

Yormirzoev, Mirzobobo; Li, Tongzhe; Teuber, Ramona

Article — Published Version

Consumers' willingness to pay for organic versus all-natural milk – Does certification make a difference?

International Journal of Consumer Studies

Provided in Cooperation with:

John Wiley & Sons

Suggested Citation: Yormirzoev, Mirzobobo; Li, Tongzhe; Teuber, Ramona (2021) : Consumers' willingness to pay for organic versus all-natural milk – Does certification make a difference?, International Journal of Consumer Studies, ISSN 1470-6431, Wiley, Hoboken, NJ, Vol. 45, Iss. 5, pp. 1020-1029,
<https://doi.org/10.1111/ijcs.12622>

This Version is available at:

<https://hdl.handle.net/10419/230271>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



<http://creativecommons.org/licenses/by-nc-nd/4.0/>

Consumers' willingness to pay for organic versus all-natural milk – Does certification make a difference?

Mirzobobo Yormirzoev¹ | Tongzhe Li² | Ramona Teuber^{3,4} 

¹National Research University Higher School of Economics, Perm Campus, Russian Federation

²Department of Food, Agricultural & Resource Economics, University of Guelph, Canada

³Institute of Agricultural Policy and Market Research, Department of Agricultural Sciences, Nutritional Sciences, and Environmental Management, Justus Liebig University, Giessen, Germany

⁴Centre for International Development and Environmental Research (ZEU), Justus Liebig University, Giessen, Germany

Correspondence

Ramona Teuber, Centre for International Development and Environmental Research (ZEU), Justus Liebig University, Giessen, Germany.
Email: ramona.teuber@agr.uni-giessen.de

Funding information

Academic Fund Program at the National Research University Higher School of Economics (HSE University) in 2019–2020 (grant no 19-01-060) and Russian Academic Excellence Project "5-100"

Abstract

While there is ample evidence on consumers' perceptions and willingness to pay (WTP) for organic food in developed markets, empirical evidence for transition economies is scarce. This paper is based on a survey of 608 Russian consumers that combined a questionnaire with a contingent valuation approach to investigate the impact of perceptions and trust on consumers' WTP for certified organic, uncertified all-natural and conventional milk, respectively. A between-subject treatment design was used to analyse how consumers' WTP responds to different information treatments. Our results suggest that most participants connect health benefits with the consumption of organic food, followed by slightly fewer respondents connecting organic production with environmental benefits. In the case of animal welfare benefits, the picture is less clear, as only 46% of respondents indicated that they agree that organic livestock production is associated with animal welfare benefits. Concerning the trust in farmer's adherence to organic standards, a substantially higher share of respondents expressed trust in producers from the European Union versus their Russian counterparts. About 51% of respondents exhibited a positive WTP for organic milk in comparison to conventional milk. At the same time, there is no statistically significant difference in respondents' WTP between all-natural and organic milk. This similarity suggests that respondents do not seem to differentiate between uncertified all-natural milk and certified organic milk.

KEYWORDS

all-natural milk, contingent valuation, organic milk, Russian Federation, willingness to pay

1 | INTRODUCTION

There is a growing interest in organic products reflected in steadily increasing sales of these products worldwide (Willer et al., 2020). This goes hand-in-hand with a growing number of countries adopting national regulations on organic farming. Currently, around 100 nations have implemented their own regulations on organic food

production (OTA, 2019). In this context, it is important to underline that organic by itself is not an absolute, but a relative concept, meaning that different individuals associate different aspects of what organic agriculture and organic foods mean or stands for (e.g., Darnhofer et al., 2019; Schleenbecker & Hamm, 2013; Seufert et al., 2017). However, as shown by Seufert et al. (2017), most countries have adopted very similar regulations for organic farming,

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2020 The Authors. International Journal of Consumer Studies published by John Wiley & Sons Ltd

focusing mainly on so-called natural versus chemical substances (e.g., organic fertilizer versus pesticides) that are allowed in the production process. Seufert et al. (2017) further argues that this is a direct result of consumers' interest in organic foods, primarily because of health reasons and less because of environmental aspects of food production.

This claim seems to be in line with most of the empirical evidence on consumers' motivation to purchase organic products. Numerous studies highlight that consumers perceive organic products as healthier (e.g., Bruschi et al., 2015; Ditlevsen et al., 2019; Hoefkens et al., 2009; Prada et al., 2017) and that these perceived health benefits are usually the major driving force behind organic food purchases (e.g., Chen, 2009; Magnusson et al., 2003; Rana & Paul, 2020; Schleenbecker & Hamm, 2013; Tsakiridou et al., 2008). Thus, the dominating association with organic food products seems to be naturalness and purity resulting in health benefits (Ditlevsen et al., 2019; Seufert et al., 2017).

Nevertheless, other motives also seem relevant for the adoption of organic food such as environmental and animal welfare concerns (e.g., Katt & Meixner, 2020; Sadiq et al., 2020). Overall, the existing literature shows that consumers' attitudes and perceptions concerning which benefits are associated with organic food are a major determinants of acceptance and the willingness to pay (WTP) a price premium for organic products (Kushwah et al., 2019; Schleenbecker & Hamm, 2013). Moreover, trust in the organic claim (e.g., Britwum et al., 2021; Nuttavuthisit & Thøgersen, 2017), as well as information, seems to play a crucial role in influencing both the acceptance of and WTP for the organic claim (e.g., McFadden & Huffman, 2017; Teuber et al., 2016). Nuttavuthisit and Thøgersen (2017) showed that for a sample of Thai consumers mistrust in the organic claim substantially lowered the likelihood to purchase organic food. In this vein, Britwum et al. (2021) pointed out that the current evidence indicates that there exists a positive correlation between strong trust in organic requirements and a high positive WTP for the organic claim and vice versa.

At the same, it has been stressed that it is necessary to study consumer behaviour in different regions, as perceptions and attitudes might vary (Rodríguez-Bermúdez et al., 2020). Region-specific studies in emerging markets are especially relevant, taking into account, that most of the available empirical evidence so far is related to countries with an already established organic regulation and knowledge on consumers in emerging economies is relative scarce. Exceptions, however, do exist mainly focusing on Asian countries and consumers such as China (e.g., Xie et al., 2015), India (e.g., Basha & Lal, 2019; Sharma et al., 2020), Indonesia (e.g., Arli et al., 2018), Thailand (e.g., Nuttavuthisit & Thøgersen, 2017), Vietnam (e.g., Le-Anh & Nguyen-To, 2020; Pham et al., 2019), among others.

Given this background, this paper aims to contribute new knowledge on consumers' behaviour in the context of organic foods in an emerging market economy. More specifically, we aim at studying consumers' interests and perceptions of "that thing called organic" in a country where no official regulation of organic farming has been

implemented at all or only very recently. The Russian Federation is one of such countries. On January 1st, 2020 an official regulation on organic produce came into force, which introduces references to *organic produce*, *manufacturer of organic produce* and *organic agriculture*, as well as sets control over producing, storing, labelling, selling and transporting organic food.¹ Thus, while organic food is widely available in Europe and North America, it is a niche market in Russia, where imported organic foods are usually only available in specialized stores in major cities.

Existing empirical evidence on Russian consumers indicates that naturalness plays a very prominent role in consumers' purchasing decisions (e.g., Delmond et al., 2018; Dolgoplova et al., 2015; Honkanen & Frewer, 2009). Furthermore, there is evidence that health concerns are an important determinant of purchasing decisions with regard to organic products (Bruschi et al., 2015). However, so far, no study exists that elaborates on WTP for certified organic products and the major determinants of a potential positive WTP.

Thus, the objective of the present paper is threefold. First, it examines whether Russian consumers' exhibit a positive marginal WTP for certified organic milk versus uncertified milk (called all-natural milk), and if so, which factors might explain a higher marginal WTP. It is important to stress that a major difference between organic and all-natural milk is the official certification that is an essential part of regulations on organic farming. Second, the role of information about organic farming in Russian consumers' acceptance and WTP for organic products is analysed. Hence, this specific objective aims at providing new knowledge on how differently framed information about organic farming influences the WTP for organic food. Third, it is investigated whether trust in domestic versus foreign organic food products differs. The latter aspect is especially important for building up a domestic organic food market and closely related to previous study results indicating that mistrust in the certification process decreased both the likelihood of purchasing organic food and WTP. In order to achieve the three objectives stated above, primary data were collected via an in-person survey using a contingent valuation (CV) approach.

The rest of the paper is structured as follows: The next section provides information about the participants and the survey design, with results presented thereafter. Section four discusses the obtained findings, followed by an outlook on future research direction in section five. The last section provides a conclusion.

2 | MATERIAL AND METHODS

2.1 | Recruitment of participants

The data set for the present study was collected via in-person interviews during spring 2019 at multiple locations of "Semya", a single

¹Federal Law No. 280-FZ on Organic Production in Russian Federation. Available in Russian at <http://www.fao.org/faolex/results/details/en/c/LEX-FAOC178322>

major city store chain in Perm, Russia. Perm is home to approximately one million residents and is located about 1,100 km east of Moscow. The survey questions were pretested within focus groups before the actual data collection began.

In total, 608 people were interviewed. Each respondent was provided with a statement on data privacy and informed that data obtained as a result of the survey would be kept anonymous and used only for research purposes. Respondents were selected randomly by an interviewer who approached every third customer. Each interviewee received a monetary reward of 250 rubles (about 4 US dollars) and surveys lasted on average 10–15 min.

2.2 | Elicitation method

A questionnaire in combination with a CV approach was used. Milk was chosen as the examined product since it is bought and consumed by many Russian consumers on a regular basis. Thus, the questionnaire comprised statements related to consumption frequency of milk, perceptions of organic food in general, as well as risk preferences and trust in actors' adherence to organic standards. All these aspects were included due to previous research showing that perceived risk and benefits, as well as trust in actors, are important factors for the acceptance of food products and thus, WTP (e.g., Dolgoplova et al., 2015; Lim and Maynard, 2014).

The CV methodology has been extensively utilized to estimate consumer WTP for products and nonmarket valuations (Carson and Hanemann, 2005; Kanninen, 1993; Li & McCluskey, 2017; Yang et al., 2009). Compared to a revealed preference (RP) approach, CV is a survey-based stated preference (SP) technique, which pertains directly to data reflecting consumer characteristics and choices. Although hypothetical bias is a major drawback for the SP technique as it may overstate the direction for consumer WTP (List & Gallet, 2001), CV is a valuable method when the studied products are not yet available on the market but understanding consumer acceptance is important. If subjects are familiar with a product and the prevailing market price for that particular product, the associated hypothetical bias effect seems to be weaker (Muñoz-García and Li, 2018). This is especially the case when the product is a normal good with relatively low-income elasticity (Muñoz-García and Li, 2018). These characteristics seem to apply to milk.

A double-bounded dichotomous-choice format was utilized in data collection, as it is shown to be asymptotically more efficient compared to the alternative single-bounded model. However, the double-bounded CV may be subject to an anchoring bias from the initial bid. Nevertheless, such bias can be outweighed by the gain in efficiency as the market price for a product under study is used as the initial bid (Hanemann et al., 1991). The CV method has been applied in a wide range of consumer studies (e.g., Mamadzhonov et al., 2019; Yormirzoev et al., 2019).

In a model with a double-bounded dichotomous-choice setting, every respondent is requested to say if they are willing to pay a

specific price, that is, bid for the product under study with binary “yes” or “no” responses. This is called the initial bid (B_i). The following bid is conditional on the response expressed in this initial bid. Should the respondent provide an affirmative answer, then, they are to express their willingness to pay a higher (premium) amount for that particular good (B_p). If their response to the initial bid is negative, the next step is to ask the respondent whether they are willing to pay a lower (discounted) amount, (B_D). The initial bid used in the study is the average market price for conventional milk—55 Russian rubles (about 0.85 US dollars) per liter. Each respondent was randomly assigned four premium (5%, 10%, 20% and 30%) and four discount (5%, 10%, 20% and 30%) amounts. Both premium and discount bids were chosen based upon pretested pilot surveys. Thus, the premium bids were 58 RUB, 61 RUB, 66 RUB and 72 RUB and the discount bids were 52 RUB, 50 RUB, 44 RUB and 39 RUB, respectively.

Using the double-bounded dichotomous choice model with all associated premium and discount outcomes enables us to place the sample participant's true WTP for organic milk into one of four intervals: $(-\infty, B_D)$, (B_D, B_i) , (B_i, B_p) , or $[B_p, +\infty)$ where B_D , B_i and B_p are discounted, initial and premium bids, respectively. This yields to the following discrete outcomes:

$$D = \begin{cases} 1 & WTP < B_D & (\text{No, No}) \\ 2 & B_D \leq WTP < B_i & (\text{No, Yes}) \\ 3 & B_i \leq WTP < B_p & (\text{Yes, No}) \\ 4 & B_p \leq WTP & (\text{Yes, Yes}) \end{cases} \quad (1)$$

where WTP denotes the respondent's WTP (or bid function) for organic/all-natural milk. The individual WTP outcome pertains to the random utility model where a rationally acting respondent maximizes their utility by choosing to purchase the product at the associated bid amount if the utility derived from organic/all-natural milk remains higher compared with their refusal to pay for that particular commodity. Hence, the probability of each outcome can be written as:

$$Pr(Y = j) = \begin{cases} F(v(B_D, R)) \\ F(v(B_i, R)) - F(v(B_D, R)) \\ F(v(B_p, R)) - F(v(B_i, R)) \\ 1 - F(v(B_p, R)) \end{cases} \text{ for } j = \begin{cases} 1 \\ 2 \\ 3 \\ 4 \end{cases}, \quad (2)$$

where $F(\cdot)$ stands for a cumulative distribution function that characterizes the randomized components of utility. The difference in indirect utility function between purchasing a commodity at bid B and declining the bid is represented by $v(B, R)$, with R being a vector of characteristics affecting the indirect utility. The function $v(B, R)$ for consumer i can be expressed as:

$$v(B_i, R_i) = \alpha - \rho' B_i + \mu' X_i, \quad i = 1, 2, 3 \dots n, \quad (3)$$

where B_i is the bid amount offered to respondents i and X_i is the observable characteristics of the survey participant i . α , ρ and μ are unknown parameters to be estimated. The log-likelihood function can be expressed in the following form:

$$\ln L = \sum_{i=1}^n x \left\{ \begin{aligned} &I_{Y_{i=1}} \ln F(\alpha - \rho B_{Di} + \mu' X_i) + \\ &I_{Y_{i=2}} \ln [F(\alpha - \rho B_{ji} + \mu' X_i) - F(\alpha - \rho B_{Di} + \mu' X_i)] + \\ &I_{Y_{i=3}} \ln [F(\alpha - \rho B_{pi} + \mu' X_i) - F(\alpha - \rho B_{ji} + \mu' X_i)] + \\ &I_{Y_{i=4}} \ln [1 - F(\alpha - \rho B_{pi} + \mu' X_i)] \end{aligned} \right\}, \quad (4)$$

where $I_{Y_{ij}}$ is the indicator function for each j outcomes ($j = 1, 2, \dots, 4$) for consumer i . The function $F(g)$ follows the standard logistic distribution having a mean of zero and standard deviation of $\sigma = \pi/\sqrt{3}$. The maximum likelihood method is used to estimate the model.

2.3 | Treatment design

We used a between-subject treatment design to analyse how consumers' preferences for organic milk respond to different information treatments. Along with a control group in which participants did not receive any further information about the concept of organic food, three treatment groups were implemented. Each subject in our study was randomly assigned to one of the four groups. Treatment one introduces organic food from the perspective of the Russian Government, treatment two introduces organic food based on the European Union's (EU) regulations and treatment three includes a general description of organic food without referring to any specific regulation and certifying agency (see Appendix A in supplementary material). To comply with research ethics and prevent deception, specific phrases in each treatment are quotes from reputable sources.

3 | RESULTS

3.1 | Sample statistics

Summary sample statistics are presented in Table 1.

Approximately 67% of customers reported that they are primary shoppers for their households. The mean age of respondents was 36.1 years, which is slightly lower than the average age of 39.9 years of Perm residents. Female shoppers represented 58.6% of survey participants, which is comparable with city census data in 2018, as 54% of residents of Perm are women. The average household size in Perm is three people and 52% of participants reported the presence of minor children in their families. The vast majority of survey participants were city dwellers with 41% and 49.2% reporting to live in the

TABLE 1 Summary statistics of demographic variables ($N = 608$)

Variable	Percentage
Gender	
Female	58.6
Primary household shopper	
Yes	66.9
Presence of children in household	
Yes	48.5
Living environment	
Urban	41.0
Suburb	49.2
Rural	9.9
Education level	
Secondary	6.7
Secondary technical/special	25.3
Student	9.2
Higher (bachelor's, master's and a five-year diploma)	56.1
PhD and higher	2.6
Household income	
Less than 30,000 Rubles	12.5
From 30,000 to 50,000 Rubles	18.1
From 50,000 to 75,000 Rubles	20.1
From 75,000 to 90,000 Rubles	22.0
More than 90,000 Rubles	27.3
Employment status	
Student	9.9
Hired employee	61.8
Individual entrepreneur	14.3
Retired	3.5
Other	10.5
	Mean
Age (in years)	36.1
Household size	3.01

downtown and suburban areas of Perm. The remaining respondents reported residing in rural places.

More than half of the participants have a higher education level pertaining to bachelor's, master's degrees or a 5-year diploma. One-fourth reported having secondary special or technical education and about 7% completed only high school. This confirms a general picture of educational attainment in the country as pursuing post-secondary education, including vocational and university studies in Russia is tuition-free.

For the period under study, the monthly household income of participants ranges between 30,000 and more than 90,000 rubles.² One-third of interviewees have an income level between 30,000 rubles and 75,000 rubles. Ten percent of participants reported a

²The official exchange rate of the Russian ruble to one US dollar is 64.35.

monthly family income of less than 30,000 rubles. The majority of participants (about 62%) are hired employees followed by private entrepreneurs (14.3%), others (10.5%), students (9.9%) and retirees (3.5%).

3.2 | Perceptions of organic foods and trust in adherence to regulatory standards

Table 2 presents information about respondents' attitudes and perceptions towards organic milk. One-third of survey respondents stated that milk pertains to their daily purchased food item. Our results suggest that Russian consumers are moderately informed about the concept of organic farming, with around one-third stating that they do not feel well informed or informed at all about the concept of organic farming. As illustrated in Figure 1, most participants (70%) connect health benefits with the consumption of organic food, followed by slightly fewer respondents connecting organic production with environmental benefits (66%). In the case of animal welfare benefits, the picture is less clear. Only 46% of respondents indicated that they agree that organic livestock production is associated with animal welfare benefits while over one-third chose the option "don't know" when asked about animal welfare benefits of organic livestock production.

Concerning the trust in farmer's adherence to organic standards, approximately 65% of respondents stated believing certified Western farmers follow organic standards, while only 34% stated believing certified Russian farmers will likely follow these standards when they come into effect.

Risk preferences were operationalized via a seven-point Likert scale to quantify participants' opinions concerning the trade-off between food safety and saving money, as well as a self-assessment of their risk attitudes on a ten-point Likert scale. The results show that around half of interviewees considered food safety as most important. In terms of their attitudes towards risk about 20% of the sample characterized themselves to be risk-neutral.

Table 3 reports the correlations between key demographic and attitudinal variables. There is a strong and positive correlation between consumer perception on the health, environmental and animal benefits of organic food, suggesting that individuals who think organic food is beneficial, tend to agree on its benefits in all three dimensions. Participants, who trust that certified Russian farmers will likely comply with organic standards, are also more likely to trust certified Western farmers and vice versa. One explanation might be that these individuals are more confident in the overall agriculture community. Income is positively correlated with education and consumers with higher household incomes reported higher trust in Western farmers. Self-reported subjective risk preferences are not significantly correlated with any of the tested demographic variables. However, risk lovers are more likely to consider food price as more important than food safety, which is intuitive because they may be more willing to take food safety risks while paying lower prices. On the contrary, individuals with higher incomes are more likely to

TABLE 2 Consumer attitude and perception variables (N = 608)

Variables	Percentages (%)
<i>Frequency of milk purchase/consumption</i>	
Daily	29.6
Several times in a week	44.2
Several times in a month	26.2
<i>Awareness about the concept of organic farming</i>	
Very well informed	7.9
Somewhat informed	37.5
I don't know	16.9
Not well informed	20.2
Not informed at all	17.4
<i>Certified Russian farmers follow organic standards</i>	
Very likely	2.6
Likely	31.7
Neither likely nor unlikely	27.1
Unlikely	30.3
Very unlikely	8.2
<i>Certified Western farmers follow organic standards</i>	
Very likely	23.4
Likely	41.9
Neither likely nor unlikely	26
Unlikely	7.1
Very unlikely	1.6
<i>Food safety versus money saving^a</i>	
1 – Food safety is most important	32.1
2	18.4
3	17.8
4	16.6
5	6.7
6	4.6
7 – Money saving is most important	3.8
<i>Risk attitude^b</i>	
1 – Not risk taking at all	10.9
2	6.9
3	13.2
4	9.9
5	17.1
6	8.6
7	9.9
8	9.0
9	4.6
10 – Extremely willing to take risks	10.0

^aSelf-reported measurement by participants to investigate the trade-off between food safety and food prices operationalized on a scale ranging from 1 = food safety is most important to 7 = money saving is most important.

^bRisk attitudes were measured as follows: "Are you in general a risk-taking or a risk-avoiding person? Answer scale ranging from 1 = not risk-taking at all to 10 = extremely willing to take risks.

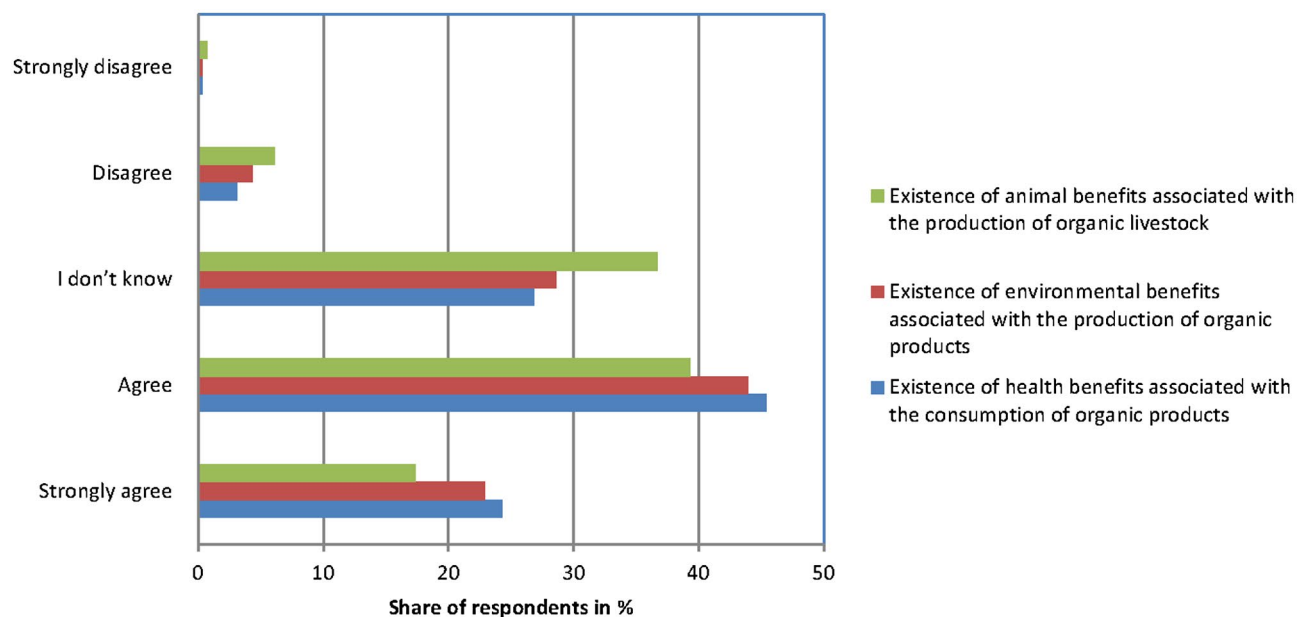


FIGURE 1 Perceptions of organic food benefits [Colour figure can be viewed at wileyonlinelibrary.com]

TABLE 3 Correlations among demographic and attitudinal variables

	Health benefit	Enviro benefit	Animal benefit	Trust Russia	Trust Western	Education	Income	Risk lover	Price important
Health benefit	1.00								
Enviro benefit	0.54 ^a	1.00							
Animal benefit	0.31 ^a	0.45 ^a	1.00						
Trust Russia	-0.01	-0.05	0.03	1.00					
Trust Western	0.07	0.06	0.13 ^a	0.21 ^a	1.00				
Education	0.01	-0.02	-0.07	-0.01	0.07	1.00			
Income	-0.09	-0.08	-0.01	0.06	0.15 ^a	0.29 ^a	1.00		
Risk lover	-0.01	-0.04	-0.01	-0.05	0.07	-0.01	-0.10	1.00	
Price important	-0.18 ^a	-0.15 ^a	-0.11 ^a	-0.01	-0.05	-0.02	-0.19 ^a	0.19 ^a	1.00

Note: $N = 606$.

^aDenote significance at the 1% level.

attach a higher value to food safety than to low food prices; as do participants who believe that organic food is beneficial for their own health, the environment or animal welfare.

3.3 | Estimation results

Table 4 reports the distribution of bids for organic milk and all-natural milk, respectively. It appears that consumer preferences and WTP for organic and all-natural milk are very similar. In total, 401 out of 608 respondents said “yes” to organic milk when the price is the same as conventional milk; 415 out of 607 respondents said “yes” to all-natural milk.

Among those who said “yes” to the initial bid, the likelihood of saying “yes” decreases when the price premium is higher in the

follow-up question. This is true for both organic milk and all-natural milk and it is consistent with economic theory. Among the participants who responded “no” to the initial bid, some are willing to purchase organic/all-natural milk when a price discount was offered in the follow-up question.

Figure 2 specifies the probability distribution of purchasing organic milk and all-natural milk for each bid amount. Although the probability of saying “yes” to each milk product decreases with higher prices, the marginal price effect is relatively small in our tested range, noted by the flatness of the curve. About 40% of our participants are willing to purchase organic or all-natural milk at a 30% price premium, while about 45% of participants refuse to purchase them even at a 30% price discount.

Next, we estimated the marginal effects (ME) of each treatment as well as demographic and attitudinal variables on mean WTP for

TABLE 4 Distribution of bid responses

	Organic Milk				Total
	5%	10%	20%	30%	
Premium (Said Yes to initial bid)					
Yes	94	85	70	61	310
No	10	13	27	41	91
Total	104	98	97	102	401
Discount (Said No to initial bid)					
Yes	3	20	17	15	55
No	45	34	38	35	152
Total	48	54	55	50	207
All-Natural Milk					Total
	5%	10%	20%	30%	
Premium (Said Yes to initial bid)					
Yes	96	77	77	62	312
No	8	18	32	45	103
Total	104	95	109	107	415
Discount (Said No to initial bid)					
Yes	5	12	4	12	33
No	42	45	39	33	159
Total	47	57	43	45	192

organic milk. The results are presented in Table 5. The EU information and general information on organic farming both resulted in a significantly positive effect on participants' WTP for organic milk. The EU information treatment increased the mean WTP for organic milk by 12.0% (p value = .039), all else equal. The general information treatment increased the mean WTP for organic milk by 17.1% (p value = .003). In contrast, the Russian information treatment quoting the fact that there will be Russian legislation on organic farming did not have a significant effect on the mean WTP for organic milk.

Individuals who believe organic food offers health benefits have a higher WTP for organic milk ($ME = 10.7\%$, p value = .000). This was also the case among individuals who reported higher scores for environmental benefits ($ME = 5.8\%$, p value = .051). Belief in animal benefits did not have a statistically significant impact on WTP for organic milk. Among all demographic variables, the only statistically significant variable is the indicator variable for rural residents. Rural residents are more likely to purchase organic milk at the 5% significance level.

Table 5 also reports the marginal effects of each variable on mean WTP for all-natural milk. Interestingly, both the EU information and general information on organic food resulted in a significantly positive effect on respondents' WTP for all-natural milk. However, the Russian information treatment did not have a statistically significant effect, as in the case of organic. Due to randomly assigning participants to one of the four information treatments, one can confidently draw the conclusion that this effect is causal.

We then estimated the mean WTPs under different scenarios using Hanemann's (1984) approach.

$$WTP = \frac{1}{\hat{\rho}}(\hat{\alpha} + \hat{\mu}'\bar{X}). \quad (5)$$

Table 6 provides estimates for organic milk and all-natural milk, respectively. Our data show that the mean WTP for organic and all-natural milk is both higher than WTP for conventional milk. Participants who did not receive any information on what defines a food product as organic were on average willing to pay an 8.78% (4.83 Russian Rubles) premium for organic milk compared to conventional milk. Confidence intervals around the estimated mean WTP are obtained using the delta method (Greene, 2008).³ In the no-information treatment, consumers' mean WTP for all-natural milk is 6.56% higher than for conventional milk. It is interesting to observe that the WTP for organic and all-natural milk is comparable in each treatment.

4 | DISCUSSION

Our results show that 51% of respondents exhibit a positive WTP for organic milk in comparison to conventional milk. Moreover, a central finding is that there is no statistically significant difference in WTP between all-natural and organic milk. This similarity suggests that consumers do not seem to differentiate between uncertified milk called all-natural and certified organic milk. Thus, they may not be aware of the differences between these two products. This hypothesis is strengthened by the fact that information about organic milk increased WTP for all-natural milk in the same pattern as organic milk. So all-natural milk seems to be synonymous with organic milk and vice versa. This finding is consistent with recent studies conducted in the United States (e.g., McFadden & Huffman, 2017).

Furthermore, the major factor explaining this positive WTP, excluding the effect of the information treatment, is the perceived health benefits, followed by environmental benefits. Thus, the discussion that only health benefits seem to play a role in purchasing organic products and these perceptions shape organic regulations, might not fully hold in the Russian case. However, the results also indicate that the aspect of animal welfare is not especially pronounced in Russia so far. This is in line with previous results presented by Bruschi et al. (2015) for a sample of consumers from St. Petersburg.

With respect to socio-demographic factors, the only variable that showed up in our analysis as statistically significant is the place of residency. One potential explanation is that rural residents anticipate and value the positive externalities of organic food production more strongly than urban participants. Moreover, many studies have shown that sociodemographic variables are usually not very good at predicting consumer behaviour, at least

³The delta method is widely used to determine confidence intervals on the WTP estimates, along with the Krinsky-Robb and bootstrap methods and has been found to produce reasonably accurate and similar results compared to other methods (Hole 2007).

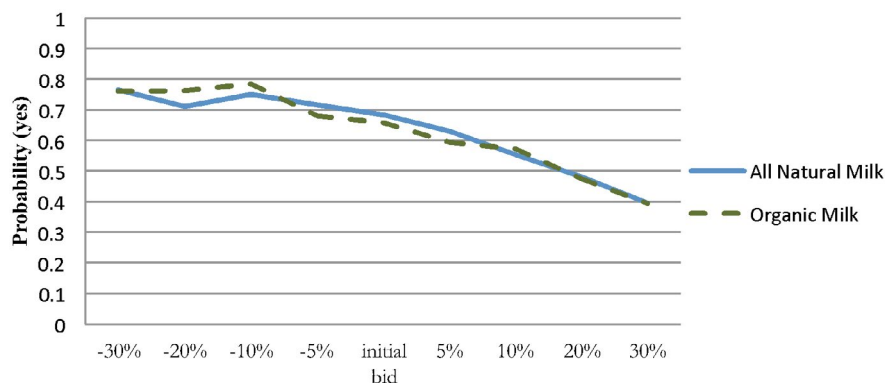


FIGURE 2 Estimated probability of choosing all-natural and organic milk given bids [Colour figure can be viewed at wileyonlinelibrary.com]

Variable	Organic Milk		All-Natural Milk	
	Marginal Effect (Standard Error)	p-value	Marginal Effect (Standard Error)	p-value
Russian info	0.051 (0.053)	.334	0.062 (0.057)	.273
EU info	0.120** (0.058)	.039	0.221*** (0.064)	.001
General info	0.171*** (0.058)	.003	0.174*** (0.062)	.005
Health benefit	0.107*** (0.030)	.000	0.100*** (0.032)	.002
Environ benefit	0.058* (0.030)	.051	0.026 (0.032)	.410
Animal benefit	-0.007 (0.026)	.802	0.032 (0.028)	.258
Education	0.014 (0.019)	.470	-0.065*** (0.021)	.002
Income	0.016 (0.016)	.311	0.035*** (0.017)	.045
Female	-0.032 (0.042)	.447	-0.035 (0.044)	.430
Age	0.002 (0.002)	.224	0.004** (0.002)	.047
Rural	0.149** (0.073)	.039	-0.019 (0.076)	.798
Child in household	-0.040 (0.036)	.267	-0.021 (0.039)	.587
Primary shopper	-0.046 (0.042)	.277	0.062 (0.045)	.167
Risk lover	0.006 (0.007)	.400	-0.004 (0.008)	.609
Price important	-0.003 (0.012)	.778	-0.012 (0.013)	.341

TABLE 5 Marginal effects of the explanatory variables on mean WTP for organic milk and all-natural milk

Note: $N = 606$; Log-likelihood = -663.44.

a, **, *** denote significance at a 10%, 5% and 1% level, respectively.

TABLE 6 Estimates of Mean WTP for Organic and All-Natural Milk (in percentage discount or premium compared to conventional milk)

Sample	Organic milk		All-natural milk	
	Mean WTP (Z-value)	95% Confidence interval	Mean WTP (Z-value)	95% Confidence interval
No information	+8.78% (23.81)	[-0.18%; +17.73%]	+6.56% (21.68)	[-3.07%; +16.19%]
Russian info	+10.28% (30.10)	[+ 3.10%; +17.46%]	+8.39% (27.64)	[+0.70%; +16.07%]
EU info	+12.30% (31.13)	[+ 5.23%; +19.37%]	+13.06% (28.96)	[+5.41%; +20.72%]
General info	+13.82% (31.25)	[- 6.68%; +20.96%]	+11.68% (28.76)	[-4.07%; +19.29%]

not directly. In fact, there might be indirect effects of certain socio-demographic variables via their impact on attitudes and perceptions (e.g., Padilla et al., 2013).

Another noteworthy result is that approximately 45% of participants refuse to purchase organic products even when a 30% price discount is offered. This remarkable result indicates that for

a relatively large share of respondents, organic products are not vertically differentiated from conventional ones. In fact, horizontal product differentiation seems to be more appropriate given our results. It might be also a result of a general mistrust in certifications by Russian consumers reported in previous studies (e.g., Dolgoplova et al., 2015). This finding is closely related to the

results regarding trust in Russian farmers and their adherence to organic standards. The reported results in our study are quite striking with respect to the development of a local organic market. Only one-third of respondents indicated trusting farmers' adherence to standards. Thus, the results indicate that trust in local entrepreneurs and businesses is very low. Bruschi et al. (2015) already highlighted in their study on consumers from St. Petersburg that mistrust in domestic control authorities was widespread. In such a situation, it might be very hard to implement a credible and trustworthy organic farming sector in Russia. This result is strengthened by our empirical findings that the Russian information treatment had no significant impact on the WTP for organic milk. In terms of managerial implications, our results paint a clear picture: Domestic Russian farmers/producers need to find ways to regain consumers trust. Otherwise, a substantial part of Russian consumers might not be willing to buy domestic organic products at all.

5 | DIRECTIONS FOR FUTURE RESEARCH

To the best of our knowledge, the presented study is the first one providing empirical evidence on WTP for organic milk in Russia, a country that just recently established domestic regulation on organic agriculture. However, certain limitations should be kept in mind. First, as in all survey studies, the sample is not fully representative of all of Russia. Second, our methodological approach is hypothetical based on respondents' stated preferences.

Future research building upon this study can address these limitations using nonhypothetical approaches such as experimental auctions in a controlled laboratory environment or field experiments in a simulated marketplace. Relevant research questions comprise, for example, effective labelling, specifically the credibility and trustworthiness of different certifying agencies. This seems to be highly relevant in a market environment where our results underline strong consumer mistrust in domestic stakeholders. Along these lines, analyses addressing questions of compliance seem to be important.

Moreover, the current Covid-19 crisis and its potential impact on consumer behaviour in general and food choice in particular, can have relevant venues for future research. For example, if online grocery shopping becomes more popular, how will consumers respond in terms of preferences for food products labelled local, organic or all-natural? Will individuals put more value on certifications and how does it interact with their trust in domestic versus Western stakeholders? These questions warrant further investigation.

6 | CONCLUSIONS

The presented study provides valuable insights into Russian consumers' perceptions of organic food and their WTP a price premium for either organic or all-natural milk in comparison to conventional milk. Results from the study are of great importance because they provide new information on the potential consumption of organic

food in Russia. Findings on consumers' preferences for organic food and their trust level on domestic farmers can inform policymakers. Moreover, quantitative comparisons among consumers' willingness to pay for organic, all-natural and conventional food can help domestic companies in designing production capacity and marketing strategies.

ACKNOWLEDGMENTS

The authors would like to thank Vitaliy Svetlakov and Victoria Steshina for their excellent assistance in survey arrangements, data collection and processing. We are also grateful to Olena Myrna for her inputs in editing and proofreading of the Russian version of the survey questionnaire and to Nicholas Bannon and Conor Smith for proofreading the manuscript. Open access funding enabled and organized by ProjektDEAL.

ORCID

Ramona Teuber  <https://orcid.org/0000-0001-6283-0438>

REFERENCES

- Arli, D., Tan, L. P., Tjiptono, F., & Yang, L. (2018). Exploring consumers' purchase intention towards green products in an emerging market: The role of consumers' perceived readiness. *International Journal of Consumer Studies*, 42(4), 389–401. <https://doi.org/10.1111/ijcs.12432>
- Basha, M. B., & Lal, D. (2019). Indian consumers' attitudes towards purchasing organically produced foods: An empirical study. *Journal of Cleaner Production*, 215, 99–111. <https://doi.org/10.1016/j.jclepro.2018.12.098>
- Britwum, K., Bernard, J. C., & Albrecht, S. E. (2021). Does importance influence confidence in organic food attributes? *Food Quality and Preference*, 87. <https://doi.org/10.1016/j.foodqual.2020.104056>
- Bruschi, V., Shersheneva, K., Dolgoplova, I., Canavari, M., & Teuber, R. (2015). Consumer perception of organic food in emerging markets: Evidence from Saint Petersburg, Russia. *Agribusiness: An International Journal*, 31(3), 414–432. <https://doi.org/10.1002/agr.21414>
- Carson, R. T., & Hanemann, W. M. (2005). Contingent valuation. *Handbook of Environmental Economics*, 2, 821–936.
- Chen, M.-F. (2009). Attitude toward organic foods among Taiwanese as related to health consciousness, environmental attitudes, and the mediating effects of a healthy lifestyle. *British Food Journal*, 111(2), 165–178. <https://doi.org/10.1108/00070700910931986>
- Darnhofer, I., D'Amico, S., & Foulleux, E. (2019). A relational perspective on the dynamics of the organic sector in Austria, Italy, and France. *Journal of Rural Studies*, 68, 200–212. <https://doi.org/10.1016/j.jrurstud.2018.12.002>
- Delmond, A. R., McCluskey, J. J., Yormirzoev, M., & Rogova, M. M. (2018). Russian consumer willingness to pay for genetically modified food. *Food Policy*, 78, 91–100. <https://doi.org/10.1016/j.foodpol.2018.02.004>
- Ditlevsen, K., Sandoe, P., & Lassen, J. (2019). Healthy food is nutritious, but organic food is healthy because it is pure: The negotiation of healthy food choices by Danish consumers of organic food. *Food Quality and Preference*, 71, 46–53. <https://doi.org/10.1016/j.foodqual.2018.06.001>
- Dolgoplova, I., Teuber, R., & Bruschi, V. (2015). Consumers' perceptions of functional foods: Trust and food-neophobia in a cross-cultural context. *International Journal of Consumer Studies*, 39(6), 708–715. <https://doi.org/10.1111/ijcs.12184>
- Greene, W. H. (2008). *Econometric analysis*, 6th ed. Prentice Hall.

- Hanemann, W. M. (1984). Welfare evaluations in contingent valuation experiments with discrete responses. *American Journal of Agricultural Economics*, 66(3), 332–341. <https://doi.org/10.2307/1240800>
- Hanemann, W. M., Loomis, J., & Kanninen, B. (1991). Statistical efficiency of double bounded dichotomous choice valuation. *American Journal of Agricultural Economics*, 73(4), 1255–1263.
- Hoefkens, C., Camp, J. V., Verbeke, W., Aertsens, J., & Mondelaers, K. (2009). The nutritional and toxicological value of organic vegetables: Consumer perception versus scientific evidence. *British Food Journal*, 111(10), 1062–1077. <https://doi.org/10.1108/00070700920992916>
- Hole, A. R. (2007). WTP: Stata module to estimate confidence intervals for willingness to pay measures.. Statistical Software Components S456808. Boston College Department of Economics, revised 01 Oct 2007. <https://ideas.repec.org/c/boc/bocode/s456808.html>.
- Honkanen, P., & Frewer, L. (2009). Russian consumers' motives for food choice. *Appetite*, 52(2), 363–371. <https://doi.org/10.1016/j.appet.2008.11.009>
- Kanninen, B. J. (1993). Optimal experimental design for double-bounded dichotomous choice contingent valuation. *Land Economics*, 69(2), 138–146. <https://doi.org/10.2307/3146514>
- Katt, F., & Meixner, O. (2020). A systematic review of drivers influencing consumer willingness to pay for organic food. *Trends in Food Science & Technology*, 100, 374–388. <https://doi.org/10.1016/j.tifs.2020.04.029>
- Kushwah, S., Dhir, A., Sagar, M., & Gupta, B. (2019). Determinants of organic food consumption. A systematic literature review on motives and barriers. *Appetite*, 143, 104402. <https://doi.org/10.1016/j.appet.2019.104402>
- Le-Anh, T., & Nguyen-To, T. (2020). Consumer purchasing behaviour of organic food in an emerging market. *International Journal of Consumer Studies*, 44, 1–11. <https://doi.org/10.1111/ijcs.12588>
- Li, T., & McCluskey, J. J. (2017). Consumer preferences for second-generation bioethanol. *Energy Economics*, 61, 1–7. <https://doi.org/10.1016/j.eneco.2016.10.023>
- Lim, K. H., & Maynard, L. J. (2014). A taste for safer beef ? How much does consumers' perceived risk influence willingness to pay for country-of-origin labeled Beef. *Agribusiness*, 30(1), 17–30.
- List, J. A., & Gallet, C. A. (2001). What experimental protocol influence disparities between actual and hypothetical stated values? *Environmental and Resource Economics*, 20, 241–254.
- Magnusson, M. K., Arvola, A., Koivisto Hursti, U.-K., Albert, L., & Sjoden, P.-O. (2003). Choice of organic foods is related to perceived consequences for human health and to environmentally friendly behavior. *Appetite*, 40(2), 10–117.
- Mamadzhanov, A., McCluskey, J. J., & Li, T. (2019). Willingness to pay for a second-generation bioethanol: A case study of Korea. *Energy Policy*, 127, 464–474. <https://doi.org/10.1016/j.enpol.2018.12.001>
- McFadden, J. R., & Huffman, W. E. (2017). Willingness-to-pay for natural, organic, and conventional foods: The effects of information and meaningful labels. *Food Policy*, 68, 214–232. <https://doi.org/10.1016/j.foodpol.2017.02.007>
- Muñoz-García, F., & Li, T. (2018). Explaining hypothetical bias variations using income elasticity of demand. *Homo Oeconomicus*, 35(3), 207–224. <https://doi.org/10.1007/s41412-018-0076-5>
- Nuttavuthisit, K., & Thøgersen, J. (2017). The importance of consumer trust for the emergence of a market for green products: The case of organic food. *Journal of Business Ethics*, 140(2), 323–337. <https://doi.org/10.1007/s10551-015-2690-5>
- OTA. (2019). *Global Organic trade guide - A resource for international organic trade designed for U.S. exports*. Available at: <http://www.globaorganictrade.com/index.php>. Accessed 03.09.2019.
- Padilla, C., Cordts, A., Schulze, B., & Spiller, A. (2013). Assessing determinants of organic food consumption using data from the German National Nutrition Survey II. *Food Quality and Preference*, 28, 60–70. <https://doi.org/10.1016/j.foodqual.2012.08.010>
- Pham, T. H., Nguyen, T. N., Phan, T. T. H., & Nguyen, N. T. (2019). Evaluating the purchase behaviour of organic food by young consumers in an emerging market economy. *Journal of Strategic Marketing*, 27, 540–556. <https://doi.org/10.1080/0965254X.2018.1447984>
- Prada, M., Garrido, M. V., & Rodrigues, D. (2017). Lost in processing? Perceived healthfulness, taste and caloric content of whole and processed organic food. *Appetite*, 114, 175–186. <https://doi.org/10.1016/j.appet.2017.03.031>
- Rana, J., & Paul, J. (2020). Health motive and the purchase of organic food: A meta-analytic review. *International Journal of Consumer Studies*, 44(2), 162–171. <https://doi.org/10.1111/ijcs.12556>
- Rodríguez-Bermúdez, R., Miranda, M., Oriaes, I., Ginzo-Villamayor, M. J., Al-Soufi, W., & López-Alonso, M. (2020). Consumers' perception of and attitudes towards organic food in Galicia (Northern Spain). *International Journal of Consumer Studies*, 44(3), 206–219. <https://doi.org/10.1111/ijcs.12557>
- Sadiq, M., Paul, J., & Bharti, K. (2020). Dispositional traits and organic food consumption. *Journal of Cleaner Production*, 266. <https://doi.org/10.1016/j.jclepro.2020.121961>
- Schleenbecker, R., & Hamm, U. (2013). Consumers' perception of organic product characteristics. A Review. *Appetite*, 71, 420–429. <https://doi.org/10.1016/j.appet.2013.08.020>
- Seufert, V., Ramankutty, N., & Mayerhofer, T. (2017). What is this thing called organic? – How organic farming is codified in regulations. *Food Policy*, 68, 10–20. <https://doi.org/10.1016/j.foodpol.2016.12.009>
- Sharma, N., Saha, R., Sreedharan, V. R., & Paul, J. (2020). Relating the role of green self-concepts and identity on green purchasing behaviour: An empirical analysis. *Business Strategy and the Environment* (February), 1–17. <https://doi.org/10.1002/bse.2567>
- Teuber, R., Dolgoplova, I., & Nordström, J. (2016). Some like it organic, some like it purple and some like it ancient: Consumer preferences and WTP for value-added attributes in whole grain bread. *Food Quality and Preference*, 52, 244–254. <https://doi.org/10.1016/j.foodqual.2016.05.002>
- Tsakiridou, E., Boutsouki, C., Zotos, Y., & Mattas, K. (2008). Attitudes and behavior towards organic products: An explanatory study. *International Journal of Retail and Distribution Management*, 36(2), 158–175.
- Willer, H., Schlatter, B., Travnicke, J., Kemper, L., & Lernoud, J. (eds.) (2020). *The World of Organic Agriculture. Statistics and Emerging Trends 2020*. Research Institute of Organic Agriculture (FiBL), Frick, and IFOAM. : Organics International. Online available at <https://www.fibl.org/fileadmin/documents/shop/5011-organic-world-2020.pdf> (Accessed 09.09.2020).
- Xie, B., Wang, L., Yang, H., Wang, Y., & Zhang, M. (2015). Consumer perceptions and attitudes of organic food products in eastern China. *British Food Journal*, 117(3), 1105–1121. <https://doi.org/10.1108/BFJ-09-2013-0255>
- Yang, N., McCluskey, J. J., & Ross, C. F. (2009). Willingness to pay for sensory properties in Washington state red wines. *Journal of Wine Economics*, 41(1), 81–93. <https://doi.org/10.1017/S193143610000699>
- Yormirzoev, M., Teuber, R., & Li, T. (2019). Food quality versus food patriotism: Russian consumers' preferences for cheese after the food import ban. *British Food Journal*, 121(2), 371–385.

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

How to cite this article: Yormirzoev M, Li T, Teuber R.

Consumers' willingness to pay for organic versus all-natural milk – Does certification make a difference?. *Int J Consum Stud*. 2021;45:1020–1029. <https://doi.org/10.1111/ijcs.12622>