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**The effect of information on consumer choice
(the case of product with new properties)**

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The effect of information on consumer choice (the case of product with new properties)

Abstract

In the modern world very concentrated informational environment forms consumer preferences well before a potential buyer goes to the shop to make purchases. The production of new commodities triggers economic agents' demand for objective information necessary for taking decisions about their safety or further use. This study uses economic experiment to investigate the effect of information about the product with new properties on behavior of the Russian consumers and proves that new information can alter individual perceptions and evoke response. It turns out that women are more receptive to any information concerning food products. The results also emphasize discrepancy between actual participants' behavior and their initial estimates made in questionnaires.

JEL Classification: D12, Q13

Key words: economic experiment, effect of information, product with new properties, consumer behavior

Introduction

In the modern world information is a very important factor of the society's economic and political life.

An individual lives in a very concentrated informational environment. TV, radio, press and Internet form consumer preferences well before a potential buyer goes to the shop to make purchases. Due to the specific personal characteristics, cultural norms and values, socio-demographic status the assessment of and response to the same news or event by different persons may be non-typical and ambiguous.

The production of new commodities triggers economic agents' demand for objective information necessary for taking decisions about their safety or further use. Given incompleteness of information the emergence on the market of food products with new properties just increases

consumers' concerns about quality and safety of foodstuffs.

According to data of the survey carried out by the All-Russian Center of Studying Public Opinion (WCIOM, 2005) most Russian residents are concerned about the use of GMO in food products especially the ones for infant nutrition.

This study is devoted to the consideration of individual decision-making when choosing a food product based on a new technology in the situation when this choice is influenced by information.

Method

Different research methods are applied to investigate consumer demand and help to fill the information gap due to the lack of reliable data. Qualitative methods (depth interview, focus group, projective technique) are used very often.

One of the popular approaches to reveal consumers' response to new commodities, product properties and non-market values is to establish their willingness to pay for them. This indicator is widely used and estimated by means of such methods as *choice experiment* and *contingent valuation method* enabling to form a database and to assess the importance of different consumer demand characteristics, especially in case of new food products. However, the above methods have their bottlenecks (Rigby D. et al, 2004).

Most researchers-experimentalists also apply this approach when carrying out economic experiments and estimate the effect of information on consumer demand by means of auction mechanism (Lusk J.L. et al 2004; Tegene A. et al, 2003).

To study the subjective motivation of real people's behavior we find that experimental methods are much better.

Experiment as a special method of economic analysis has gained a strong position in the economic science's arsenal and at the moment is one of the most popular ways to verify a wide range of behavioral economic theories: from individual behavior to the theory of public choice (Belyanin A, 2003; Kagel J. et al, 1995).

Until recently economists-theoreticians suggested new theoretical constructions basing on the

homo economicus model. The customary model supposed that a person behaves rationally pursuing his own interests and surrendering all feelings and emotions to reckoning. But when experimental verification of basic postulates of the traditional economic theory started, it became clear that the theory somewhat deviates from real life. Nowadays, when describing individual behavior of consumers one cannot do without examining psychological sides of decision-making, as human decisions base not only on rational considerations but also on subconscious acts such as emotions, moral principles, personal experience.

The advantage of experiment over other methods of establishing consumer preferences is that as compared with passive observation its regulated conditions allow to much better control and single out the impact of examined factors from the others. To stimulate individuals to reveal their true consumer intentions the experiments' organizers try to create conditions that are maximally close to the day-to-day life of buyers. The experiment's participants face real money and real commodities and consequently make their choice with greater responsibility and rationality. In case of polling respondents have no incentives to tell the truth. At the same time respondents' answers can be greatly influenced by public opinion. For instance, some individuals are ready to consume products containing GMO and will probably buy them in their day-to-day life. But when filling the questionnaire they will probably remember of negative public opinion and join the majority.

Second, as different from polls, experiment supposes usage of common homogeneous units – money or real commodities – for measuring consumer preferences. As a rule, people differently interpret such phrases as “absolutely agree” and “agree” used in questionnaires – it depends on their impressions and qualitative appraisals. Meanwhile money or physical measures are understandable for any respondent (Noussair C. et al, 2004).

Third, the participant's position accumulates his attitude to a product based on its qualitative parameters. It's difficult for questionnaire developers to catch the degree of importance of product's taste, look and price for a consumer.

Still, this method also has some bottlenecks. Its efficiency primarily depends on the individuals' receptivity, their ability to apprehend the proposed mechanism (Belyanin A., 1998).

Experimental design

The purpose of our experiment is to evaluate the effect of information on consumer choice (all other factors being controlled) taking a product with new properties as an example. One of such products is sausage "Doctor" designed with the assistance of Russian Meat Union¹ together with the Institute of Nutrition of the Russian Academy of Medical Sciences (RAMS). It is made out of lean meat, contains lower percent of fat (5,6 g. per 100 g.) and less calories (105 kcal per 100 g.) and is recommended by the RAMS Institute of Nutrition as a curative and prophylactic food product. So, sausage "Doctor" is the product with new properties, dietary product.

To achieve the experiment's goal an ordinary sausage brand "Doctor's" was used as a product-substitute. Sausage brand "Doctor's" is a caloric product (fat: 22,2 g. per 100 g.; 257 kcal per 100 g.).

Selection of participants

67 respondents of Moscow and Moscow region were selected to participate in our project. Each individual took part in just one session out of seven carried out. The size of the group averaged 10 persons since it's difficult for a moderator to control a group of over 15-20 persons – there is always a risk of discussion between participants sitting side by side. The experiment was carried out from the 25th of June to the 25th of July 2007. Each session lasted about one hour.

Quota sampling was applied to select individuals for the survey's sampled population the forming of which based on statistical data about socio-demographic characteristics of the RF population (Rosstat, 2006).

The results of market study aimed to estimate consumer demand for dietary products (carried out in 2002 under the aegis of the Russian Meat Union) were used to determine the age structure of the group preferring healthy food products. According to the survey, the greatest interest in dietary products is shown by men aged over 35 and by women aged over 25.

⁶ The author thanks Russian Meat Union and personally Musheg Mamikonyan for the materials they provided for our study.

As a result the participants of our project were 26 men and 41 women. When selecting the participants we took into account age and the education level of RF population.

We certainly understand that the size of the sample is rather small and will probably preclude us from extending the study's results to the general population. Still, it's hopefully sufficient for verifying the hypothesis that underlies our research.

One more necessary condition of the experiment was that all the invited participants should be buyers of sausage products for their families.

Potential participants were recruited by means of telephone interviews in one interval of acquaintance (among friends of interviewer's acquaintances).

It should be noted that when selecting individuals for participation in the experiment potential recruits were not informed of its details. They were just told that it was carried out in purely research purposes and was targeted at studying consumer demand. It was necessary to ensure that a potential respondent didn't contemplate the problem and was unconstrained and spontaneous.

Place: 3 sessions were carried out in the AFE Centre of the Institute for Economy in Transition (IET). Others took place on the territory of the RF Ministry for Economic Development and Trade.

Plan of the experiment:

The experiment participants were to distribute the aggregate physical volume of sausage between two brands that were offered to them at the project's start.

Taking into account that when in a shop an individual chooses between commodities in kind, we asked the participants to distribute 600 grams of sausage between the product with new properties (brand "Doctor") and the ordinary brand "Doctor's".

In the course of each session individuals were given identification numbers. All participants received special lists to be filled in with their estimates.

Before start of the experiment participants were assured that their participation in the project wouldn't entail any expenditures and at the end of the session each of them will get a valuable present.

According to the experiment's terms each participant was to receive the desired quantity of one sausage brand (we had sufficient stock of only dietary brand). The desired quantity of the second brand organizers decided to compensate with money. The name of the brand that organizers were ready to present to the experiment's participants (the dietary product) as well as the fact that the caloric brand will be exchanged for money remained a secret till the end of the session.

1st stage: Before start of the experiment participants were asked to fill in a questionnaire containing questions about the respondent's socio-demographic status, his way of life and preferences. Then organizers proceeded to explaining the terms and procedure of the experiment.

Participants were asked not to communicate with each other.

2nd stage: Participants were shown brands "Doctor" and "Doctor's" (they could see their slices and information on the label) and were asked to indicate in special forms how many grams of "Doctor" and "Doctor's" brand they would like to get within the set limit (600 grams). Then the forms were handed in to moderator.

We intentionally didn't provide participants with any additional information about the product with new properties; they could learn only facts indicated on the label.

3rd stage: Participants were provided with additional information about the product with new properties and were asked to redistribute the 600-gram limit. They filled in the results in the new forms (Attachment 1).

4th stage started with tasting of samples after which participants were to redistribute the 600-gram limit between the two brands. At the same time they were asked to estimate the brands' taste in special lists.

5th stage: The results were summed up.

At the end of the experiment each participant got as many grams of the dietary sausage as he had indicated in his form at the 4th stage. The desired quantity of the caloric brand "Doctor's" was compensated with money at the rate of 20 rubles per 100 grams of "Doctor's" sausage.

The sequence of stages was such that to have an opportunity to trace the effect of the studied factor given that all other factors were under control. Since organoleptic properties of the product were important for consumers and could outweigh the effect of information, the decision was taken to conduct tasting only after participants had been acquainted with information materials. Throughout the sessions their format remained unchanged.

To achieve the project's purpose we have formulated and tested a hypothesis about the effect of information on forming the consumers' attitude towards products especially the ones with new properties.

Basic hypothesis (H₀): Russian consumers are indifferent to information about special properties of sausage, i.e. information won't have a significant effect on consumers' decisions.

Alternative hypothesis (H₁): Information about product properties received by consumers plays an important role in the process of choosing commodities. Consequently, information about the old and the new brand triggers change of an individual's initial position.

$$H_0: \frac{\sum_{i=1}^n b_i^2}{n} = \frac{\sum_{i=1}^n b_i^3}{n}$$

$$H_1: \frac{\sum_{i=1}^n b_i^2}{n} \neq \frac{\sum_{i=1}^n b_i^3}{n}$$

where b is physical volume of the dietary sausage chosen by consumers;

$\frac{\sum_{i=1}^n b_i^2}{n}$ is the mean value of physical volume of the dietary sausage chosen by consumers before

learning the information;

$\frac{\sum_{i=1}^n b_i^3}{n}$ is the mean value of physical volume of the dietary sausage chosen by consumers after

learning the information; upper indexes 2, 3 – number of the stage.

To verify the hypothesis supposing change of mean values of the desired quantity of “Doctor” sausage before and after the information shock we used parametric and non-parametric tests.

Of special interest is the investigation of the effect of factors impelling an individual to take one or another decision that he finds more or less justified.

As such we regarded factors of socio-demographic nature, e.g. age, gender, level of education, etc.

The effect of the named exogenous variables on the change of desired physical volume of “Doctor” brand after providing information to respondents was estimated by means of testing the logistic regression model that can be generally presented as follows:

$$\ln \left[\frac{p}{1-p} \right] = B_0 + B_1 X_1 + B_2 X_2 + \dots + B_n X_n,$$

where p is the probability of response to information and $X_1, X_2 \dots X_n$ are variable values.

Research results

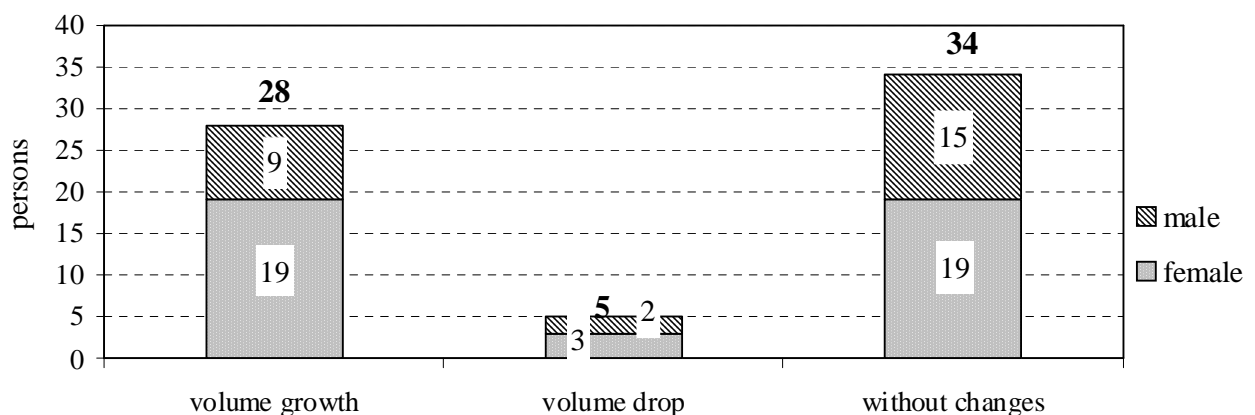
One should note the results of the second stage of our study (visualization) – 36% of participants made their choice in favour of the dietary brand after the very first glance at it and indicated in their forms maximum number of grams offered by the experiment organizers. When the testing ended, they stated that their choice was influenced by the sausage’s colour (rose, close to the colour of meat) that according to the individuals’ opinion evidenced larger contents of meat in the product. The label of “Doctor” brand that in large letters read “No soybeans” didn’t remain unnoticed either. Taking into account the widely spread conviction of Russian consumers that genetically modified organisms (GMO) are harmful, the absence of their notorious representative – soybeans – played a certain role in making a choice. At the same time one should note one more particularity of consumer behavior determination that is due to curiosity and boredom of habitual products. An individual often wishes to try something unusual to satisfy his curiosity.

Other information on the label, in particular the product’s ingredients, was not taken in by respondents. One should take into account that not any person has specific knowledge in the field of

food production technology and “can read” labels. It’s interesting that about 60% of respondents asserted in their questionnaires that when choosing sausage products they are governed by information about their ingredients. Still, they confessed that in practice (during the second stage of the experiment) information about product ingredients did not matter. So, the experimental method helped to reveal discrepancy in determination of consumer behavior.

At the third stage of the experiment (when participants were provided with additional information) an individual had to either finally confirm the position that he had expressed at the first stage or to change it. Out of 67 participants 34 adhered to their choice of the dietary brand (Figure 1). 5 persons revised their estimates in favour of caloric brand. From our point of view their behavior was due to the rejection of what they considered to be an informational pressure from organizers. Another explanation is the individual preference of more caloric and fatted sausage.

Figure 1. The effect of information on volume change of the product with new properties.



It’s worth reminding that information for the third stage of the experiment was provided by the Institute of Nutrition of the Russian Academy of Medical Sciences (RAMS).

So, 72% of all participants have actually taken the view of the named source into account. The calculation included estimates of those respondents who had chosen 600 grams of the dietary brand at the second stage and hadn’t revised their position after learning the comments of the Institute of Nutrition.

It's interesting that among these 72% over one half of individuals expressed no confidence in the named source in their questionnaires. Besides, according to questionnaires over 54% of the ones who increased the ratio in favour of the dietary sausage do not consider recommendations of research institutions. However, they have demonstrated positive response to information of the Institute of Nutrition. So, the revealed discrepancy between data of the poll and the experiment results proves the thesis about behavioral peculiarities of individuals, i.e. the expressed intentions don't always coincide with the actual actions of a person.

Participants noted that information about the contents of lean meat in the sausage and recommendations of the RF Institute of Nutrition had largely motivated them to change the ratio.

Participants whose families had children under 18 were more apt to prefer the product with new properties. As a rule consumers having small children choose food products with bigger carefulness and responsibility. Out of 22 persons having children under 18, 16 had either increased the ratio in favour of the new brand or confirmed its maximum volume after the third stage.

The factor of healthy nutrition is more important for elderly people (55 and over). 80% of participants belonging to this age group have listened to the information.

The results of Wilcoxon non-parametric test prove the statistical validity of differences between values of the second (visualization) and the third (information) stages for the sample consisting of 67 persons (Table 1). Consequently, we got convinced that the experiment participants were influenced by additional information about the product's quality and safety. This means that when choosing food products an individual is governed not only by his personal perceptions and consumption stereotypes but also by exogenous information.

Table 1. Wilcoxon Signed Ranks Test

		N	Mean Rank	Sum of Ranks
visualization information	- Negative Ranks	28(a)	16.11	451.50
	Positive Ranks	5(b)	22.00	109.50
	Ties	34(c)		
	Total	67		
<i>a</i> visualization information	<			
<i>b</i> visualization information	>			
<i>c</i> visualization information	=			
Z		-3.081(a)		
Asymp. Sig. (2-tailed)		.002		

a Based on positive ranks.

b Wilcoxon Signed Ranks Test

To determine correlation between the dependent variable and the set of non-dependent predictors for the sample consisting of 67 persons we applied logistic regression. Dichotomous variable having two values is used as the dependent variable. In our logistic analysis we estimate the effect of information on the individual consumer behavior. The value “1” implies that the participant has revised the ratio of desired physical volumes of two sausage brands in favour of the dietary brand or retained the new product’s position at the maximum level in response to additional information. Similarly, the “0” value corresponds to the answers expressing either no change in position or a negative response to information about new product qualities. Regression determinants included gender, age, level of education, presence of children under 18 in the family and frequency of purchasing cooked sausage, price of the sausage.

So, the log regression equation is as follows:

$$\ln \left[\frac{p}{1-p} \right] = B_0 + B_1 G + B_2 A + B_3 E + B_4 CH + B_5 F + B_6 PR ,$$

where p is the probability of expected positive effect of information, G is the value of gender variable, A is age, E – level of education, CH – presence of children under 18 in the family, F – frequency of purchasing cooked sausage by a person, PR – price of the sausage.

The results of Wald criterion indicate correlation between gender and individual behavior (the changing of initial position) in the conditions of informational pressure (Table 2). This fact statistically proves the thesis that women are more receptive to information concerning healthy way of life and nutrition. The caring for relatives and near ones has always been a prerogative of the female half of humankind.

Unfortunately, the correlation between revision of individual position and other exogenous variables such as age and level of education turned out to be statistically non-significant.

Table 2. The results of Wald criterion

Variable	Coefficient	S.E.	Wald	Sig.
Constant	.154	.393	.154	.695
Gender	1.426*	.572	6.221	.013

Summary statistics

N	67
-2 Log likelihood	73.367
Chi-square	6.538

* Statistically significant at the 5% level

As a result, the log regression equation became as follows:

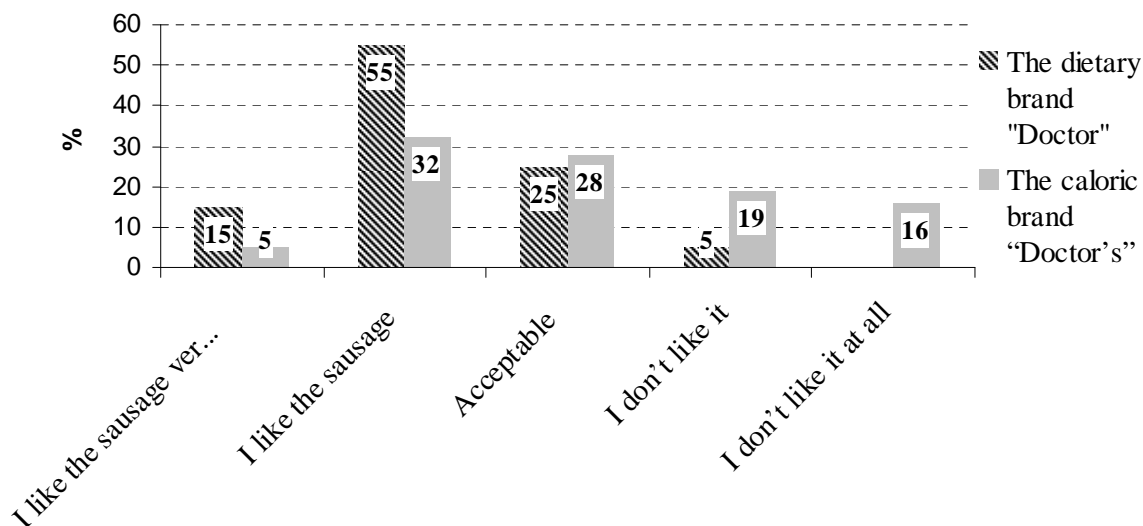
$$\ln \left[\frac{p}{1-p} \right] = 1,43 * G$$

where p is the probability of event and G is the value of gender variable.

The appertaining to female gender increases the probability of expected positive response to information by 80%.

The tasting round (stage 4) of the experiment generally confirmed participants' positions in the sausage choice. The ones who had preferred the new product after the informational round did not change their mind after the fourth stage. The non-parametric Wilcoxon criterion did not show differences between values of the third and the fourth stages. The diagram given below (Figure 2) reflects taste preferences of the participants.

Figure 2. Frequency distribution of responses (taste preferences of the participants).



At the outcome of the project participants preferred to get 29.5 kg of the dietary brand “Doctor” and 10.9 kg of the caloric brand “Doctor’s”. The experiment organizers compensated the desired quantity of the caloric brand “Doctor’s” with money at the rate of 20 rubles per 100 grams of sausage.

Conclusions

In our study we focused on estimating the effect of information on consumer choice of food products with new properties.

To study consumer behavior we used laboratory experiment allowing to distinguish the effect of the examined factor from the others and to reduce the probability of getting non-reliable data from participants. The application of experimental approach when project participants faced real commodities and behaved more rationally and with greater responsibility enabled us to reveal discrepancy between their actual behavior and the initial estimates made in questionnaires.

The results of the experiment confirmed a large-scale effect of information on consumer behavior and proved that new information about a product could alter individual perceptions and evoke response. The Institute of Nutrition of the Russian Academy of Medical Sciences was considered to be a reliable and reputable source of information about consumption of food products. From our point of view recommendations given by the Institute can be used for promoting both traditional products (e.g. milk) in order to advocate healthy way of life and commodities with new properties.

When estimating the influence of socio-demographic factors on receptivity to information we have revealed correlation between gender and probability of positive response to information. It turned out that women are more receptive to any information concerning food products and thus are a more important target group for marketing specialists and producers of foodstuffs.

Certainly, our research is a modest contribution to the examination of individual consumer behavior when taking decisions about purchase of food products. Still, it's one of the first studies based on the experimental determination of consumer behavior in the Russian agrifood sector.

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Attachment 1

<i>Name of the cooked sausage brand</i>	<i>Protein, %</i>	<i>Fat, %</i>	<i>Caloric value, kcal/ 100 grams</i>
"Doctor"	12.8	5.6	105
"Doctor's"	12	22	257

Dear participant!

You have 600 grams of cooked sausage at your disposal.

Your task is to distribute this physical volume between two sausage brands.

Please, indicate how many grams of each brand you would like to get.

"Doctor" sausage

_____ grams

"Doctor's" sausage

_____ grams