences between pepper of different origins and production methods and to compare aroma, pungency and finish of five black pepper on a scale from 1 to 4 with 4 = very aromatic/very high pungency/very strong finish and 1 = hardly any aroma/pungency/finish. In the blind testing pepper of three different regions (India, Sri Lanka, Vietnam) and two different production methods (organically versus conventionally produced) was considered (see table 2). Three of the four organic peppers are exclusively distributed in organic stores. One organic and one conventional pepper are available in the conventional retail sector.

The rank variance analysis is used to compare the aroma, pungency and finish respondents assessed. It delivers the middle-ranking for each pepper and the chi-square value. The results are significant with p-value below 0.00 for all tested pepper characteristics (compare table 2). Our findings show that pepper of Wagner, who belongs to the biggest conventional spice brand in Germany, receives the highest numbers regarding pungency and finish and the second highest with respect to aroma. The pepper from Herbaria is considered by the participants as the most aromatic one while the conventional pepper from Fuchs is evaluated as the least aromatic pepper. Directly asked after tasting which pepper they would like to purchase (neither price nor brand was known to the participants) 31 % of the respondents chose Herbaria pepper and thus the brand which was evaluated as the most aromatic pepper but with low pungency and only mild finish. However, also 12 % of the respondents decided to purchase Fuchs pepper and thus the one which was considered as least aromatic. The choice of another 27 % of the taster goes to Wagner pepper, followed by Heuschrecke (16 %) and 14 % of consumers which prefer Sonnentor. These results do not give a clear picture which of the three dimensions aroma, pungency and finish is important for the final purchase decision. A cross table analysis provides deeper insides. It reveals that a large share (72%) of those respondents who indicate that they would like to purchase the Herbaria pepper describe the pepper as very aromatic or as aromatic (3 and 4 on the above mentioned scale) while this does not hold for those who are not interested in buying this pepper. The p-value of the chi-square is with 0.01 highly significant.

In contrast, 'pungency' and 'finish' do not significantly influence the choice of Herbaria pepper. Similar results are obtained for the other peppers. This indicates that 'aroma' is the most important aspect of taste and thus the one which primarily influences the purchase decision. To summarize, the findings of the blind tasting shows that consumers are able to taste and evaluate flavor varieties with respect to pepper. The results lead furthermore to the conclusion that consumers purchase decision for pepper is mainly based on aroma experience and less on pungency and finish.

[Insert table 2 here]

#### **5.4. Perceived costs and cost cues**

One aim of the study is to assess whether consumers have a preference for COO labeling in the case of pepper and whether this kind of labeling can be a successful means of product differentiation. To answer this question consumers' willingness to pay (WTP) is investigated by means of the dichotomous CVM. In the contingent valuation method consumers' valuation of goods is estimated by creating a hypothetical market situation (CARSON 2005).

In our survey, we provide consumers with information on the price of conventional pepper and first ask them about their willingness to accept a certain price for a pepper that is differentiated by COO (Indonesia, India) and/or production method (conventional, organic, Fair trade); e.g. are you willing to pay 4.58 € for pepper from India In total the WTP for six different peppers<sup>2</sup> is investigated. As our analysis is based on the dichotomous CVM, we ask a second choice question depending on the response to the first one (double-bounded). Thus, if consumers are ready to accept the first price we confront them with a second, an even higher price, and ask them if they are willing to pay this price as well (e.g. are you willing to pay 5.58 € for pepper from India) (HANEMANN ET AL. 1991). If the survey participants already refuse to pay the first price no second question is posed. In addition, all respondents were asked for the hypothetical maximum price they would be willing to pay. Previous research shows that without any anchor respondents find it hard to determine the highest price they are willing to pay and many zero responses result (CARSON and MITCHELL 1993). Therefore we combine the dichotomous choice question with an open-ended question. We are aware that the anchor price might influence consumers stated WTP.

About 60 % of the respondents are not willing to pay anything for conventional black pepper. As the survey is carried out in an organic grocery store most respondents have a high preference for organic products and thus are not willing to pay anything for conventionally grown spices. The WTP for pepper from India is slightly higher than the one originating from Indonesia. This holds for conventional and for organic pepper, however, the difference for the latter is rather small. The WTP for organic pepper with a COOL (India, Indonesia) is higher (mean: 4.64 and 4.71, respectively) than for organic pepper without any COO information (4.24). The consumers, however, pay only a relatively low premium (10%) for the COO information. A considerable higher WTP (mean 6.35) can be observed with regard to organic COOL Fair Trade pepper. Almost 10 % of the respondents are willing to pay 10 € to even 15 € for organic COOL Fair Trade pepper.

#### **6. Conclusion and discussion**

The special feature of our empirical study is the combination of face-to-face interviews regarding attitudes, image and knowledge with a blind tasting of pepper and an investigation of consumer's WTP for pepper from different origins and processing characteristics.

COO is used for several food products such as wine, coffee and olive oil for product differentiation. According to experts also pepper should be differentiated with respect to

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<sup>2</sup> Consumers are asked for their WTP for COOL conventional pepper (from India and from Indonesia), organic pepper, organic COOL pepper (from India and from Indonesia) and finally for organic COOL Fair Trade pepper.



country and region of origin as aroma, pungency and finish of pepper varies depending on the COO and region of origin. A market analysis carried out in the framework of this study reveals that so far only organic brands label COO, and even in this segment it is a rarely used quality cue. Our analysis reveals that at present market success of organic brands seems primarily to rely on price and the ability of firms to reach a high distribution level for their brands.

Research revealed that knowledge is a crucial factor for the use of COO labels as purchase criterion (e.g. SCHÄFER 1997; VAN ITTERSUM ET AL. 2001). Thus, only for those consumers who know about a products' diversity, e.g. taste variety as a result of its COO it can influence the purchase decision. Based on a consumer survey we can show that COO in the context of other product attributes is of medium importance for consumers' general purchase decision. Our results also indicate that the majority of consumers expect taste differences due to COO for products such as olive oil, wine, rice and tea and have a preference for one specific country. In the case of pepper, the share of consumers that expect taste differences due to COO is with 44% lower. Even much smaller is the share of consumers who indicate a preference for one specific country due to the assumed taste differences. As our statistical analysis shows that for all analyzed products preference for a specific COO depend on expected taste difference, the lower knowledge regarding COO in the case of pepper hinders product differentiation based on COO for this product. The little awareness of consumers regarding quality differences due to COO in the case of pepper was also revealed by other survey elements such as a word association tests regarding pepper. This can explain that the difference between the maximum stated WTP we obtained for pepper with COO information, e.g. India is small compared to pepper differentiated by other characteristics such as organic production or Fair Trade. A significant higher WTP is only observed in the case of organic COOL Fair Trade pepper. In this case the respondents theoretically accept a higher price, but we suspect a social desirable responding. To avoid the problem of social desirable answers a decision lab design could be adopted and the hypothetical market situation could be improved through a real market situation, where the consumer has to buy the product he has chosen.

Based on a blind tasting experiment, we were, however, able to show that consumers can taste differences in aroma, pungency and finish between various peppers differentiated by production method and origin with aroma being the product characteristic mostly influencing their preference for one product.

Thus, COO potentially can serve as quality indicator in the case of pepper. The precondition is, however, that marketers are able to create knowledge regarding the taste differences, especially aroma, of pepper subject to COO. So far this seems to be not the case. Providing consumers with COO information that links COO to a specific (aroma) taste could increase consumers' respective knowledge, thereby making COO to a relevant characteristic in consumers' purchase decision of pepper. As our study was conducted in an organic grocery store our sample is not representative for the German population. It can, however, be assumed that knowledge on and relevance of COO is even considerable lower for 'conventional' food shopper as they can be considered less involved. Thus, it might seem reasonable to focus marketing activities first on the organic consumer segment.

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Figure 1: Total Food Quality Model by Grunert 1996

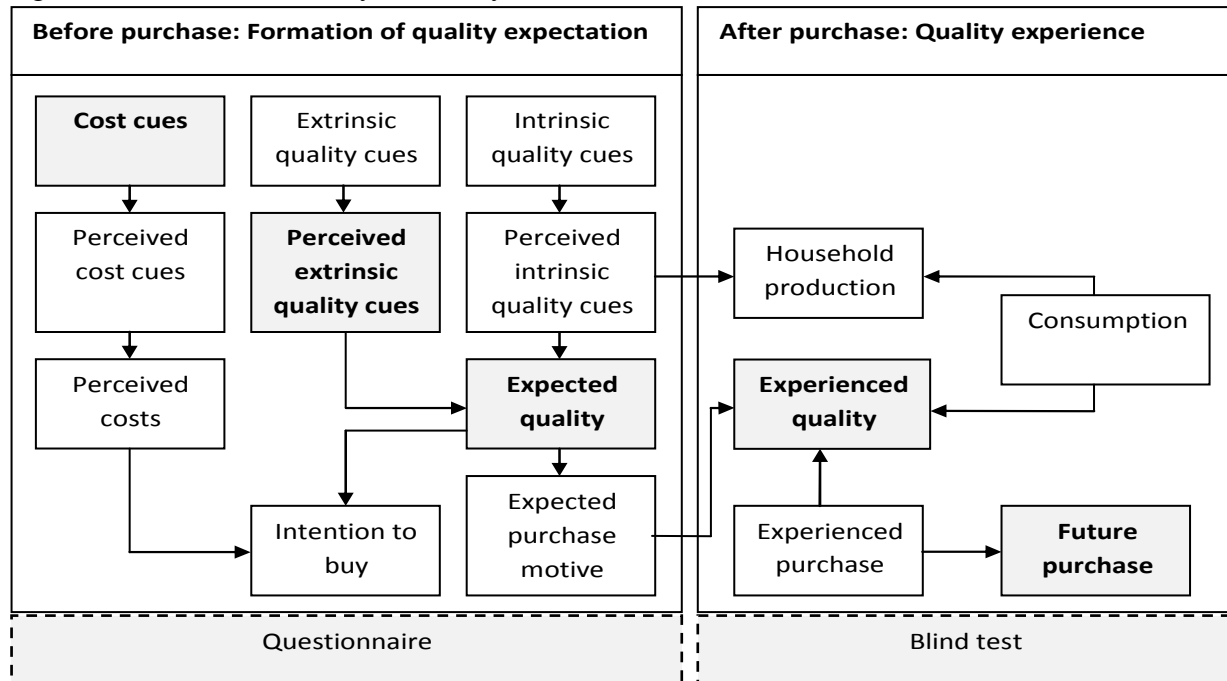


Figure 2: Overview of the structure of the survey

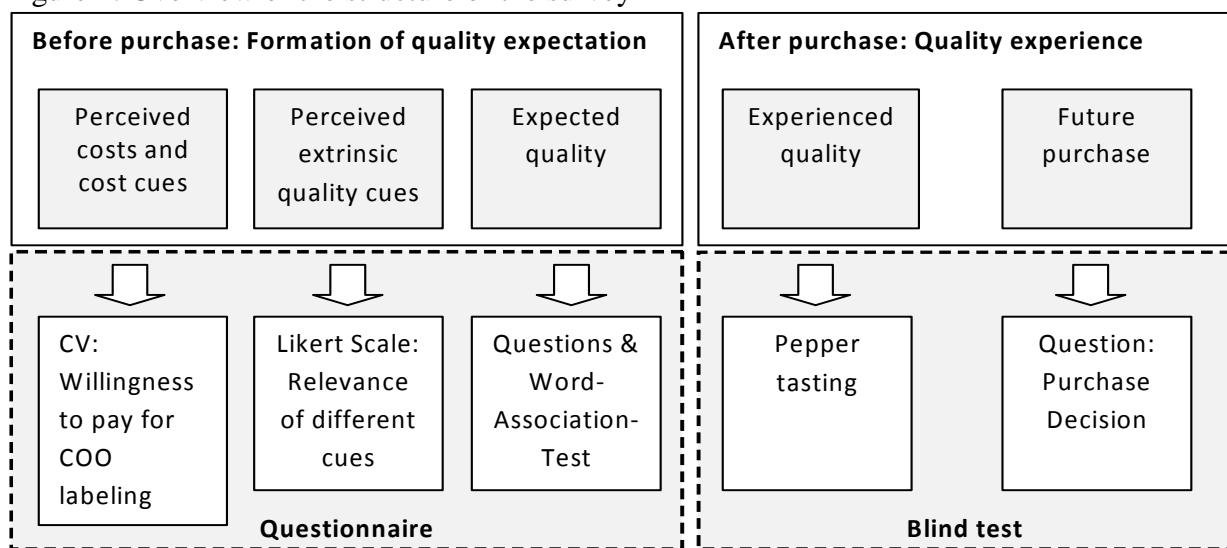


Table 1: Description of Variables

Variable	Variable Description	n	Mean	Std.Dev.
<b>Importance of different Items in everyday purchase decision</b>				
No Child Labour		99	6.60	.94
High Quality		100	6.59	.61
Price Fits Quality		98	6.48	.78
Product Information		99	6.31	.91
Sustainable	Attitude measured	100	6.07	1.10
Fair Trade	on scale from not at all	96	6.05	1.28
Certified Origin	important (1) to extremely	100	5.93	1.30
Ecofriendly Package	important (7)	99	5.78	1.45
Convenient Package		100	5.34	1.40
Special Offer		100	5.29	1.34

Variable	Variable Description	n	Mean	Std.Dev.
Cheap Product		99	4.79	1.31
Country Preference		92	4.59	2.09
Aesthetic Package		99	4.44	1.69
Brand		100	3.21	1.87
Exclusiveness		99	3.19	1.83
<b>Purchase behavior</b>				
Organic grocery store		99	1.82	1.03
Organic supermarket	How often do you buy organic	100	3.84	1.72
Grocery store	food in the respective store? <sup>c</sup>	100	2.86	1.59
Discount store		100	3.01	1.75
Taste		100	0.57	0.50
Healthy	Why do you buy organic food?	100	0.66	0.48
Naturalness		100	0.48	0.50
Gourmet	Attitude measured on scale	100	0.08	0.27
Product Information	from not at all important (1) to	100	0.07	0.26
Sustainability	extremely important (7)	100	0.44	0.50
Social Aspects		100	0.37	0.49
<b>Socioeconomic characteristics</b>				
Gender	0 = female; 1 = male	100	0.34	0.48
Age	Age in years <sup>b</sup>	100	1.97	0.85
Income	Household-Net-Income [€] <sup>c</sup>	82	1.92	0.63
Education	Education Level <sup>d</sup>	100	2.33	0.75
Children < 18 <sup>b</sup>	Number of children < 18 years	100	0.23	0.68
HHsize	Household size	99	1.82	1.03
<b>Social activities <sup>b</sup></b>				
NGO	Member or engaged in	100	0.22	0.42
Environmental protection	Member or engaged in	100	0.16	0.37

<sup>a</sup>: Dummy Variable equal to 1 if yes, 0 otherwise

<sup>b</sup>: Categorical variable: 1 = < 20-35; 2 = 35-50; 3 = 50+

<sup>c</sup>: Categorical variable: 1 = < 300-1.100; 2 = 1.100-3.600; 3 = > 3.600

<sup>d</sup>: Categorical variable: 1 = primary school level; 2 = secondary school level; 3 = university degree

Table 2: Blind testing of pepper: mean and middle ranking value

Brand	Herbaria		Heuschrecke		Sonnentor		Wagner		Fuchs	
	Mean (std.)	Middle Ranking Value	Mean (std.)	Middle Ranking Value	Mean (std.)	Middle Ranking Value	Mean (std.)	Middle Ranking Value	Mean (std.)	Middle Ranking Value
Aroma	2.57* (1.04)	3.37	2.14 (0.94)	2.86	2.12 (0.93)	2.85	2.45** (0.1)	3.30	2.07 (1.0)	2.63
Pungency	1.87 (0.84)	2.7	2.05 (0.9)	3.00	2.10** (0.87)	3.08	2.33* (0.92)	3.45	1.96 (0.91)	2.77
Finish	2.09 (0.83)	2.57	2.41 (1.02)	3.05	2.45** (0.9)	3.11	2.62* (1.1)	3.39	2.33 (0.94)	2.88

Own calculations: n = 97; Chi<sup>2</sup> = 19.186; df: 4; p = 0.001. 4 point scale from 4 = very aromatic/very high pungency/very strong finish to 1 = hardly any aroma/pungency/finish.

\* Best product in the blind test regarding taste characteristic

\*\* Second best product in the blind test regarding taste characteristic