

## Consumers' food label reading behaviour

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**Abstract.** The paper presents the results of a non-probabilistic research based on questionnaire targeted to students from Cluj-Napoca (Romania). The objective was to analyze (student) consumer behaviour related to food label information reading. The label items tested are: (a) Es (food additives); (b) expiration date; (c) energy value (number of calories); (d) all ingredients; (e) only the main ingredients; (f) type of processing (boiled, fried, raw, etc.); (g) country of origin (production); (h) manufacturer's name; (i) importer's name; (j) brand; (k) quantity (pieces, grams, kg); (l) various logos that give specific information (name them); (m) price; (n) nutrition information: carbohydrates, fats, proteins, fibers etc. – quantity; (o) nutrition information: carbohydrates, lipids, proteins, fibers etc. – % of the RDA (recommended daily amount); (p) storage conditions; (q) allergens; (r) preparation time (where is the case); (s) other information. The items that are read "Very often/Always" by the highest percentages of the consumers tested are: expiration date (51% of them), brand (41%), quantity (40%), price (48%); at the other end of the scale, the items that are read "Very rarely/Never" by the highest percentages of the consumers tested are: various logos (35%), allergens (42%), other information (85%).

**Key Words:** food label, reading frequency, consumer behaviour, information.

**Introduction.** At EU level, regulations on what information must be communicated to consumers and how to do it have been increasing during the last decades in the sense of providing more information to consumers, so they can make informed choices. Directive 79/112 in 1979 was the first legal act that implemented agreed EU-wide controls on food labelling and it was gradually amended to introduce additional controls and labelling requirements, until 2000, when the original 1979 Directive and its amendments were consolidated into a single new Directive - Directive 2000/13/EC (Jukes 2014). Directive 2000/13/EC sets detailed labeling, giving the exact nature and characteristics of the product, enabling the consumer to make his choice in full knowledge of the facts (Petrescu-Mag 2013). The new EU Regulation 1169/2011 on the provision of food information to consumers changes existing legislation on food labelling and combines 2 Directives into one legislation: (1) 2000/13/EC - labelling, presentation and advertising of foodstuffs, which is the main EU legislation on the subject; (2) 90/496/EEC - nutrition labelling for foodstuffs. The new rules will apply from 13 December 2014. The obligation to provide nutrition information will apply from 13 December 2016. According to Directive 2000/13/EC, Art. 1, 3 (a) " 'labelling' shall mean any words, particulars, trade marks, brand name, pictorial matter or symbol relating to a foodstuff and placed on any packaging, document, notice, label, ring or collar accompanying or referring to such foodstuff" (Directive 2000/13/EC). By using the information provided on labels, consumers have the power to influence the market – to reward one product/company by choosing and buying it, to sanction another by rejecting it – and to achieve their personal health, wellbeing objectives – by choosing the products that meet their needs and desires. However, if consumers are not aware of these possibilities, of the options they have, if they do not use the opportunities offered by the publication of label information, the purpose of the label is not achieved and customers' opportunities are lost. Increasing

label use is not a simple task: “only when labelling policy is embedded in a broader nutrition policy that uses multiple instruments to increase interest in healthy eating can both understandability, and use of nutrition information on food labels be expected to increase” (Grunert et al 2010). Study results showed that individuals who frequently read nutrition labels tend to both value healthy eating and engage in healthy dietary practices more than individuals who read labels infrequently (Graham & Laska 2012), that labels affect their food choices (Martinez et al 2012), that front-of-pack nutrition label formats may influence the healthfulness of consumers’ food choices (Aschemann-Witzel et al 2013).

**Material and Method.** A non-probabilistic research based on questionnaire was used to collect data on behavior related to label information reading for food. We focused the research on students, because we considered them to be an important segment of consumers for at least three reasons: they are relatively young people and their habits are likely to be maintained for the rest of their adult life, they are educated people, so they have more chances to be opinion leaders, to transmit their behaviour to others, they are numerous (around 20% of the population): 67982 students in Cluj-Napoca in 2008-2009 from a population of 307136 inhabitants (in 2011, according to INSSE (a); the total number of students in Romania for 2008-2009 was 907353 students, according to INSSE(b)). We used a convenience sample of students; sample size was 102 students (which provided valid questionnaires) from two universities in Cluj-Napoca (Romania).

The objective of the study was to see how frequently our consumers read the information printed on food labels.

Statistical analysis was carried out using the software SPSS version 21. For comparison of differences regarding a categorical variable, between two groups, we used the Mann-Whitney U test. The level of statistical significance was set at  $p < 0.05$ .

**Interest in food characteristics.** We wanted to know how much interest people consider they have in the characteristics of the food they buy. We asked: “When you buy food, how much do you care about its characteristics: a) Very little b) Little c) Average d) Much e) Very much?”.

This is not a direct evaluation of their interest, but its approximation, based on the evaluation of their self-perception of their interest.

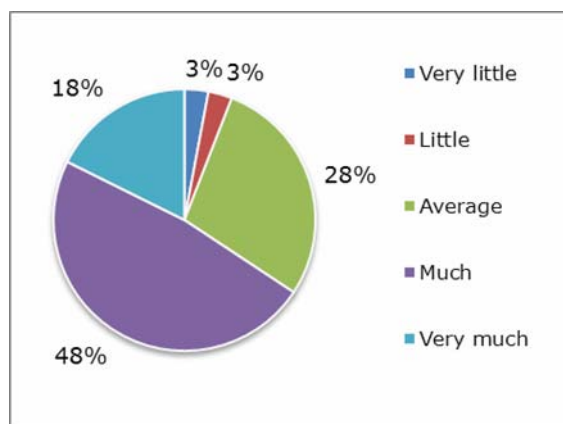


Figure 1. Consumers’ self-evaluation of interest in the characteristics of the food they buy (source: study data).

Around one fifth of consumers declare they are very interested in the features of the food they buy, almost half mentioned a high interest and 32% of them declare to have moderate, low or very low interest in the characteristics of their food. The figures as resulted from the survey would represent a satisfactory situation if they would be accompanied by correspondent behavior when consumers were selecting/buying their food. However, there are factors that will reduce the percentages of consumers acting

according to these declared levels on interest, such as: (a) reading label information, being interested in, is perceived as a positive feature, so some consumers will tend to see themselves or to declare to be on a higher level than they really are; (b) the path from word/interest to action is long and deterring factors may intervene – difficulty to read the labels, unavailability of information, lack of choice, of time to choose etc. In an ideal situation, the percentages of consumers “very much” and “much” interested in food characteristics should be higher, taking into account that the sample belongs to a category of consumers with the highest chances to have a pro-label reading behavior – young people, educated people, from urban areas, living and shopping in an environment with a very diversified offer in terms of shops, products, brands, interested in their appearance and health, with high exposure to mass media information and advertising on food and other commodities.

In order to evaluate the overall frequency of label reading we asked: “How often do you read the information of the label/package when you buy food: a) [0%-20%], b) [21%-40%], c) [41%-60%], d) [61%-80%], e) [81%-100%] of the cases when you buy?”.

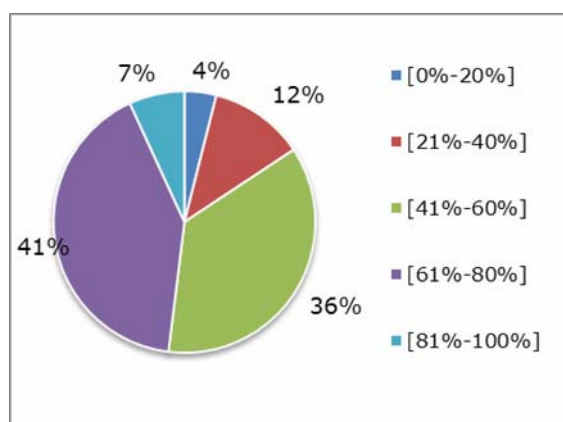


Figure 2. Consumers' self-evaluation of label information reading frequency (source: study data).

We used a scale of frequency intervals, which provided more accurate estimation of the studied action (reading of label information) than an estimation based on a scale Likert-type scale such as “Never, Rarely, Sometimes, Often, Always”, which allows the influence of individual estimation of what a point of the scale might mean to each person (50% of the cases might mean “often” for one and “sometimes” for other); however, the pre-test showed that for the customer it was more difficult to use the first type of scale than the second one, so we limited its presence in the questionnaire to one question. We can create three categories of reading behaviours based on frequency: frequent readers (those who read the labels in 81%-100% of the cases they buy food), occasional readers (those who read the labels in 21%-80% of the cases they buy food), indifferent readers (those who read the labels in 0%-20% of the cases they buy food). Frequent readers represent a small segment of 7%, while 18% of the sample declared they were “very interested” in the characteristics of their food. The difference may have several reasons: (1) more people declared to care “very much” than the real number (to show a positive image of a interested person); (2) less people declared to read the label (to avoid the image of being too concerned); (3) the estimation “very much” (interested in the characteristics of their food) might not be powerful enough for some of them to trigger the action of getting informed (through reading the label); (4) various factors prevent customers from getting informed: consumers do not perceive reading the label as an action that can help them to have a higher control of what they eat, they cannot read the label (letters are too small, language is not known, label doesn't exist), they do not trust the information on the label, they do not know the information they need is on the label, they do not have the time to read, etc. Studies mention several label attributes that also

influence consumer attention to labels and their reading: display size, colour scheme, familiarity with the label and its location on the front of the pack (Bialkova & van Trijp 2010). Even if health is an important issue for most consumers, efforts to change eating patterns by informing consumers about the link between diet and health is difficult (Grunert & Wills 2007, p. 385) and changing information behavior is also. Various studies concluded that reported consumer use of nutrition labels is high, while the actual use appears to be much lower (Cowburn & Stockley 2005; European Hart Network 2003, apud Grunert & Wills 2007, p.386). Also, often, food choice decisions are low involvement decisions with limited time and effort spent on information processing (van Trijp 2009, p.542). In an ideal situation the share of interested customers should dominate the market. However, there are other studies on students that report even smaller results than those presented here (Chung et al 2010; Ko & Kim 2010).

Indifferent customers represent only 4% of the sample, which is an acceptable figure. Casual customers are the major segment, covering 89% of the sample. Sample structure by age and gender is represented in Figure 1.

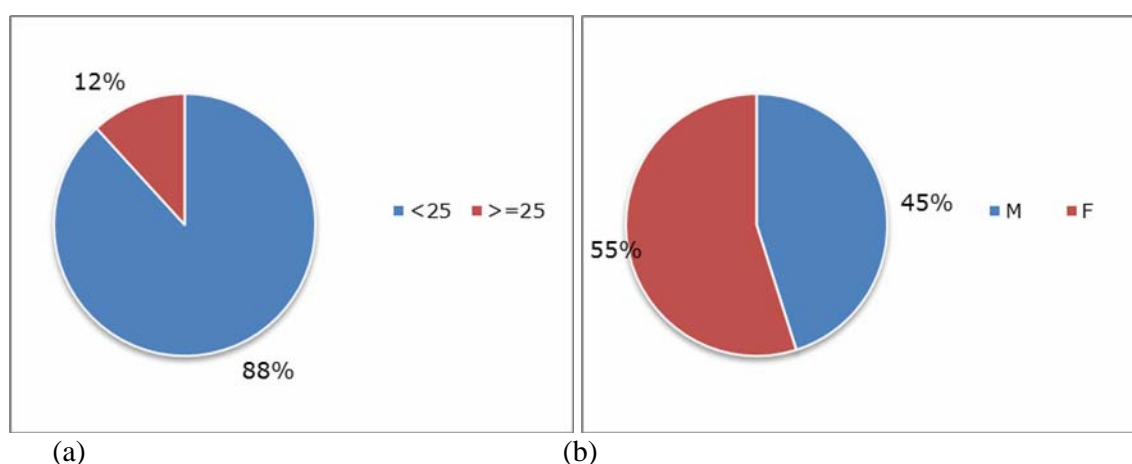


Figure 3. Sample structure by age (a) and gender (b).

We wanted to see if there are statistically significant differences between men and women and between consumers under 25 years old and those above 25 years regarding their level of (self-evaluated) interest in the characteristics of the food they buy.

We run the Mann-Whitney U test to answer the question: (A) "Do men and women differ in terms of level of interest in the characteristics of the food they buy?".

We run the Mann-Whitney U test to answer the question: (B) "Do consumers under 25 years old and those above 25 (inclusive) years differ in terms of level of interest in the characteristics of the food they buy?".

Table 1

Results for Mann-Whitney U test for testing the difference between men and women for level of interest in the characteristics of the food they buy

Test variable	Factor list	p
Interest in the characteristics of the food they buy	(A) Gender	0.954
	(B) Age	0.973

We obtained  $p > 0.05$  for both tests, which means the result is not significant.

There is not a statistically significant difference in terms of level of interest in the characteristics of the food they buy of males (3, (4, 4)) and females (3, (4, 4)).

There is not a statistically significant difference in terms of level of interest in the characteristics of the food they buy of consumer under 25 (4, (3, 4)) and those above 25, inclusive (4, (3, 4)).

Characteristics of segment tested – cultural, economic, personal etc – have an important influence on consumer behaviour, therefore studies results may vary very much, according to them; for instance other research, also on students, but from other culture showed different results, indicating differences in label reading habits according to gender (Li et al 2012; Sharf et al 2012).

We wanted to see if there are statistically significant differences between men and women and between consumers under 25 years old and those above 25 years regarding their (self-evaluated) food label reading frequencies.

We run the Mann-Whitney U test to answer the question: (C) *“Do men and women differ in terms of their food label reading frequencies?”*.

We run the Mann-Whitney U test to answer the question: (D) *“Do consumers under 25 years old and those above 25 (inclusive) years differ in terms of their food label reading frequencies?”*.

Table 2

Results for Mann-Whitney U test for testing the difference between consumers under 25 and those above 25 (inclusive) for label reading frequency

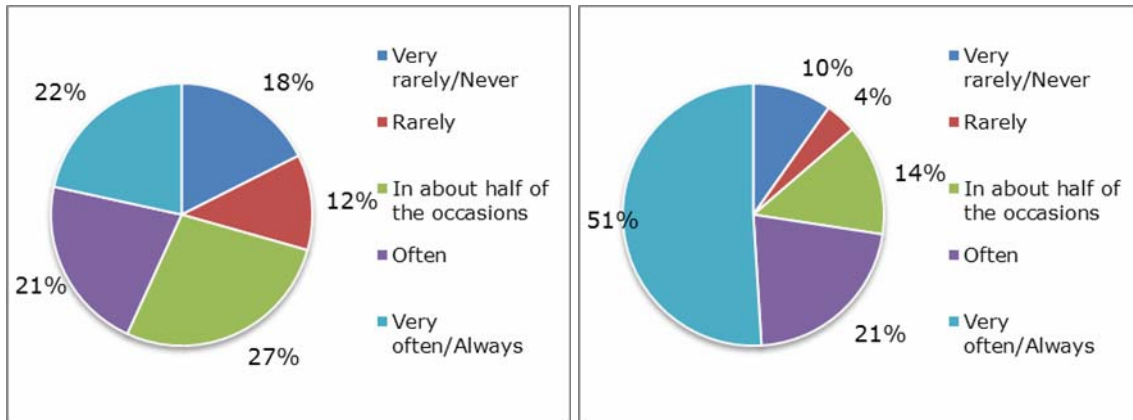
<i>Test variable</i>	Factor list	p
Food label reading frequencies	(C) Gender	0.300
	(D) Age	0.782

We obtained  $p > 0.05$  for both tests, which means the result is not significant.

There is not a statistically significant difference in terms of label reading frequencies of males (3, (4, 4)) and females (3, (3, 4)).

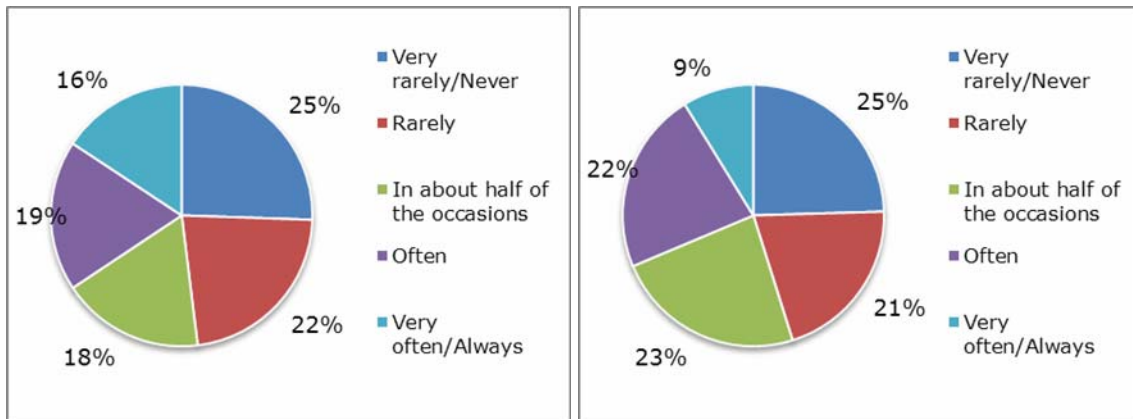
There is not a statistically significant difference in terms of label reading frequencies of consumer under 25 (3, (3, 4)) and those above 25, inclusive (3, (3, 4)).

Food labels provide a wide range of information, which can differ very much in terms of reading frequency. A general assessment of label reading frequency doesn't We created a list with the most common information present on the label and asked the customers to evaluate the frequency with which they read a particular piece of information on the label on a liker scale: Very rarely/Never, Rarely, In about half of the occasions, Often, Very often/Always. The information list contained the following items: Es (food additives); expiration date; energy value (number of calories); all ingredients; only the main ingredients; type of processing (boiled, fried, raw, etc.); country of origin (production); manufacturer's name; importer's name; brand; quantity (pieces, grams, kg); various logos that give specific information (name them); price; nutrition information: carbohydrates, fats, proteins, fibers etc. – *quantity*; nutrition information: carbohydrates, lipids, proteins, fibers etc. – *% of the RDA (recommended daily amount)*; storage conditions; allergens; preparation time (where is the case); other information. We asked: "What type of information have you read on product label or package when you bought food?"



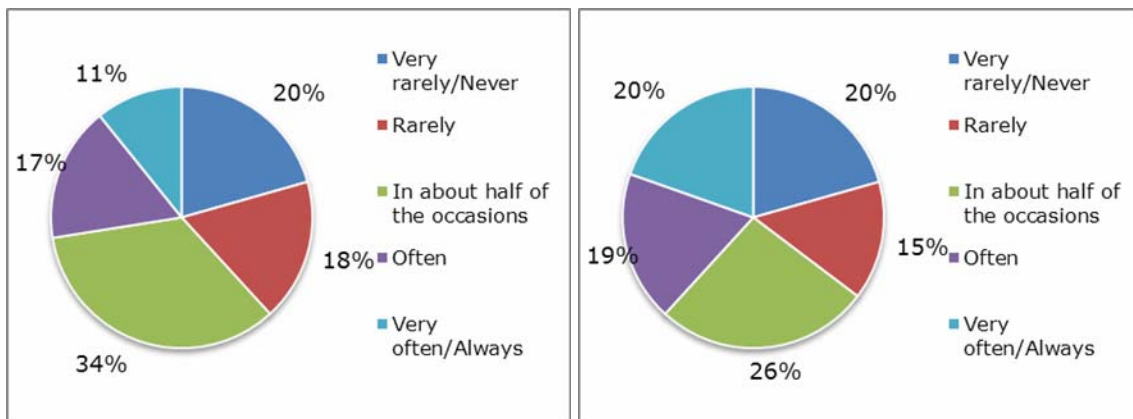
(a) Es (food additives)

(b) expiration date



(c) energy value (number of calories)

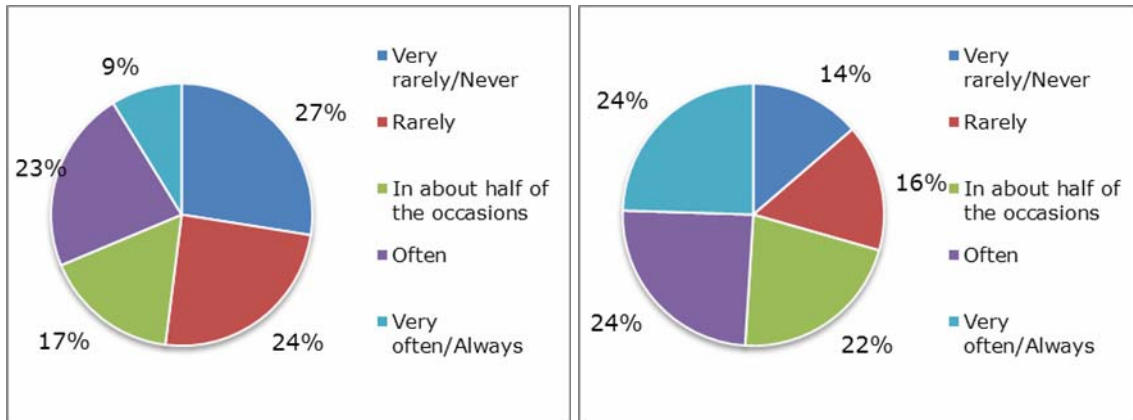
(d) all ingredients



(e) only the main ingredients

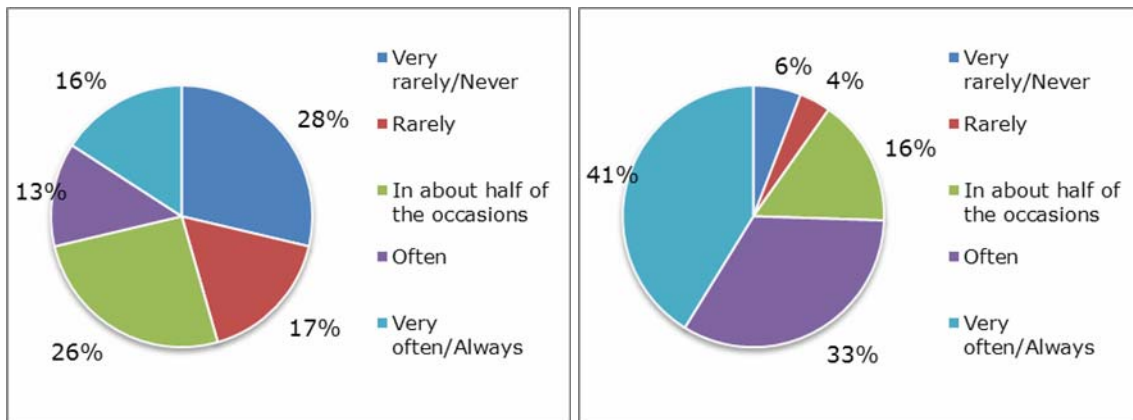
(f) type of processing (boiled, fried, raw, etc)

Figure 4. Self-evaluation of the label reading frequency by items: (a) Es (food additives); (b) expiration date; (c) energy value (number of calories); (d) all ingredients; (e) only the main ingredients; (f) type of processing (boiled, fried, raw, etc.); (g) country of origin (production); (h) manufacturer's name; (i) importer's name; (j) brand; (k) quantity (pieces, grams, kg); (l) various logos that give specific information (name them); (m) price; (n) nutrition information: carbohydrates, fats, proteins, fibers etc. – quantity; (o) nutrition information: carbohydrates, lipids, proteins, fibers etc. – % of the RDA (recommended daily amount); (p) storage conditions; (q) allergens; (r) preparation time (where is the case); (s) other information (source: study data).



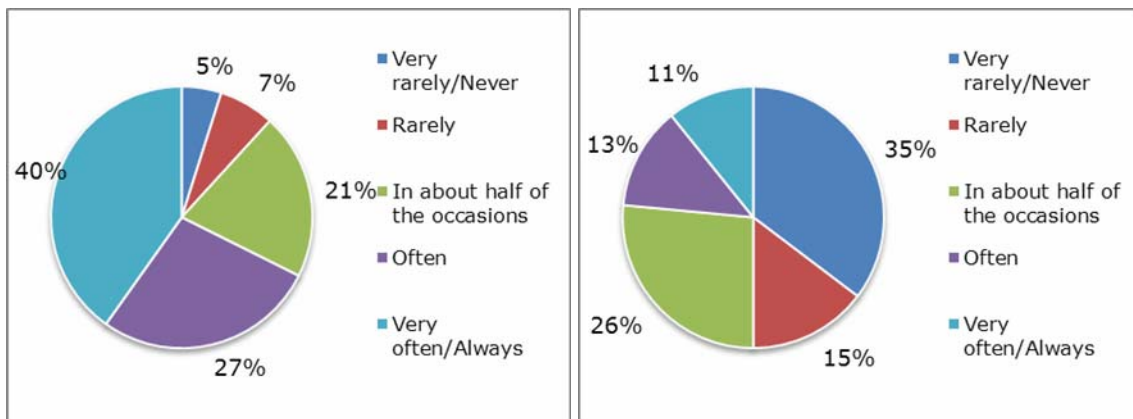
(g) country of origin (production)

(h) manufacturer's name



(i) importer's name

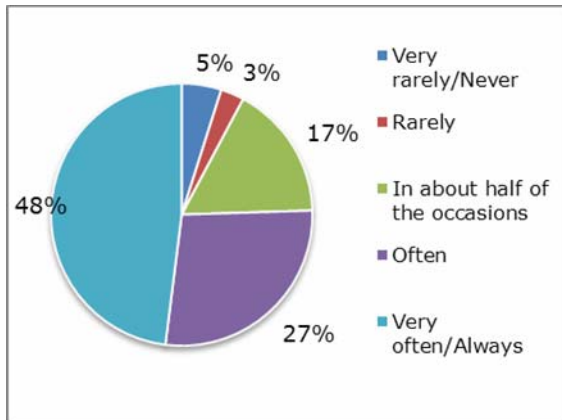
(j) brand



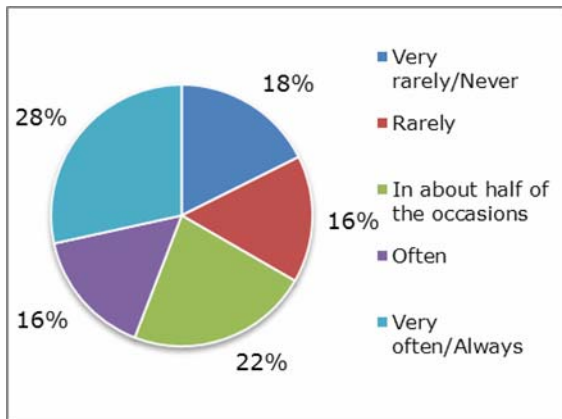
(k) quantity (pieces, grams, kg)

(l) various logos

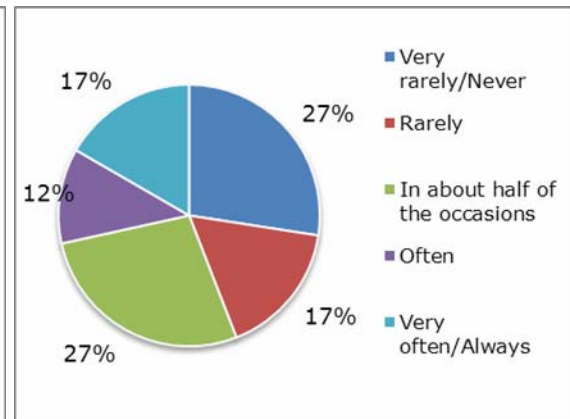
Figure 4 (cont.). Self-evaluation of the label reading frequency by items: (a) Es (food additives); (b) expiration date; (c) energy value (number of calories); (d) all ingredients; (e) only the main ingredients; (f) type of processing (boiled, fried, raw, etc.); (g) country of origin (production); (h) manufacturer's name; (i) importer's name; (j) brand; (k) quantity (pieces, grams, kg); (l) various logos that give specific information (name them); (m) price; (n) nutrition information: carbohydrates, fats, proteins, fibers etc. - *quantity*; (o) nutrition information: carbohydrates, lipids, proteins, fibers etc. - *% of the RDA (recommended daily amount)*; (p) storage conditions; (q) allergens; (r) preparation time (where is the case); (s) other information (source: study data).



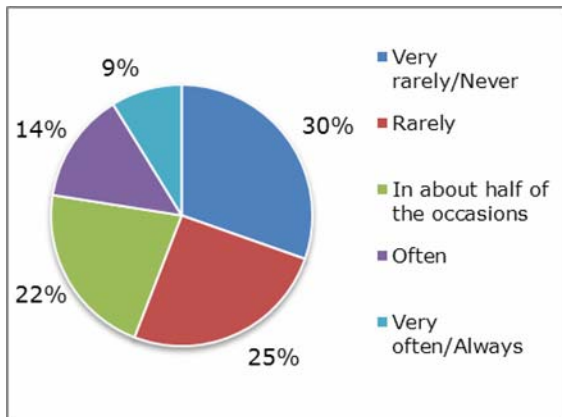
(m) price



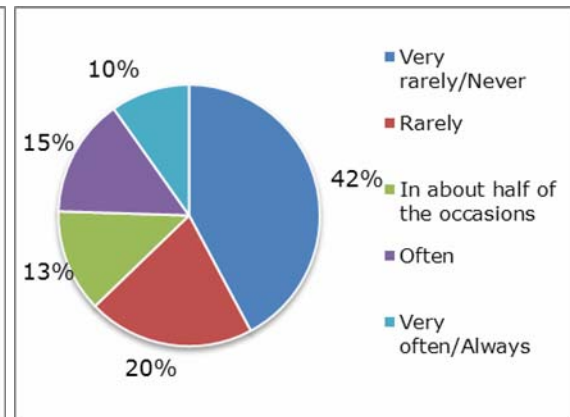
(n) nutrition information – quantities



(o) nutrition information – % of the RDA



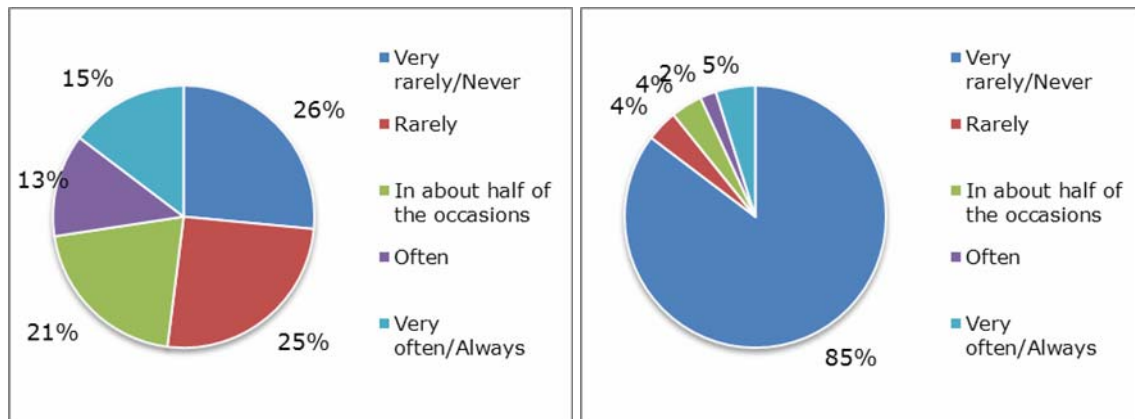
(p) storage conditions



(q) allergens

Figure 4 (cont.). Self-evaluation of the label reading frequency by items: (a) Es (food additives); (b) expiration date; (c) energy value (number of calories); (d) all ingredients; (e) only the main ingredients; (f) type of processing (boiled, fried, raw, etc.); (g) country of origin (production); (h) manufacturer's name; (i) importer's name; (j) brand; (k) quantity (pieces, grams, kg); (l) various logos that give specific information (name them); (m) price; (n) nutrition information: carbohydrates, fats, proteins, fibers etc. – quantity; (o) nutrition information: carbohydrates, lipids, proteins, fibers etc. – % of the RDA (recommended daily amount); (p) storage conditions; (q) allergens; (r) preparation time (where is the case); (s) other information (source: study data).





(r) preparation time (where is the case) (s) other information.

Figure 4 (cont.). Self-evaluation of the label reading frequency by items: (a) Es (food additives); (b) expiration date; (c) energy value (number of calories); (d) all ingredients; (e) only the main ingredients; (f) type of processing (boiled, fried, raw, etc.); (g) country of origin (production); (h) manufacturer's name; (i) importer's name; (j) brand; (k) quantity (pieces, grams, kg); (l) various logos that give specific information (name them); (m) price; (n) nutrition information: carbohydrates, fats, proteins, fibers etc. – *quantity*; (o) nutrition information: carbohydrates, lipids, proteins, fibers etc. – *% of the RDA (recommended daily amount)*; (p) storage conditions; (q) allergens; (r) preparation time (where is the case); (s) other information (source: study data).

The items that are read "Very often/Always" by the highest percentages of the consumers tested are: expiration date (51% of them), brand (41%), quantity (40%), price (48%). At the other end of the scale, the items that are read "Very rarely/Never" by the highest percentages of the consumers tested are: various logos (35%), allergens (42%), other information (85%).

A ranking among tested items can be generated by allocating a score to each item by multiplying the number of persons that gave a certain evaluation by a grade allocated to that evaluation ("Very rarely/Never"=1, ..., "Very often/Always"=5). The resulting scores are shown in Table 1.

Table 3

Scores of reading frequency (score rank from 102 to 510)

<i>Item</i>	<i>Score</i>	<i>Item</i>	<i>Score</i>
(a) Es (food additives)	324	(k) quantity	399
(b) expiration date	408	(l) various logos that give specific information	254
(c) energy value	282	(m) price	421
(d) all ingredients	276	(n) nutrition information – <i>quantity</i>	328
(e) only the main ingredients	285	(o) nutrition information – <i>RDA%</i>	279
(f) type of processing	308	(p) storage conditions	250
(g) country of origin	266	(q) allergens	234
(h) manufacturer's name	337	(r) preparation time	269
(i) importer's name	273	(s) other information	140
(j) brand	408		

Source: study data

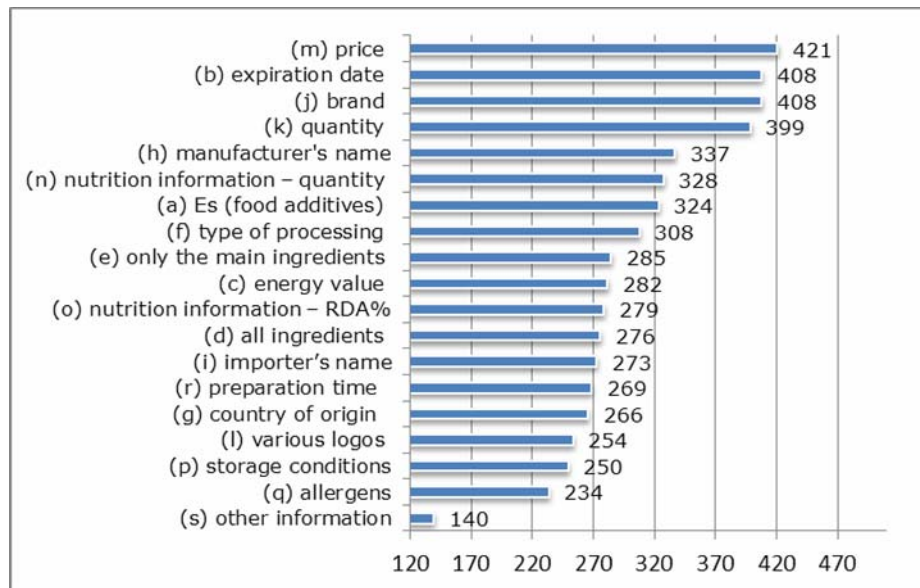


Figure 5. Ranking of reading frequency (scores ranking from 102 to 510), (source: study data).

Based to these scores, we can create three groups of information, according to consumers' reading frequency:

- (1) top interest group includes identification information plus expiration date: price, expiration date, brand and quantity;
- (2) medium interest group is composed by information on nutrition, identification and other attributes: manufacturer's name, nutrition information: carbohydrates, fats, proteins, fibers etc. - *quantity*, Es (food additives), type of processing;
- (3) low interest group includes nutrition information and most of the information of other attributes: only the main ingredients, energy value, nutrition information: carbohydrates, lipids, proteins, fibers etc. - *% of the RDA*, all ingredients, importer's name, preparation time, country of origin, various logos, storage conditions, allergens, other information

We wanted to see if there are statistically significant differences between men and women and between consumers under 25 years old and those above 25 years regarding their reading frequencies of various label information.

We run the Mann-Whitney U test to answer the questions: "*Do men and women differ in terms of their reading frequency of...?*" (see Table 1).

We obtained  $p > 0.05$  in all cases except for two items, which means the result is not significant for all except for the two items mentioned. There is not a statistically significant difference in terms of food label reading frequency of males and females for all information, except for "manufacturer's name" and "other information".

We obtained  $p < 0.05$  for "manufacturer's name" and for "other information", which means the result is significant. There is a statistically significant difference in terms of food label reading frequency of males and females for "manufacturer's name". There is a statistically significant difference in terms of food label reading frequency of males and females for "other information".

Table 4

Results for Mann-Whitney U test for testing the difference between men and women for reading frequency of various label information; percentiles

Information	P	Men			Women		
		percentiles			percentiles		
		25%	50%	75%	25%	50%	75%
(a) Es (food additives)	0.720	2	3	4	2	3	4
(b) expiration date	0.322	3	4	5	4	5	5
(c) energy value	0.604	1.75	2	4	1	3	4
(d) all ingredients	0.553	2	3	4	1	2	4
(e) only the main ingredients	0.562	2	3	3	2	3	4
(f) type of processing	0.069	2	3	3	2	4	4.75
(g) country of origin	0.322	1	3	4	1	2	4
<b>(h) manufacturer's name</b>	<b>0.014</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>2</b>	<b>3</b>	<b>4</b>
(i) importer's name	0.836	1	3	4	1	3	4
(j) brand	0.544	3.75	4	5	3	4	5
(k) quantity	0.131	3	4	5	3	4	5
(l) various logos	0.370	1	3	3.25	1	2	3
(m) price	0.360	3.75	4	5	3.25	5	5
(n) nutrition information - quantity	0.422	2	3	5	2	3	5
(o) nutrition information - RDA%	0.863	1.75	3	4	1	3	4
(p) storage conditions	0.390	1.75	2	3.25	1	2	3
(q) allergens	0.265	1	2	4	1	2	3
(r) preparation time	0.586	1.75	2.50	4	1	2	3.75
<b>(s) other information</b>	<b>0.004</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>

We run the Mann-Whitney U test to answer the question: "Do consumers under 25 and those above 25 (inclusive) differ in terms of their reading frequency of...?".

Table 5

Results for Mann-Whitney U test for testing the difference between consumers under 25 and those above 25 (inclusive) for reading frequency of various label information; percentiles

Information	P	Age < 25			Age ≥ 25		
		percentiles			percentiles		
		25%	50%	75%	25%	50%	75%
(a) Es (food additives)	0.915	2	3	4	3	3	4
(b) expiration date	0.637	3	5	5	1.5	4.5	5
(c) energy value	0.201	1.75	3	4	1	2	3
(d) all ingredients	0.713	1	1.75	3	1.25	3	3
(e) only the main ingredients	0.051	2	3	4	1	2	3
(f) type of processing	0.181	2	3	4	1	2.50	3.75
(g) country of origin	0.536	1	2	4	2	2	4
(h) manufacturer's name	0.325	2	3.5	5	1.25	3	4
(i) importer's name	0.881	1	3	4	1.25	3	3.75
(j) brand	0.338	3	4	5	3.25	4	4.75
(k) quantity	0.935	3	4	5	3	4	5
(l) various logos	0.167	1	2	3	1.25	3	5
(m) price	0.080	4	5	5	2.25	4	4.75
(n) nutrition information - quantity	0.945	2	3	5	2	3.5	4.75
(o) nutrition information - RDA%	0.733	1	3	4	1	3	3.75
(p) storage conditions	0.894	1	2	3	1	2	3.75
(q) allergens	0.765	1	2	4	1	2	3
(r) preparation time	0.469	1.75	2	4	1	2	3.75
<b>(s) other information</b>	<b>0.049</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>3.5</b>

We obtained  $p > 0.05$  in all cases except for one items, which means the result is not significant for all except for the one item mentioned. There is not a statistically significant difference in terms of food label reading frequency of consumers under 25 years old and consumers above 25 (inclusive) for all information, except for "other information".

We obtained  $p < 0.05$  for "other information", which means the result is significant. There is a statistically significant difference in terms of food label reading frequency of consumers under 25 years old and consumers above 25 (inclusive) for "other information".

**Conclusions.** Consumer's opportunities and choices provided by the gain of information, knowledge can be used only if that information and knowledge are taken from the surrounding environment. There are lost opportunities every time a consumer passes by a useful information source without exploring it.

Our study showed consumers' interest in the characteristics of the food they buy is lower than it should be for this segment of young, educated consumers. The reading frequency of food labels is also lower than it would be in an ideal situation for the type of customers studied. We found no statistically significant differences between men and women and between customers under 25 years old and above 25 (inclusive) years for almost all the variables tested.

Around one fifth of sample (18%) declared they were "Very much" interested in the characteristics of the food they bought, while the majority (76%) had "High" and "Average" interest; another 6% declared they cared "a little" or "Very little". A small share (7%) of tested customers declared they read the labels in 81%-100% of the cases they bought food, most of them (89%) read the food labels more rarely, with frequencies ranging between 21%-80% of the cases they bought, and 4% read the labels in 0%-20% of purchasing occasions.

Within the detailed analysis of reading frequency for 19 types of label information, the results showed that the items that are read "Very often/Always" by the highest percentages of the consumers tested were: expiration date (51% of them), brand (41%), quantity (40%), price (48%). At the other end of the scale, the items that were read "Very rarely/Never" by the highest percentages of the consumers tested were: various logos (35%), allergens (42%), other information (85%).

There is not a statistically significant difference between men and women in terms of: level of interest in the characteristics of the food they buy, overall label reading frequencies, reading frequencies for 17 of the 19 information items tested. There is a statistically significant difference between men and women in terms of reading frequencies for "manufacturer's name" and "other information".

There is not a statistically significant difference between consumer under 25 and those above 25 (inclusive) in terms of: level of interest in the characteristics of the food they buy, overall label reading frequencies, reading frequencies for 18 of the 19 information items tested. There is a statistically significant difference between consumer under 25 and those above 25 (inclusive) in terms of reading frequencies for "other information".

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