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Consumer Expectations Regarding Sustainable Food: Insights from Developed and Emerging Markets

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Abstract

This study advances marketers' knowledge about consumer expectations regarding sustainable food in both industrialized (Germany, United States, Switzerland) and emerging economies (Brazil, China, India). Data was obtained through an online consumer survey of 1,179 respondents. Findings show that consumer expectations regarding sustainable food consist of five factors: ethic attributes, naturalness, health-related aspects, terroir, and innovation.

International agri-business marketers can use the outcomes of this study to design well-tailored communication strategies promoting sustainable food. Scholars can build upon the resulting multi-country sustainability scale to reach a less western-biased understanding of consumer expectations of sustainable food in emerging economies.

Keywords: sustainable food; consumer expectations; international marketing; multi-group comparison; invariance analysis

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Introduction

The sustainability of food production and consumption is an issue of growing importance. Many conventional methods of food production and consumption are contributing to the environmental, ethical, and social problems seen around the world (Garnett 2013; Reisch et al. 2013; Verain et al. 2015). This is especially a concern for the agri-food sector and consequently attempts are being made to improve the environmental and/or ethical/social situation along the food supply chain through certification, labelling, and other differentiating strategies which is creating specific markets under the notion of sustainability (Abeliotis et al. 2010; Aikin 2011 and 2014; De Haen and Requillart 2014; Verain et al. 2012).

Because there is no binding definition for the term "sustainable food", the perception of what constitutes sustainable food is thus open to a large variety of interpretations influenced by a multitude of different factors such as culture, values, motives, and the economic or environmental situations (De Carvalho et al. 2015; Grunert et al. 2014; Sautron et al. 2015).

On one hand, there is not a comprehensive scheme for sustainable food—on the other, food labels focusing on single (e.g., environmental or ethical) sustainability attributes are proliferating the marketplace showing the contemporary relevance of sustainability differentiation in the global food sector (Codron et al. 2005, Franz et al. 2010; Grolleau and Caswell 2006, Jahn et al. 2005).

Consequently, adequate and effective communication and differentiation strategies for food products regarding their sustainable contributions become crucial.

This exploratory study, therefore, aims at giving international agri-food market actors better insights into what consumers in industrialized and emerging economies expect from sustainable food. The study uses a unique dataset collected in 2013 from an online consumer survey (N=1,179) in three industrialized (Germany, Switzerland, the United States) and three emerging countries (Brazil, China, India).

Sustainable Food Consumption

Sustainability is increasingly recognized as a major issue for most economies, but especially in the agri-food sector, it has become an important differentiation and communication topic (Codron et al. 2005; Grunert 2011; Reisch et al. 2013, Verain et al. 2012, Vermeier and Verbeke 2006). There is a great number of attributes that enable product differentiation with regard to sustainable food, and that can help agri-food businesses increase the value of commodities (Codron et al. 2005, Dosi and Moretto 2001; McEachern and McClean 2002). Moreover, demonstrated environmental, social and/or ethical responsibility can actively foster a positive corporate image (Carlson et al. 1996; Morris et al. 1995).

Presently, there is, however, no exact shared definition of sustainability. Equally, there is no standard approach for the concept of sustainable food (Johnston et al. 2007; Reisch 2011). Looking at food production, there are, however, already quite a few products that are marketed as more sustainable than others due to their specific attributes such as environmental or ethical aspects. As these are credence attributes, they have to be certified and labeled to enable

consumers to identify them (Caswell and Padberg 1992; Jahn et al. 2005). Until today there is no general sustainable food label available, but certification schemes that focus on environmental, social and/or ethical aspects of food production like eco, organic or fair trade. These market niches are vividly growing over the years (Fair Trade 2013; Sahota 2013). Consumers tend to associate this kind of more sustainable food products with health benefits, environmental benefits or increased fairness towards food producers (von Meyer-Höfer et al. 2015). As concerns about this kind of consumption issues rise globally, products with respective attributes are increasingly in demand (BBMG, GlobeScan and SustainAbility 2012; National Geographic and GlobeScan 2012; SustainAbility and GlobeScan 2012).

Globalization facilitates and accelerates the exchange of information, goods and people across national boundaries and leads to the emergence of increasingly global consumer markets. Thus, besides commonly known global segments for luxury goods, fashion and music there are also global segments for sustainability concerned consumers especially among the growing well-educated middle classes (Craig and Douglas 2006; Court and Narasimahan 2010; Douglas and Craig 2011; Miller 1998; Shermach 1995).

Although sustainable food consumption is gaining importance around the world (Nash 2009), research on the subject is still quite fragmented (Grunert et al. 2014). Most studies analyze single aspects of sustainable food consumption and often concentrate on environmental sustainability. With regard to environment-friendly consumption as well as to the consumption of organically grown food products a well-established body of literature on sustainability exists (Aertsens et al. 2009; Honkanen et al. 2006; Loureiro et al. 2001; Roberts 1996). This is true, despite the criticism of conventionalization raised by a growing number of scholars against the organic sector (for an overview of the conventionalization debate see Best 2008). Fewer studies look at ethical aspects of consumption such as fair trade (Adams and Raisborough 2010; McCluskey et al. 2009) or animal welfare (Honkanen and Olsen 2009; Lagerkvist and Hess 2011). In this context, the analyses of Sautron et al. (2015) and de Cavalho et al. (2015) are among the few studies that include a concern for sustainability as a stand-alone concept. For instance, whilst Sautron et al. (2015) include sustainability concerns among several food choice motives, de Cavalho et al. (2015) focus their work on sustainability consciousness in food consumption and propose to treat sustainability as a five-dimension construct. All in all, most of the revised studies are conducted only in single countries or on single continents with a strong emphasis on industrialized countries (Grunert et al. 2014). This leads to problems in the comparability of studies and their generalizability

Against this background, the major contribution of this study is to provide a scientific basis for advancing agri-food business managers' knowledge concerning consumers' expectations regarding sustainable food as such not only for a specific product in both industrialized and emerging economies. To this end, the study design consists of three industrialized (the United States, Germany, and Switzerland) and three emerging countries (China, India, and Brazil).

The decision to also include emerging economies is due to the fact that although scarce, the literature on sustainable food consumption in emerging countries gives insights into a steady increase in production and consumption of sustainable food products there. It seems that this trend is particularly strong in the urban centers of Latin American (Brazil) and Asian (China or

India) countries (Eguillor Recabarren 2009; Flores 2013; Garibay and Ugas 2009; Kung Wai 2013; FLO Fairtrade International 2013; von Meyer-Höfer and Spiller 2013).

However, it seems that consumers' associations with sustainability and their expectations towards sustainable food differ between emerging economies and industrialized countries due to the different cultures and stages of economic development.

This requires an improved understanding of the differences in consumers' expectations. To our best knowledge, no study has so far analyzed consumer expectations towards sustainable food as such simultaneously in several emerging and industrialized countries.

Sustainability Attributes and Tested Items

For the communication of sustainable food, it is important to get to know consumers' expectations regarding sustainable food on a broad and global scale. Which attributes have to be communicated when offering sustainable food products? Do consumers from developed and emerging countries have the same expectations regarding sustainable food? These are the overarching research questions to be addressed in the present study. This is why this study does not focus on a specific product or single country but on food products in general and in several countries with different cultures as well as economic, social and environmental situations.

Table 1 shows the items that have been chosen to be tested in this study after an extensive literature review during the year 2012. At that time there was no commonly agreed definition of sustainable food available, but many different approaches (e.g., Sustainable Development Commission 2005; Reisch 2011; Reisch et al. 2013). Additionally, there were international certification schemes and labels for food marketed as more sustainable like eco, organic, fair trade or animal welfare labels. Putting the different available sustainability attributes and standards together sustainable food should at least comply with the following criteria: respect for biophysical and environmental limits in both production and processing, observable high standards of animal health and welfare, affordability of food for all, support for rural economies and the diversity of rural culture, viable livelihood for farmers, a safe and hygienic work environment for farmers and employees whether nationally or abroad. Moreover, as sustainable food is marketed mostly in premium niche markets, it is clear that it complies with the usual quality criteria for food such as safety, health, taste, freshness, etc. Keeping in mind that the different aspects of sustainable food were tested in a consumer study the list includes the most comprehensive items which were pre-tested in each country.

To provide a comprehensive presentation of the tested items, they are divided into sub-groups including environmental and ethical sustainability attributes, health aspects, traditional food attributes and terroir. The division of the twenty-four tested variables shown in Table 1 is by no means exclusive, but an attempt to make the huge variety of attributes more comprehensible. "no genetically modified organisms (GMO)", for example, is certainly an attribute used to differentiate sustainable food from conventional food, whether it is motivated from an environmental perspective or from a health perspective.

Table 1. Sustainability items grouped according to differentiating aspects

Sub-groups	Tested Items
Environmental attributes	Environmentally friendly production Environmentally friendly packaging Reducing greenhouse gas (GHG) emissions Free from synthetic fertilizer Free from chemical pesticides
Ethical attributes	Ensuring high animal welfare Ensuring fair prices for producers Ensuring good working and living conditions for food producers Produced without child labor
Health aspects	Health benefits Free from genetically modified organisms (GMO) Natural Safe No artificial additives
Traditional food quality attributes	Good taste Fresh High nutritional value Following current trends Innovative Convenient
Terroir	Seasonal production Local production Traditional

Source. Author's own compilation 2015

The sub-group of environmentally friendly attributes includes most of the basic criteria required for organic products. They represent the worldwide best known alternative food products which aim at sustaining the environment and natural resources. Among the organic production criteria, as for example defined in EU regulation 834/2007 for organic regulation, are no use of chemical pesticides, no use of synthetic fertilizers, no use of GMO and high animal welfare. Moreover, more general aspects of environmentally friendly food production are also included in this list like, e.g., environmentally friendly packaging, which is required by a number of eco-labels (e.g., EU-Eco-Label) and climate saving aspects such as reducing greenhouse gas emissions.

The group of ethical attributes summarizes fairness aspects such as those required for fair trade certification programs like good working and living conditions, fair prices for producers, and no child labor, but it also contains ethical aspects such as animal welfare.

The group of health aspects summarizes the items healthy, no use of GMO, naturalness, no artificial additives as well as safety, which play an important role in the sustainability of food consumption (Reisch et al. 2013; Sautron et al. 2015).

The category of traditional quality criteria comprises the most common food differentiation aspects, such as taste, freshness, nutritional value (high), the level of innovation and convenience (Sautron et al. 2015). These attributes traditionally influence the strategic positioning of food and can be easily identified by the consumer (Antle 2001; Darby and Karni 1973; Nelson 1970). Price is, in general, one of the most important food choice motives (Blaylock et al. 1999; Eertmans et al. 2005; Lindeman and Vaananen 2000; Steptoe et al. 1995). It has thus also an important (most often negative) impact on sustainable food consumption, because of the higher prices of sustainable food compared to conventional alternatives (Grunert et al. 2014).

Terroir is a category that emerges in several studies concerning sustainable food and relates to the cultural and geographical factors that characterize foods and agricultural products. The linkage between terroir and sustainability seems to be a prerequisite for the successful formation of territorialized food clusters (Sidali and Hemmerling 2014; Lee and Wall 2012). It contains the items "seasonal production", "local production" and "tradition".

Six countries, three industrialized and three emerging, were selected for data collection. Among the industrialized countries of the world, the United States of America, Germany and Switzerland were chosen. They represent leading markets for sustainable food products, in terms of production and consumption of for instance organic food (Sahota 2013) or fair trade products (Fair Trade 2013). They also belong to the two continents that are among the economically most developed in the world. The chosen emerging countries belong to the so-called BRIC-nations (Brazil, Russia, India, China), which represent the location of the majority of the global population, land area and economic growth (O'Neill 2001). By the selection of the countries, a variation of different cultural, economic, social and environmental situations is represented in the sample.

Data Collection

Data for this exploratory study were collected by an online consumer survey conducted during July and August 2013 in three industrialized (Germany, the United States of America, Switzerland) and three emerging countries (Brazil, China, India). The total number of respondents is 1,719 (N: GE= 288 CH=282; USA=290; BR=285; CN=295; IN=279). A private marketing research panel provider recruited the participants. Only consumers who stated to be responsible for the majority of food shopping in their household took part in the survey.

The question asked to the respondent was: Which characteristics should a sustainable food product have? The 24 items displayed in Table 1 were then shown to the respondents in randomized order. The answer options ranged on a seven-point Likert scale (1 = strongly disagree; 2 = disagree; 3 = somewhat disagree; 4 = neither agree nor disagree; 5 = somewhat agree 6 = agree; 7 = strongly agree).

The questionnaire was originally designed in English. To ensure the quality of the translation, native speakers performed a back-translation, before the questionnaires were pre-tested in each country. In the USA and India, the survey was done in English. In Germany and Switzerland a

German version was used; additionally, French-speaking Swiss could choose a French version. In Brazil, the questionnaire was Portuguese and in China Mandarin.

Regarding the panel survey, the panel providers sent the survey link to the panel participants, allowing them to respond to the questionnaire at any time with Internet access. The statements of the respondents were saved online and converted into SPSS files for the analysis. The average time spent answering the questionnaire was between fourteen minutes in the USA and twenty in India.

The main reason for conducting an online survey was that this method means that data collection is not regionally restricted based on the mobility of the interviewer. Further advantages are lower costs and quicker response times compared to other survey methods (Weber and Bradley 2006). In industrialized countries, online consumer surveys have become quite common in marketing research, but also in emerging and developing countries more and more online surveys are conducted with the help of private marketing research panel providers.

Table 2 gives an overview of the gender distribution and education level of the samples from analyzed countries. Surprisingly, the samples found a majority of responders to be men in some countries, which might be due to the fact that single men are more often registered in private marketing panels than women in these countries.

Table 2. Sample characteristics

	CH-F	CH-GER	GER	USA	BR	CN	IN
N	130	152	288	290	285	295	279
Female (%)	48.5	47.4	56.6	68.3	44.9	41.4	29.0
Male (%)	51.5	52.6	43.4	31.7	55.1	58.6	71.0
University degree completed (%)	25.4	16.4	22.2	43.8	47.7	88.8	90.0

CH-F= French-speaking Switzerland, CH-G= German-speaking Switzerland, GER= Germany, USA= United States of America; BR= Brazil; CN= China; IN= India
Source. Own data 2013

The total sample of 1,179 respondents (around 300 per country) is not representative enough to make general conclusions because the sample is biased towards higher educated participants with higher incomes from urban centers compared to the averages of the analyzed countries. However, it is known that, socio-demographic characteristics often have only mixed effects on the consumption of sustainable food in industrialized countries (Dagevos 2005; Diamantopoulos et al. 2003; Dickson 2001; Doran 2009; Gil et al. 2000; Jain and Kaur 2006; Loureiro and Lotade 2005; Verain et al. 2012). In the context of emerging and developing countries, studies show that richer and better-educated consumers often have a significantly higher willingness to pay for food safety and quality which is often associated with sustainability aspects (Gonzalez et al. 2009; Krishna and Qaim 2008; Liu et al. 2009; Mergenthaler et al. 2009; Padilla-Bravo et al. 2007; von Meyer-Höfer et al. 2015). Hence, it is likely that the biased samples may still represent the potential target groups for sustainable food quite well. Following this line of argumentation and as displayed by the invariance analyses in the remainder of this article, the six

samples are comparable among each other. However, the implications and conclusions of this explorative should be interpreted in the light of the biases.

Data Analysis

As mentioned before, the aim of this study is to analyze whether consumers' expectations regarding sustainable food differ among industrialized and emerging economies . This raises the necessity to assess the cross-cultural comparability of the tested items (Brunsø et al. 1996) in order to establish to what extent the tested sustainability attributes are equally understood across the six different countries. These differ in their levels of economic development, environmental and social situation, culture and language. Thus, as stated by Davidov et al. (2008), if groups are not equivalent, like in the absence of invariance, interpretations of between-group comparisons are problematic because it could lead to erroneous conclusions (Davidov and De Beuckelaer 2010).

In their seminal article, Steenkamp and Baumgartner (1998) address the importance of establishing a method to compare groups by identifying three levels of equivalence, e.g., configural, metric and scalar invariance.

Configural equivalence is the weakest form of comparability and it means that "the matrix of loadings in two samples has the same pattern, e.g., the same non-zero elements" (Brunsø et al. 1996, 25). Furthermore, Davidov et al. (2008) point out that configural invariance is supported if a multiple-group model fits the data well, all item loadings are significant, and the correlations between the factors are less than one in all groups. The assessment of configural equivalence is a pre-requisite for the further analysis of metric invariance.

The latter is established whenever individual surveys have identical factor loadings across groups (Davidov and De Beuckelaer 2010). Since cross-cultural research is based on different sets of cognitive categories, which are translated from one culture to another (Brunsø et al. 1996), survey instruments should display metric equivalence across groups (Davidov and De Beuckelaer 2010). The assessment of metric equivalence reveals that individuals who belong to different cultural and/or linguistic groups perceive survey items in the same way. As stated by Davidov and De Beuckelaer (2010) metric equivalence is supported "if the model fits the data well and does not result in a significant reduction of fit when compared with a model that does not set any measurement parameters to be equivalent across groups" (Davidov and De Beuckelaer 2010, 5).

Whenever intercepts of like items regressions on the latent variables are equal across groups, scalar invariance can be established (Davidov et al. 2008). Scalar invariance is also referred to as "strong cultural identity because the only way in which the samples can differ is in the level of endorsement of the various items, while everything else – their complete meaning structure, including item reliability – is the same" (Brunsø et al. 1996, 26). After having compared the findings of different scholars, Davidov and De Beuckelaer (2010) found out that full scalar invariance is almost never supported. Hence, they suggest testing for partial equivalence across those groups that are culturally or linguistically similar. Since multiple group confirmatory factor analysis (MGCFA) is a well-established technique to measure invariance (Jöreskog 1971), in the

following, we present the results of several confirmatory factor analyses (CFAs) that have been conducted both for single countries as well as at aggregate levels.

Results

Before testing for different levels of invariance, several exploratory factor analyses (EFA) were calculated (data are anytime available upon request to the authors). Based upon these, the confirmatory factor analysis (CFA) model for each of the six countries was estimated as suggested by different authors (e.g., Byrne 2013; Davidov and De Beuckelaer 2010). This model contains five latent variables: Ethical attributes (F1); Naturalness (F2); Health-related attributes (F3); Terroir (F4) and Innovation (F5). In total, six variance-covariance matrices were used as inputs for the models. All models were estimated using AMOS 21.0 software program and the maximum likelihood (ML).

Results of the CFAs in each country employing second-generation tests (Homburg and Giering 1996) showed that it was not possible to identify all of the items tested in the previous exploratory factor analyses. Five items were problematic in almost all countries thus displaying item reliability value less than 0.4. This led to the deletion of three items: no child labor; traditional; natural; cheap and convenient. After this step, the model was run again at single country level. All models displayed satisfactory RMSEA but CFI-values below 0.90. Since model fit criteria do not provide an adequate indication of the size of the misspecification in the model the modification indices as suggested by Saris, Satorra and van der Veld (1987) were applied. The observation of these values in combination with the expected parameter change pointed to a substantial model misspecification, namely a large error covariance between the item fair payment for producers and the item fair working and living conditions for producers. Clearly, these two statements are related to fair treatment of producers both from a financial and from an ethical point of view. Given this overlapping, an error covariance between the two items was added. Next, the model was run again reaching satisfactory model fit values (see also Appendix).

Then the configural, metric and scalar equivalence were calculated. Table 3 presents the fit indices of the different equivalence models. Model 1 is the basic configural invariant model with six countries. The indices reveal a good fit to the data (CFI = .929, RMSEA = .029, P close = 1.000; AIC = 2804.810; BCC = 2877.761, Chi-square = 2038.810, degrees of freedom = 871), which means that configural invariance is supported in this model, and that the model pattern can be considered equivalent across the six countries.

Next, metric invariance was checked. As mentioned above, this test answers the question to what extent the tested items are related to the items across countries. As stated by Davidov (2008), this is a necessary condition to guarantee that people understand the questions equally across the six groups of countries. To test for metric invariance the same configural invariance model was used as a departing point, and a fully invariant model where all loadings were fixed equal across the groups of countries was built (Model 2) (Davidov et al. 2008). The indices reveal a good fit to the data (CFI = .918, RMSEA = .031, P close = 1.000; AIC = 2927.100; BCC = 2986.718, Chi-square = 2301.100, degrees of freedom = 941), which means that metric invariance is supported as well.

Finally, scalar invariance was tested. This allows for the comparison of factor means in addition to the factor loadings between the items and the factors. To test scalar invariance, the intercepts of the items should be a constraint to be equal across the six countries. The fit indices are presented in Model 3 in Table 3 and suggest that this model does not hold a good fit. In fact, only P close (= 1.000) and RMSEA (= .039) are indicative of a good fit.

As already shown, whilst factor items are comparable across all six countries, factor means are only comparable between the USA, Germany, and Switzerland. In the next and final step measurement error variances were calculated. Normally these parameters are rarely constrained equally across groups as this "is considered to be an excessively stringent test of multigroup invariance" (Byrne 2013, p. 220). However, this parameterization is considered important to test for the equality of reliability related to the assessment of scales (Byrne 2013). The last row of Table 3 shows that when constrained to be equals, measurement error variances display satisfactory fit indices (CFI = .926, RMSEA = .042, P-CLOSE = 1.000, AIC = 1368.173, BCC = 1397.165, Chi Square = 1116.173, DF = 501), which can lead to the validation of the tested sustainability scale across the USA, Germany and Switzerland.

Table 3. Fit measures of a multi-group confirmatory factor analysis

	CFI	RMSEA	PCLOSE	AIC	BCC	Chi-Square	df
Models							
1 Configural invariance	.929	.029	1.000	2804.810	2877.761	2038.810	871
2 Metric invariance	.918	.031	1.000	2927.100	2986.718	2301.100	941
3 Scalar invariance	.852	.039	1.000	3925.982	3967.506	3489.982	1036
4.1 Partial scalar invariance (Germany, Switzerland, USA)	.916	.045	.996	1446.558	1476.011	1190.558	499
4.2 Partial scalar invariance (Brazil, China, India)	.893	.047	.954	1526.377	1543.938	1280.377	444
Item Reliability							
5. Equivalence of measurement residuals (Germany, Switzerland, USA)	.926	.042	1.000	1368.173	1397.165	1116.173	501

Note. CFI = comparative fit index; RMSEA = root mean square error of approximation; PCLOSE = probability of close fit; AIC = Akaike information criterion; BCC = the Browne Cudeck criterion; df = degrees of freedom.
Source. Own data 2015

As a consequence, one can conclude that the tested items do not meet the scalar invariance test across the six countries as a whole. Hence, factor means are not comparable across the set of six countries. However, it may still be possible to compare the sustainability-related means across a smaller set of (more homogeneous) countries. Table 3 shows that when tested for scalar invariance among countries with a same economic development level as well as more equal culture fit indices satisfy cut off criteria for Germany, Switzerland and the USA (CFI = .916, RMSEA = .045, P-CLOSE = .996, AIC = 1446.558, BCC = 1476.011, Chi Square = 1190.558, DF = 499). This does

not apply to the set of tested emerging countries: Brazil, China and India (CFI = .893, RMSEA = .047, P-CLOSE = .954, AIC = 1526.377, BCC = 1543.938, Chi Square = 1280.377, DF = 444).

There are important similarities as well as differences among the six countries. To address them the unstandardized estimates are considered as suggested by Davidov and Schmid (2010). Table 4 compares them among countries (Also see the Appendix).

Table 4. Cross-country comparison of unstandardized estimates

Sustainability Factor	Item	Item code	CH	GER	USA	BR	CN	IN
F 1 Ethical Attributes	Ensuring animal welfare	V_166	.70	.49	.91	.57	.66	.66
	Ensuring fair payment of producers	V_208	.92	.88	.97	1.07	.60	.91
	Ensuring good working and living conditions for producers	V_209	.82	.95	1.07	1.01	.71	.75
	Environmentally friendly production	V_210	1.00	1.07	1.10	1.06	.67	.84
	Environmentally friendly packaging	V_211	1.02	1.11	1.11	1.14	.75	.95
	Reducing greenhouse gas emissions	V_212	1.15	1.09	1.15	1.09	.79	.86
F 2 Naturalness	Free from GMO	V_261	1.10	.69	1.50	.51	.40	.54
	Free from chemical pesticides	V_268	.93	.92	.90	1.20	.98	.97
	Free from synthetic fertilizers	V_269	1.02	1.21	1.05	1.37	1.06	.85
	Free from artificial additives	V_270	.95	1.05	.72	1.18	1.25	1.06
F 3 Health-related attributes	Good taste	V_266	.33	.34	.64	.71	.21	.28
	Safe	V_267	1.29	1.06	.87	.98	1.01	1.38
	Fresh	V_271	.95	1.06	.96	.82	1.15	1.15
	Health benefits	V_162	1.47	1.55	.97	.80	1.15	1.49
	High nutritional value	V_163	1.46	1.44	.98	.88	1.10	1.41
F4 Terroir	Seasonal production	V_164	.83	.86	.71	.83	.66	.66
	Local production	V_165	.97	.94	1.09	1.19	1.18	1.18
F 5 Innovation	Following current trends	V_213	.75	.51	.90	1.42	1.04	.92
	Innovative	V_263	1.75	2.06	1.19	.87	.82	.88

The observation of the factor loadings of the items related to the first factor: ethical attributes, gives evidence that with the exception of China the items related to environmentally friendly production (v_210) and environmentally friendly packaging (v_211) constantly score higher than the item related to fair working and living conditions of producers (v_209). Apparently, consumers are more likely to expect environment-related aspects rather than human

empowerment with regard to sustainable food. As already mentioned, China is an exception, which contrasts the findings of Gommersall and Wang (2012).

Another important similarity among all countries is the high loading values of items related to freshness (v_271) and healthy (v_162) or nutritive impacts of food (v_163) with the highest scores among Germany and Switzerland and India, followed by China, the United States, and Brazil. Thus, likewise it happens in Western countries, freshness seems to be a good proxy for sustainable food due to its close linkages to healthiness and safety. Also, the item related to innovative food (v_263) performs quite well among the countries: Germany is placed first, with a loading score of 2.06, followed by Switzerland, the United States, India, Brazil, and China.

Discussion of Results

In the proposed analysis consumer expectations towards sustainable food are examined across three industrialized (Germany, the United States, Switzerland) and three emerging countries (Brazil, China, India).

The five dimensions (ethic attributes; naturalness; health-related aspects; terroir; innovation) identified by the exploratory factor analysis show that consumer expectations regarding sustainable food are more diverse than the common interpretation of sustainability as related only to economic, ecologic and social aspects (FAO 2010; United Nations Environment Program 2010). Many of the underlying issues of the five dimensions have also been described by other studies (e.g., de Cavalho et al. 2015; Lee and Wall 2012; Sautron et al. 2015; Sidali and Hemmerling 2014), although with different contents and for different countries and analytical backgrounds.

The ethical dimension hints at the fact that consumers have higher expectations concerning environmental friendliness attributes (e.g., reduction of greenhouse gas emission, environmentally friendly packaging) compared to social attributes (e.g., fair trade) on an international scale. Hence, it seems that consumers' environmental consciousness is existent both in industrialized and emerging economies, but closer related to sustainability than social considerations. Actually, one should not be surprised by the fact that environmental awareness is also spread among emerging countries as they are often heavily affected by environmental degradation and climate change.

Naturalness is a dimension consisting of several promises that the respective product is free of artificial, chemical or genetically modified inputs. These are integral parts of the organic production standards and often highly discussed issues among consumers that are afraid of negative consequences for the environment. Apart from this more altruistic motivation consumers also relate sustainable food attributes to personal (health) benefits like good taste, freshness, and safety (von Meyer-Höfer et al. 2015). From an empirical point of view evidence of this work confirms Sautron et al. (2015) methodological approach according to which naturalness is distinguished from health. Thus, both are sub-dimensions of sustainability, and, although they can correlate very highly, they should be treated as two standalone dimensions.
Especially food safety has become more and more important in times of severe food scandals affecting consumers in both industrialized and emerging countries like the BSE crisis in Europe

or the melamine scandal in China. From this point of view, marketers should always be sensitive to the relation between safety and trust.

Local production in correspondence to seasonal food production is one of the typically western consumer expectations regarding sustainable food (Sidali and Hemmerling, 2014), but also for consumers in other parts of the world at least the aspect of national / regional production under familiar circumstances and avoiding long transportation distances gain in importance (e.g., Sirieix et al. 2011).

An interesting expectation revealed in this study is described by the factor innovation. Consumers expect sustainable food today to follow current trends. Thus other than the pioneers of organic consumption in Europe who favored more traditional values and were extremely skeptic against modern trends, today alternative food products such as sustainable food seem to match with trendy lifestyles like the Lifestyles of Health and Sustainability.

Limitations

This study suffers from several limitations. The tested scale lacks important sustainability-related items, such as the absence of child labor or recycling, as these were deleted from the factor analyses due to poor item reliability. In a follow-up study that tries to replicate the current sustainability scale, these items should be reintroduced with better wording. Another limitation concerns the number of countries selected for this study, which was reduced to six due to financial constraints.

Future research should include a wider number of countries, including African countries, which in the present study were not included. Thus, to ensure a better understanding of sustainability on the global food market, more work has to be done.

Before starting with the implications chapter, it is important to be reminded of the fact, that the samples of this study are not representative and the results thus not generalizable. However, this exploratory study gives interesting first insights into consumer expectations regarding sustainable food in industrialized as well as emerging countries that should motivate further studies in this field.

Implications

The findings of our study are important from a managerial viewpoint. It offers agri-food market actors in emerging and industrialized countries five dimensions upon which successful sustainability-based differentiation and labeling strategies can be created: Ethical attributes; Naturalness; Health-related attributes; Terroir; Innovation. Food producers and retailers could find a niche in the highly competitive global food market by placing a distinctive mark on the sustainability dimensions revealed by this study. Moreover, it shades light into the specific expectations of consumers in some of the world's leading as well as promising future markets for sustainable food products.
Most of the here tested sustainability attributes are process characteristics or credence goods that cannot be judged by the consumer without the help of certification schemes or labels. Too high

or false consumer expectations are thus a severe risk. From the literature and practical evidence, it is known how disappointment or skepticism can become great barriers to sustainable food consumption. This is why marketers should try to be as clear and transparent about the process characteristics and credence goods of their products.

Marketers that want to address consumer expectations regarding sustainable food should try to use as many of the analyzed aspects as possible, also if this means to have a product labeled with several single sustainability claims or labels. Many of the expected sustainability attributes are already integral parts of the world's leading sustainability certification schemes for organic and fair trade. However, most organic labels focus primarily on the environmental dimension of sustainability, while fair trade schemes focus more on social aspects. A combination of both approaches exists but is still rather limited to special product groups like coffee, cocoa or bananas.

Special attention should be paid to a megatrend across countries: consumers expect that sustainable food should be innovative and trendy. A communication strategy which places emphasis on trends could attract sustainability-sensitive consumers worldwide.

The results of this study invite marketing actors to revise an old and widespread conventional wisdom that in emerging countries all consumers are purely seeking to satisfy their basic material needs without caring about the environmental or ethical aspects of their food consumption. For many years, it was asserted that consumers' environmental concern and the "postmaterialist" value of environmental protection was limited to affluent nations (Dunlap and York 2008, 529; Ingelhart 1977). However, this study rejects this view and supports, in this way, the findings of more recent reports of several international institutions (e.g., BBMG, GlobeScan and SustainAbility 2012, National Geographic and GlobeScan 2012); at least looking at well-educated urban middle classes. Nevertheless, the analysis shows that semi-globalized communication strategies should be considered instead of international strategies that build upon similar consumer expectations regarding sustainable food in every country (Douglas and Craig 2011).

Conclusion

The sustainability of food production and consumption has become a crucial global issue in the agri-food business. As more and more food is marketed using sustainability aspects as marketing cue, it gains market momentum, but most scientific studies only deal with single credence attributes for single products in individual countries or continents. A more comprehensive picture of what consumers expect from sustainable food on a global scale is still missing.

Thus the current exploratory study addresses the question what consumers expect from sustainable food products as such in several industrialized (Germany, the United States, Switzerland) and emerging (Brazil, China, India) countries. Twenty-four items representing sustainable food attributes are tested, and data is analyzed adopting the same methodological approach (multi-group comparison confirmatory factor analyses). This allows cross-country comparisons for the six analyzed countries and gives international agri-food market actors better insights into how to tailor adequate communication strategies.

The findings show that sustainability of food consists of five factors (ethic attributes, naturalness, health-related aspects, terroir, innovation) whose items are comparable across countries due to metric invariance. This confirms the presence of sustainability megatrends in the food market and, accordingly, permits agri-food market actors to tailor specific marketing strategies by adopting a semi-globalized marketing strategy as suggested by Douglas and Craig (2011). Furthermore, as the results of the invariance analysis display only partial scalar invariance, the interpretation of factors' comparison can only be applied to the country subset of the USA, Germany, and Switzerland. Moreover, the partial failure of the scalar invariance analysis for Brazil, China, and India, confirms the necessity for marketing scholars to deepen their analysis of sustainability dimensions in emerging countries. An important future stream of research in marketing science is henceforth the characterization of consumers with preferences for sustainable food on a global level.

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Appendix 1

Table A1. Overview about factors, items and item codes:

Sustainability Factor	Item	Item code
F 1 Ethical Attributes		
	Ensuring animal welfare	V_166
	Ensuring fair payment of producers	V_208
	Ensuring good working and living conditions for producers	V_209
	Environmentally friendly production	V_210
	Environmentally friendly packaging	V_211
	Reducing greenhouse gas emissions	V_212
F 2 Naturalness		
	Free from Genetically Modified Organisms	V_261
	Free from chemical pesticides	V_268
	Free from synthetic fertilizers	V_269
	Free from artificial additives	V_270
F 3 Health-Related Attributes		
	Good taste	V_266
	Safe	V_267
	Fresh	V_271
	Health benefits	V_162
	High nutritional value	V_163
F 4 Terroir		
	Seasonal production	V_164
	Local production	V_165
F 5 Innovation		
	Following current trends	V_213
	Innovative	V_263

Note. Three items had item reliability value less than 0.4 in almost all countries. This led to the deletion of: v_214 (no child labour); v_262 (traditional) and v_272 (convenient).

Appendix 2