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STUDY ON CONSUMER CONFIDENCE IN THE FOOD PRODUCTS LABELLING SYSTEM

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Abstract

The research revealed that when consumers read this information, they are most interested in the list of ingredients, substances causing allergies or intolerance, the date of minimum durability or use-by date and the net quantity on the food. In addition to the descriptive analysis that revealed how these factors influence consumer confidence in the information read on labels, the results of the study showed gender differences in the importance of reading label information. The frequency of reading label information is influenced by people who engage in daily physical activity. Regarding the frequency of reading label information, the χ2 test revealed significant differences between food poisoners and healthy people. The results of this study may be useful to companies and institutions dealing with food safety. They, through specially designed programmes (as exist in other countries for the uninformed, in our case discussing men, the elderly and those with no formal education), can improve the frequency of reading and confidence in label information.

Key words*: labels, food products, consumer information, frequency of reading information.*

INTRODUCTION

Recently, both producers and consumers have been increasingly interested in the features on labels. Consumers are equally interested in: food safety (Caswell & Joseph, 2008); technological processes underlying the production of food (Harper et al., 2007); nutrition declaration on labels; nutritional components provided by the food consumed (Gracia & Magistris, 2016); a healthy lifestyle (World Health Organizations, 2003); rational consumption of food to avoid food waste (Stenmarck et al. 2016; Marin et al., 2019).

Producers are interested in presenting, in a competitive way, the quality characteristics of food products (Gracia & Magistris, 2016) to convince consumers to frequently purchase products from a particular brand (Liljander et al., 2009).

Due to food safety issues reported in recent decades, it has been necessary to develop legislation at European level to be implemented in all EU countries.

Thus, the European Parliament and Council approved Regulation 1169/2011 where clarifications are made with reference to the information to consumers about the characteristics of food products (Euro Commerce and Food Drink Europe, 2013). In Romania, ANPC has developed a legislative guide for consumer protection, which details legislative aspects of food labelling and marketing (ANPC, 2015).

MATERIALS AND METHODS

Materials

For this study we interviewed 151 people, 104 female and 47 male, from both urban (98 people) and rural (53 people) areas. In order to identify whether the objectives pursued in the study varied by age, one of the items targeted this characteristic.

The people participating in this study fall into the following categories: 20-30 years (129 people), 31-40 years (11 people), 41-50 (3 people), 51-60 (7 people) over 60 (2 people). Educational level is also a factor influencing the objectives of this study.

For this item we had 4 response variants, namely: high school level (40 persons), professional level (6 persons), university studies (97 persons), post-graduate studies (8 persons).

Methods

To carry out this study, we designed a questionnaire with 18 items. The questionnaire was structured in 2 sections: a. socio-demographic data (4 items); b. trust in the information on the labels.

Data processing methodology

Interpretation of the questionnaire was done through numerical (graphs) and summative presentation of the data. The test of differences significance was carried out using the Pearson chi test (test of association).

RESULTS AND DISCUSSIONS

The frequency of reading the information (Table 1) on the label is influenced by young, urban people and the number of years spent in university education.

It seems that when consumers read this information, they are most interested in the list of ingredients, substances causing allergies or intolerance, the date of minimum durability or use-by date and the net quantity of the food.

Another aspect of the study was to identify the extent to which there is confidence in the information provided by producers on food labels (Table 2).

The majority of respondents (43.05%) have a neutral attitude towards the truthfulness of the information on labels. Only 11.26% were in total agreement with this item. Out of the total number of people who do physical activity on a daily basis (42), about a quarter agreed that the information on the labels is consistent with the characteristics of the product.

People who have been diagnosed with food poisoning and who read label information more frequently are more confident about the truthfulness of the information on the label (52.55%).

Lately, people have become more health-conscious, which is why they are more careful about the food they buy. The survey found that only 6.62% of respondents never read the ingredient list and 23.81% always read the ingredient list on the label. In terms of age category, of those who read the ingredient list very often, 88.74% are in the 20-30 age group.

Table 1. Frequency of reading label information by individual characteristics

Specification		Never		Rarely		Sometimes		Very often		Ever	
		N=9	5.96%	N=24	15.89%	N=61	40.40%	N=30	19.87%	N=27	17.88%
Gender	Female	5	55.56	14	58.33	42	68.86	23	76.67	20	74.07
	Male	4	44.44	10	41.67	19	31.14	7	23.33	7	25.93
Domicile	Urban	7	77.78	14	58.33	44	72.13	18	60	15	55.56
	Rural	2	22.22	10	41.67	17	27.87	12	40	12	44.44
Level of education	High school studies	2	22.22	6	25	15	24.60	10	33.33	7	25.93
	Professional studies	1	11.11	1	4.17	1	1.63	0	0	3	11.11
	University studies	6	66.67	17	70.83	43	70.49	19	63.34	12	44.44
	Postgraduate studies	0	0	0	0	2	3.28	1	3.33	5	18.52
Age	20-30	9	100	22	91.67	55	90.16	26	86.66	17	62.97
	31-40	0	0	2	8.33	4	6.56	2	6.67	3	11.11
	41-50	0	0	0	0	1	1.64	0	0	2	7.41
	51-60	0	0	0	0	0	0	2	6.67	4	14.81
	over 60	0	0	0	0	1	1.64	0	0	1	3.70
Smoking frequency	Yes	5	55.56	11	45.83	17	27.87	9	30	9	33.33
	Occasionally	0	0	1	4.17	9	14.75	3	10	5	18.52
	No	4	44.44	12	50	35	57.38	18	60	13	48.15
Body weight	Underweight	0	0	2	8.30	3	4.92	1	3.33	1	3.70
	Normal	8	88.89	18	75.00	53	86.89	26	86.67	21	77.78
	Overweight	1	11.11	4	16.70	5	8.19	3	10	5	18.52
Frequency of physical activity	Daily	2	22.22	9	37.60	16	26.23	6	20	9	33.33
	Weekly	2	22.22	5	20.83	13	21.31	9	30	5	18.52
	Occasionally	2	22.22	7	29.17	25	40.98	13	43.33	10	37.04
	Monthly	0	0	3	12.50	3	4.92	2	6.67	2	7.41
	Never	3	33.34	0	0	4	6.56	0	0	1	3.70
Food poisoning	Yes	5	55.56	7	29.17	17	27.87	10	33.33	16	59.26
	No	4	44.44	17	70.83	44	72.13	20	66.67	11	40.74

Table 2. Dynamics of truthfulness of information on labels in relation to respondent characteristics

Specification		Total disagreement		Disagreement		Neutral		Agreement		Total agreement	
		N=1	0.66%	N=9	5.96%	N=65	43.05%	N=59	39.07%	N=17	11.26%
Gender	Female	1	100	7	77.78	43	66.16	41	69.50	12	70.59
	Male	0	0	2	22.22	22	33.84	18	30.50	5	29.41
Domicile	Urban	1	100	8	88.89	40	61.53	36	61.01	13	76.47
	Rural	0	0	1	11.11	25	38.47	23	38.99	4	23.53
Level of education	Secondary school	0	0	0	0	0	0	0	0	0	0
	High school studies	0	0	1	11.11	23	35.38	14	23.73	3	17.65
	Professional studies	0	0	0	0	3	4.62	2	3.39	1	5.88
	University studies	1	100	7	77.78	37	56.92	38	64.40	13	76.47
	Postgraduate studies	0	0	1	11.11	2	3.08	5	8.47	0	0
Individual monthly income (RON)	Less than 1500	1	100	3	33.33	32	49.23	26	44.07	7	41.18
	1501-3000	0	0	2	22.22	15	23.08	15	25.43	4	23.53
	3001-5000	0	0	4	44.45	7	10.76	8	13.56	0	0
	50001-8000	0	0	0	0	2	3.08	4	6.78	4	23.53
	8000-10000	0	0	0	0	1	1.54	1	1.69	0	0
	More than 10000	0	0	0	0	2	3.08	1	1.69	1	5.88
	other	0	0	0	0	6	9.23	4	6.78	1	5.88
Age	20-30	1	100	7	77.78	57	87.69	49	83.06	15	88.24
	31-40	0	0	2	22.22	4	6.15	3	5.08	2	11.76
	41-50	0	0	0	0	1	1.54	2	3.39	0	0
	51-60	0	0	0	0	2	3.08	4	6.78	0	0
	over 60	0	0	0	0	1	1.54	1	1.69	0	0
Smoking frequency	Yes	0	0	4	44.45	24	36.92	18	30.51	5	29.41
	Occasionally	0	0	5	55.55	8	12.31	2	3.39	3	17.65
	No	1	100	0	0	33	50.77	39	66.10	9	52.94
Body weight	Underweight	0	0	0	0	3	4.62	3	5.08	1	5.88
	Normal	1	100	8	88.89	53	81.54	49	83.05	15	88.24
	Overweight	0	0	1	11.11	9	13.84	7	11.87	1	5.88
Frequency of physical activity	Daily	0	0	3	33.33	19	29.23	14	23.72	6	35.29
	Weekly	1	100	5	55.56	12	18.46	12	20.38	4	23.53
	Occasionally	0	0	1	11.11	22	33.85	28	47.45	6	35.30
	Monthly	0	0	0	0	8	12.31	2	3.38	0	0
	Never	0	0	0	0	4	6.15	3	5.07	1	5.88
Food poisoning	Yes	0	0	2	22.22	15	23.08	31	52.55	7	41.18
	No	1	100	7	77.78	50	76.92	28	47.45	10	58.82

Even if they are not interested in doing frequent physical activities for health maintenance, people are careful about what they eat. For example, 43.59% of those who do physical activity occasionally chose to read the ingredient list very often. Of those who experienced food poisoning, 62.86% said they always read the ingredient list (table 3).

Significance testing for the variable: frequency of reading label information.

We used the chi-square test of association to test the relationship between the two variables, both measured on the categorical scale.

Before moving on to the actual test, it was useful to create a framework to synthetically represent the values of the two variables. What is called a correspondence table is obtained. This is a correspondence table for two nominal variables, one of which is represented by the gender/food poisoning and the other by the levels of the measurement scale (A - Never; B - Very rarely; C - Sometimes; D - Very often; E - Always).

Determination of statistical decision criteria in any of the variants addressed:

- Choose α=0.05 (P=95%), for significant differences.
- GL=degree of freedom = (2-1)*(5-1) = 4
- the tabular $\chi 2$ value for these conditions is 9.49.

Table 3. Reading frequency of ingredients

Specification		Never		Rarely		Sometimes		Very often		Ever	
		N=10	6.62%	N=20	13.25%	N=47	31.13%	N=39	25.82%	N=35	23.18%
Gender	Female	9	90	8	40	31	65.96	32	82.05	24	68.57
	Male	1	10	12	60	16	34.04	7	17.95	11	31.43
Domicile	Urban	9	90	11	55	30	63.83	28	71.80	20	57.14
	Rural	1	10	9	45	17	36.17	11	28.20	15	42.86
Level of education	Secondary school	0	0	0	0	0	0	0	0	0	0
	High school studies	1	10	5	25	12	25.53	11	28.21	11	31.43
	Professional studies	0	0	1	5	2	4.26	0	0	3	8.57
	University studies	9	90	14	70	32	68.08	27	69.23	15	42.86
	Postgraduate studies	0	0	0	0	1	2.13	1	2.56	6	17.14
Individual monthly income (RON)	Less than 1500	9	90	6	30	19	40.43	24	61.54	11	31.44
	1501-3000	1	10	6	30	11	23.40	9	23.08	9	25.72
	3001-5000	0	0	5	25	8	17.02	4	10.26	2	5.71
	50001-8000	0	0	0	0	3	6.38	0	0	7	20
	8000-10000	0	0	0	0	0	0	0	0	2	5.71
	More than 10000	0	0	1	5	1	2.13	0	0	2	5.71
	other	0	0	2	10	5	10.64	2	5.12	2	5.71
Age	20-30	10	100	19	95	40	85.11	35	88.74	25	71.43
	31-40	0	0	1	5	4	8.51	3	7.69	3	8.57
	41-50	0	0	0	0	2	4.25	0	0	1	2.86
	51-60	0	0	0	0	0	0	1	2.56	5	14.28
	over 60	0	0	0	0	1	2.13	0	0	1	2.86
Smoking frequency	Yes	5	50	8	40	13	27.66	11	28.21	14	40
	Occasionally	0	0	4	20	6	12.77	3	7.69	5	14.29
	No	5	50	8	40	28	59.57	25	64.10	16	45.71
Body weight	Underweight	0	0	3	15	2	4.25	1	2.56	1	2.86
	Normal	7	70	16	80	43	91.50	32	82.05	28	80
	Overweight	3	30	1	5	2	4.25	6	15.38	6	17.14
Frequency of physical activity	Daily	1	10	9	45	15	31.91	9	23.07	8	22.86
	Weekly	3	30	3	15	8	17.02	9	23.08	11	31.43
	Occasionally	5	50	6	30	17	36.17	17	43.59	12	34.29
	Monthly	0	0	2	10	3	6.38	3	7.69	2	5.71
	Never	1	10	0	0	4	8.51	1	2.56	2	5.71
Food poisoning	Yes	4	40	5	25	13	27.66	11	28.21	22	62.86
	No	6	60	15	75	34	72.34	28	71.79	13	37.14

a. Research problem: We want to find out if there are significant differences between female and male individuals in the frequency of reading label information.

The values in the cells represent the number of cases (observed frequencies) that correspond to combinations of the two variables (Table 4.a). The column totals express the number of individuals who chose a particular level of the scale, regardless of gender, and the row totals represent the number of individuals correspond-ding to each gender. At the intersection of the two totals we find the overall total of the research subjects (N = 151)

Research Hypothesis (HA): The frequency distribution of reading label information depends on whether the gender is "female" or "male".

Null hypothesis (H_0): The choice of levels A, B, C, D, E is unrelated to the variable gender.

The calculated $\chi 2$ value is smaller than the tabular $\chi 2$, in which case the null hypothesis is accepted, i.e. the choice of scale levels in the item is not influenced by the gender variable in terms of the frequency of reading food label information (Table 4.b).

Table 4.a. Correspondence table for gender characteristic

Specification	Never	Rarely	Sometimes	Very often	Ever	Total columns
Gender						
Female	5	14	42	23	20	**104**
Male	4	10	19	7	7	**47**
Total lines	**9**	**24**	**61**	**30**	**27**	**151**

Table 4.b Testing the significance of differences between the two sexes in the frequency of reading labels

Gender	Observed frequency f_O	Expected frequency f_A	$f_O - f_A$	$(f_O - f_A)^2$	$\frac{(f_O - f_A)^2}{f_A}$
Female A*	5	6,1983	-1,1983	1,435923	0,231663987
Female B*	14	16,5288	-2,5288	6,394829	0,386890121
Female C*	42	42,0107	-0,0107	0,000114	0,000002713
Female D*	23	20,661	2,339	5,470921	0,264794589
Female E*	20	18,5949	1,4051	1,974306	0,106174597
Male A*	4	2,8017	1,1983	1,435923	0,512518432
Male B*	10	7,4712	2,5288	6,394829	0,855930699
Male C*	19	18,9893	0,0107	0,000114	0,00000600
Male D*	7	9,339	-2,339	5,470921	0,585814434
Male E*	7	8,4051	-1,4051	1,974306	0,234893816
Total columns	**151**	**151**	**0**		**3,178689429**

*A - Never; B - Very rarely; C - Sometimes; D - Very often; E - Always;

b. Research problem: To test whether there are significant differences between people who have experienced food poisoning and those who have not, given the levels of the measurement scale (A, B, C, D, E) in terms of frequency of reading label information (Table 5.a.).

At the intersection of the two totals in the correspondence table, we find the overall total of research subjects (N = 151). The column totals express the number of individuals who chose a certain level of the scale, regardless of whether they had food poisoning or not, and the row totals represent the number of individuals corresponding to the two response options: 'yes' or 'no'.

Research hypothesis (H_A): The frequency distribution of reading label information depends on the two categories of people.

Null hypothesis (H_0): The choice of levels A, B, C, D, E is not related to the variable food poisoning.

In this case the calculated $\chi 2$ value is higher than the tabulated one, in which case we reject the null hypothesis and accept the research hypothesis (Table 5.b). This highlights that people who have suffered from food poisoning are more interested in the information provided by producers on food labels.

Table 5.a. Correlation table for the characteristic food poisoning

Specification	Never	Rarely	Sometimes	Very often	Ever	Total columns
Food poisoning						
Yes	5	7	17	10	16	**55**
No	4	17	44	20	11	**96**
Total lines	**9**	**24**	**61**	**30**	**27**	**151**

Table 5.b. Testing the significance of differences between the two individuals in the frequency of reading labels

Food poisoning	Observed frequency f_O	Expected frequency f_A	$f_O - f_A$	$(f_O - f_A)^2$	$\frac{(f_O - f_A)^2}{f_A}$
Yes A*	5	3,2778	1,7222	2,965973	0,904866935
Yes B*	7	8,7408	-1,7408	3,030385	0,346694197
Yes C*	17	22,2162	-5,2162	27,20874	1,22472531
Yes D*	10	10,926	-0,926	0,857476	0,078480322
Yes E*	16	9,8334	6,1666	38,02696	3,867121805
No A*	4	5,7222	-1,7222	2,965973	0,518327364
No B*	17	15,2592	1,7408	3,030385	0,198593939
N0 C*	44	38,7838	5,2162	27,20874	0,701549163
No D*	20	19,074	0,926	0,857476	0,044955227
No E*	11	17,1666	-6,1666	38,02696	2,215171062
Total lines	**151**	**151**	**0**		**10,10048533**

*A - Never; B - Very rarely; C - Sometimes; D - Very often; E - Always

CONCLUSIONS

The frequency of reading label information is influenced by young, urban people and the number of years spent in university education. Frequency of reading label information is influenced by people who are physically active on a daily basis.

Most people in this category are female, and people who are occasionally physically active are not so interested in reading the information on the label.

It seems that when consumers do read this information, they are most interested in the list of ingredients, substances causing allergies or intolerance, the date of minimum durability or the use-by date.

Females attach more importance to the information that is required by law to be included on the label than males.

Half of the respondents consider that products marketed in Romania are of poorer quality than those marketed in other EU countries.

We thus observe that a decrease in confidence in the information on the label can lead (according to the secondary data sources mentioned in the paper) to a decrease in the frequency of reading the information on the label and, ultimately, can negatively influence consumer health.

An important element in informing consumers is the perception of beneficial food innovations. This study shows that people aged between 31 and 60 are the least confident about the benefits of technological innovations.

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