

**COMPARATIVE ANALYSIS OF BABY FOOD LABELLING IN HUNGARY  
AND IN ROMANIA: CONSUMERS' PERSPECTIVE**Noémi Hajdú<sup>1</sup>, Katalin Lipták<sup>2\*</sup> and Zsuzsa Săplăcan<sup>3</sup><sup>1)2)</sup> *University of Miskolc, Miskolc, Hungary*<sup>3)</sup> *Babes-Bolyai University, Cluj-Napoca, Romania***Please cite this article as:**

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**Abstract**

Baby food represents a growing segment of the food industry; the baby food labelling issues affect more and more mothers who want to make better and safer nutritional choices. In a continuously improving food labelling regulation environment consumer studies regarding the baby food labelling are very limited. Present article has an exploratory nature and aims to find specific patterns of baby food buying behaviour and labelling preference in Romania and Hungary, and also to reveal the behavioural similarities and differences between the two countries. To meet this aim, a questionnaire-based quantitative research was designed. The sample consists of 993 mothers (590 from Hungary and 403 from Romania) with small children. Results show that there is a difference between Romanian and Hungarian mothers regarding the baby food buying habits. The profile of the mothers buying jarred baby food can be characterised by living in towns, with one or two children, and the propensity to give jarred baby food to their child is growing with their age. The mothers agree that the labels contain tiny, unreadable letters, disordered information, unknown expressions and bad translation. The Hungarian mothers pay more attention to the indication of allergen and to the ingredients list. The most important information cluster they seek on a label is related to product ingredients, the second is related to usage of baby food and the least important are the label design elements. The paper provides insightful results for the producers and policy-makers to improve the baby food label quality to help consumers to make better, healthier and safer food choices for their children.

**Keywords:** food labelling, baby food, consumer law.**JEL Classification:** D18, M31.

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\*Corresponding author, **Katalin Lipták** – [liptak.katalin@uni-miskolc.hu](mailto:liptak.katalin@uni-miskolc.hu)

## **Introduction**

Food labels have an important role in consumers' buying decision. They are meant to guide the food choices and the way of consuming the food products. Information provided by food labels has also an important consumer safety aspect. They inform the consumers with various problems and needs about the presence of possible allergens and specific nutrition claims, and about all the important features of the foods having both positive and negative consequences on consumers' health.

Consumer protection and food laws lay down the rights of consumers to safe food and to accurate information. The Hungarian Protection Law (Act CLV. of 1997) declares the five consumer protection principles, from which the two main principles are the most important ones: the protection of the consumers' health and safety; ensure the right of the consumer information. According to the law (2.§) "consumer: is a natural person acting for the purposes of his independent occupation and economic activity who purchases, orders, receives, claims, or the addressee in relating with the commercial communication, offer." In Romania the existing Law 21/1991 regarding the consumer protection (with its subsequent amendments) also relies on five consumer protection principles, two of which are relevant from the aspect of the study: the protection of the consumers' life, health and safety (3. §. a); and the right to the overall and correct information in the interest of suitable decision making of purchase (3. §. a). The general information areas laid down in the consumer protection law are the followings (Government Decree 21/1992, 20. §): product description, product brand, shelf-life, time of use, technical and quality characteristics, composition, use of additives, potential risks, instructions, sipping and storage conditions, prohibitions. In addition, indicating information about the manufacturer or the distributor (name, postal address) is obligatory.

The manufacturer informs the consumers about the composition of the product in the following manner: (1) product label, (2) user and instruction manuals, (3) indicating the consumer price, (4) distinctive signs. The purpose of the information is to provide the appropriate information to the consumer on the use of the goods or the composition of the goods. According to Szűcs (2010) one of the simplest ways of providing information is the use of such a food label which provides not only the quantities but also the quality information to the consumer in an understandable manner. In December 2011, the European Union issued a regulation on food information to a consumer which is valid for the EU Member States (EU Regulation 1169/2011), but for the content of the label from December 2014, so the manufacturers received 3 years of grace period. Accordingly, in order to ensure a high level of health protection for consumers and to ensure their right to information, it is necessary to ensure that they receive adequate information with the foods consumed by them. The regulation strengthened the previous food labelling rules and approved the obligatory indication of the nutritional value from December 2016. Among the basic rules on food labelling, the most important is the description of the food, the presentation of food ingredients, and the quantity of ingredients (e.g. additives, allergenic substances), the expiration date of quality's durability, special storage conditions; the name, postal address of the food producer and the nutritional value (Friedrichné, 2010).

Despite the rigorous regulations system, the European food industry has faced several food fraud cases in recent years. The National Food Chain Safety Office from Hungary and the

National Sanitary Veterinary and Food Safety Authority from Romania are both members of the Administrative Assistance and Cooperation System of the EU dealing with fraudulent practices in the agri-food chain. In 2016 most of the food fraud cases were related to mislabelling issues, mainly to the label non-compliance regarding the food composition (European Commission, 2016).

Baby food represents a growing segment of the food industry. In 2015, Nielsen estimated the baby food global market to \$35 billion. The overall picture shows great differences between countries and regions (Nielsen, 2015). The highly vulnerable consumers of the segments and the mediatisation of food scandals spreading in the last decades impresses its stamp onto the consumer confidence. In the case of baby foods both consumers and authorities and consequently the companies treat with high sensitivity the proper and safe production and marketing processes. One of these tools is the adequate consumer information provided by food labels.

In Romania, the general rules of the labelling of food products are laid down in Government Decree 106/2002 (Ene, 2012). The foods intended for infants and young children are considered as special foods, and their production and marketing conditions are governed by Ministerial Decree 387/2002 (with subsequent amendments). According to it, an infant is a child under 12 months of age and a young child is aged between 1 and 3 years. According to Government Decree 106/2002 and Ministerial Decree 387/2002, the labels of foods for infants and young children shall include the followings: the name of the product, the list of ingredients, the quantity of certain ingredients, the net weight of packaged food, the shelf-life, the conditions of storage and use, the name and address of the producer or distributor, place of origin, instructions for use where relevant, the serial number of the production series (Government Decree 106/2002, 5. §), the food suits a child at what kind of age, presence or absence of gluten, (products intended for infants younger than 6 months of age), energy content, protein-, fat- and carbohydrate content, mineral clay and vitamin content (Ministerial Decree 387/ 2002, 23. §).

In a continuously improving food labelling regulation environment the studies related to the baby food label usage and preference are still very limited. Although the baby food production system is one of the safest in terms of ingredients and production process, an inadequate food labelling system or the low consumer involvement and poor knowledge regarding the label information could put in danger the consumers' health. The absence of the baby food label related consumer behaviour studies is characteristic to the Central and Eastern European countries' literature as well. The aim of this study is to reveal the similarities and differences in baby food buying behaviour and the baby food labelling preference of the mothers in Romania and Hungary. Even though Romania and Hungary are neighbouring countries with similar regulatory conditions, they share different cultural values, eating habits and lifestyles. For a proper and effective food safety information provision by labels, companies and regulatory bodies, among the other factors, should consider the consumer's perception and usage for certain label information. Our findings serve for identifying problems and special patterns of baby food label related behaviour and provide insightful results for the producers and policy-makers to help consumers to make better, healthier and safer food choices for their children.

## **1. Literature review**

### **1.1. The role of the food label in food consumer behaviour models**

According to Lehota (2001) the factors affecting food consumer behaviour, are the followings: economic factors (price, income proportions), biological factors (perception, cognition, illnesses), demographic and social factors (social stratification, family), psychological factors (personality, motivation, attitudes) and cultural factors (traditions). We enumerate among the economic factors primarily the consumers' income, purchasing power and the price of the products. The price of the baby foods we studied is relatively high, so it means a significant cost and burden for families with small children. Regarding the biological factors, the flavour and the composition of baby foods can be decisive for food choice. Food allergy and intolerance, unfortunately, do not spare the babies, so the mothers consciously browse and inform about the ingredients. Demographic structural changes also affect the nation's nutrition. In the case of social factors, we have to mention our days' trend for a healthy and conscious lifestyle, and the consumer demand for it. We follow the reference groups and family traditions in our lives thus they have an impact on our food purchasing habits. Among the psychological factors, the values and attitudes reflecting the healthy lifestyle, occur as a motivating factor in the development of our daily meal. Cultural factors, such as eating habits and traditions fundamentally determine consumer behaviour.

In the literature, the Pilgrim (1957) model is considered to be the first model related to food consumption. The three main pillars of the model consist in food-related, personal-related and economic-social factors. These three dimensions influence the consumer in his decision making concerning food shopping. At the food level, the characteristics of the nutrients and their physiological effects prevail. Among the consumers' psychological factors should be mentioned the current mood, previous experience, or the personal preference system. For economic-social factors, the product's price, the brand and the availability are also influencing factors. Lehota (2001) and Szakály (2011) reveal the deficiency of the model that the interactions between the factors are not fully covered. Shepherd (1990) developed the Pilgrim model which, according to Brávác (2015), differs from the original model in some point. For example, it "emphasizes the food characteristics, details the person-related factors and storing the environmental factors into a group".

The consumers' food label usage and preference are consequences of a series of product, personal and socio-economic factors. According to Miller and Cassady (2015) nutrition knowledge can support the use of information on food labels at least in three ways: (1) preliminary knowledge allows for the consumers to pay attention to the important information on the label and ignore marketing features, (2) previous nutritional knowledge helps to understand the data on the label, (3) previous nutrition knowledge encourages the use of information in food choice.

Kempen et al. (2011) has revealed in the course of his qualitative research that the consumers use the labels to assess of the nutritional values, personal benefits, health features and the quality of food products. The food choice cannot longer be regarded as a low-risk, routine shopping, rather a high degree of involvement, a rational choice (Schiffman and Kanuk, 2010). Health conscious consumers are increasingly characterized by the fact that they buy products that meet specific nutritional needs against mass products (Panyor, 2007). The concept of the strategic foods, which Szente, Széles and Szakály

(2006) describes by three characteristics: they carry nutritional marketing features, they have distinct marketing features, the annual growth in their consumption significantly exceeds the traditional foods.

Based on these special requirements, Szente, Széles and Szakály (2006) define three categories of foods: functional foods, organic foods, local and regional food. In the case of baby foods, the first two categories are relevant, therefore we examine them further. Piskóti, Nagy and Kovács (2006) have understood under the functional foods that have a beneficial effect on health and well-being. The concept was described with the following criteria: "It provides energy, contains vitamins, naturally cures, strengthens the immune system, it has a positive effect on digestion – brings into balance, heart healthy, stress relieving, effects helping in sleeping (relaxation), strengthens bones and cartilages, retard the aging process. Nagy (2010) draws attention to the role of mothers in the case of functional foods, who teach their children from their birth how they may live and eat healthily." We consider those vegetable or animal origin foods to organic food which produced, processed or imported under the statutory requirements of organic production and under the control of a recognized inspection body" (Maczák et al., 2011). According to the conceptual framework of consumers' pre-purchase satisfaction with food labels developed by van Der Colff et al. (2016), the consumers examine the following information on the food labels: expiry date, ingredient list, nutrition/health information, country of origin/geographical region, allergen information, well-known logos/symbols, name of manufacturer, quality guarantee, usage instruction.

## **1.2. Food labelling and searching of the label information**

In 2011, the European Union created a new law on food labelling (1169/2011) and the main aim of it was the consumers' overall information. There is an increasing number of obese or diabetes people due to the consumption of excessive sugar, salt, fat and saturated fat (Gittelsohn et al., 2013). According to Gyrd-Hansen and Kjaer (2015) because of the health costs and reduced productivity of the obese people, it can lead to a negative externality and to the bankruptcy of the healthcare system (Cawley and Meyerhoefer, 2012; Mora et al., 2015; Cavaliere, De Marchi and Banterle, 2017). Miller and Cassady (2015) reviewed the labelling information of foods and grouped them into three categories: nutrition labels, ingredient lists and claims. On the food packaging, different forms of the point of choice information are applied, such as nutritional data (WHO, 2013) and the calorie content (Kiszko, et al., 2014). However, this complex information means a challenge to the consumer in the selection of healthy foods (Nelson et al., 2014; Zepeda et al., 2013). In recent years there has been a growing demand for foods that are rich in natural ingredients (Cheung et al., 2015). Consumers believe that products with natural ingredients without additives are healthier (Dickson-Spillman et al., 2011). Some ingredients are identified with "E" numbers in the European Union (EFSA – European Food Safety Authority), but according to Hoogenkamp (2012) the consumers consider them harmful and unhealthy.

Is this enough to reform our lifestyle and consumer behaviour? The answer is not clear. According to Ollberding, Wolf and Contento (2010), the labelling of the foods itself is not enough to effectively change the behaviour of the people, but dieticians can use it as a motivating tool for preventing and treating obesity and dietary chronic illnesses. Pettigrew et al. (2017) draws attention to the nutrition value at the front of the pack and to the novelty of the front-of-pack labels (FoPLs). Tarabella and Voinea (2013) pointed that an optimal

front-of-pack food label adapted to consumers' needs should not require high cognitive effort from behalf of the consumer and should be easy to use in a purchase context.

According to Loureiro, Yen and Nayga (2012) there is a correlation between the nutritional labels and the measure of decreasing obesity, particularly in the case of women. In a study conducted in Romania Zugravu et al. (2011) found, that 81,1 % of the respondents regularly check the food labels. This behaviour is characteristic to middle-aged woman, living in a couple in big towns, and having a greater preoccupation regarding body weight. The most important information are the nutritional facts and health claims, 49,2 % of the respondents choose them, the rest of the respondents are interested just in the "best before" information.

For mothers with small children how important is the health issue in the choice of the baby food? In our research we also discuss it. Bandara et al. (2016), in their research, have proven that most of the consumers tend to look at labels during their shopping, where primarily the name of the product, the food safety, the nature of conservation, food origin and the reputation of the brand are important. In the case of a development of a special nutritional diet – e.g. food allergy, eating without meat, religious reasons, consciousness (organic foods) – product information can be found from the description on the back of the product, from the QR code, and with the usage of applications. However, such shopping situations may occur when we do not have a look at the label, for example in the case of brand loyalty or routine shopping. The label has a significant influence on the selection of foods. The question arises as what kind of a good label is, what it does contain, what colour it could be, what kind of letter type and highlighting would the information be written. Of course, the designing of the label the primary aspect is the legal requirement of a country which is uniform in the member states of the European Union. In a study that investigates different food-label schemes in Spain. Gracia and de-Magistris (2016) found that consumers valued labelling schemes that are regulated by European Union law. But the consumer preferences for food labelling is not homogenous, they delimited three consumer segments based on preferences: Protected Destination of Origin lovers, organic EU logo lovers and nutritional information lovers (Gracia and de-Magistris, 2016). In a food-label related study undertaken in South Africa by van der Colff et al. (2016) the primary information searched by consumers on a food label are the expiry date, information about allergens, nutrition/health information, ingredient list and quality guarantee, while the secondary information are related to usage instructions, name of the manufacturer, well-known logos/symbols, number of servings and the country of origin or the geographical region. On average, consumers were dissatisfied with the primary information and more satisfied with the secondary information on food-labels. They also found that in case of the consumers who are satisfied with food labels, the likelihood to choose a food product over another is high (van der Colff et al., 2016).

The most important tool for communicating food information is the content on the label. According to Dörnyei et al. (2014), the degree of how much the consumers are watching the labels depends on the following factors: general individual features (health – conscious, existing illnesses, gender, qualification, income, lifestyle), individual features related to product category (tiding to a product category, confidence), and the individual factors being attached to the label (attitude, the ability of data processing). In their later research, Dörnyei and Gyulavári (2016) propose a detailed model of the factors influencing the search of label information. Based on a detailed literature review and a netnographic study, they developed

the main factors of label information search (figure no. 1), such as general personal factors (e.g. health consciousness and socio-demographics), label-related personal factors (e.g. label-related self-efficacy, trust in labels and the perceived usefulness of labels) and product category-related personal factors (Dörnyei and Gyulavári, 2016). This model is relevant for our study in operationalising our variables. Several studies found differences between countries in food label usage and information preference, indicating that different cultures, traditions, and eating habits could influence the consumers' preference for food, food labels in general, and the usage of some specific label information, in particular (Saba et al., 2010; Grunert et al., 2010). While Hungary and Romania are neighbouring countries, and both are members of the European Union, which means common food labelling regulation, the cultural values they share and the eating habits they practice are quite different. In our research we investigate if there are differences in baby food buying habits between Romanian and Hungarian mothers, and how their attitudes, perceptions, usage behaviour and information preferences regarding the baby food labels look like?

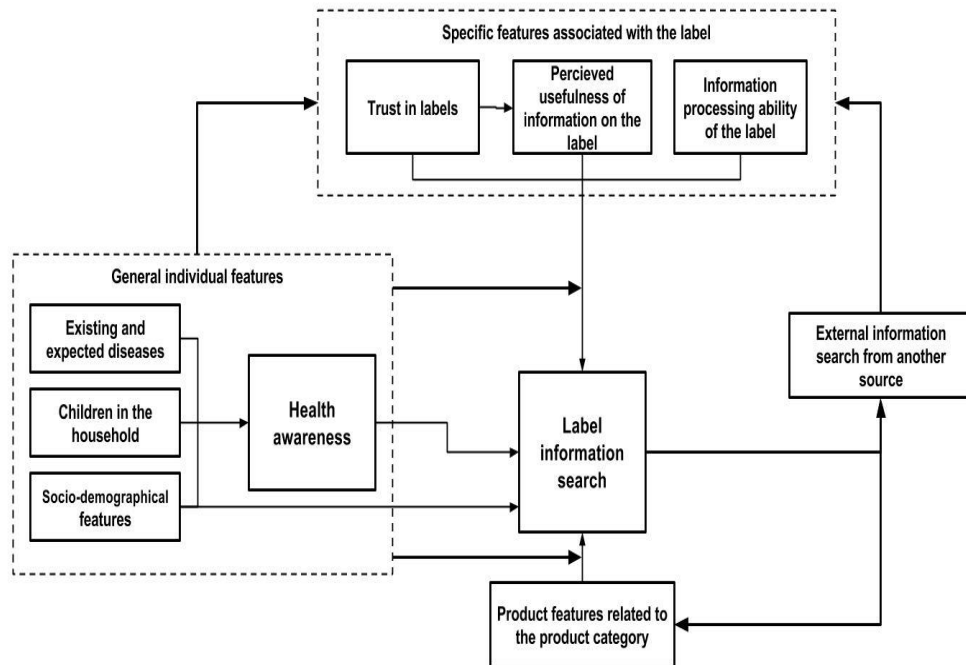


Figure no. 1: Label information search (LIS) model

Source: Dörnyei and Gyulavári, 2016

## 2. Research questions and methodology

### 2.1. Research questions

Consumer studies on baby food have been very limited, only a few studies have investigated the behaviour patterns of the baby food choice and baby food labelling preference patterns. Peterson and Li (2011) identified in United States a strong consumer preference for the dominant baby food brands against the niche suppliers. They also

highlighted the preference for domestically grown ingredients. The present study focuses on jarred ready-made baby food products.

Since baby food label related consumer studies are very limited, present study has an exploratory nature in order to find specific patterns of baby food buying behaviour, the baby food labelling preference and label reading behaviour in general, and eventually differences in this behaviour of the mothers from Romania and Hungary in a similar EU regulation context, given the findings of other authors regarding cultural differences in food label reading habit (Saba et al., 2010; Grunert et al., 2010). Thus, we formulated six research questions as follows:

RQ1: Is there a difference between Romania and Hungary regarding baby food choice?

RQ2: Which are the demographic determinants of the baby food choice?

RQ3: Which are the motivations of the baby food choice? Is there a difference in motivation between Hungary and Romania?

RQ4: Which are the main problems regarding baby food labelling? Are these problems country-specific?

RQ5: Which are the most frequently searched information on a baby food label? Are these information preferences country-specific?

RQ6: Can be delimited main information clusters based on consumers label reading behaviour? (primary-secondary-tertiary label information).

## **2.2. Methodology**

In order to answer our research questions, we carried out a primary research in Hungary and in Romania based on questionnaire. The survey used a self-filled, electronic questionnaire in Hungarian and Romanian language, in mirror translation. The data collection was done by the help of the Google Form; for data analysis the IBM SPSS Statistics Version 24 were used. The questionnaire examined the purchasing habits of ready-made baby food among the Hungarian and Romanian mothers with small children, as well as the labelling characteristics of baby foods from the mothers' perspective. The data collection phase of the research took place in August and September 2017, with a snowball method by targeting specified Facebook groups both in Hungary and Romania.

The questionnaire consists of 22 questions grouped into five sections as follows: 1. Questions regarding the number, age and the feeding style of the babies in the household (measured by nominal scales); 2. general consumer behaviour questions regarding the choice and the consumption patterns of jarred baby food (nominal and Likert scale questions); 3. the motives of non-consumption where it was applicable; 4. Questions are regarding the label information search, use and interpretation behaviour (measured by Likert scales) and socio-demographics (age, marital status, education, residence).

The RQ1 and RQ2 were investigated using chi-square test based on cross tabulations. In order to measure jarred baby food buying motivation for RQ3, we used five-point Likert scales. The statements were developed based on previous interviews. ANOVA test were used to reveal differences in motivation in the two studied countries. The main problem identified by consumers regarding baby food labels for RQ4 were measured by five-point Likert scales, and the country differences were tested by ANOVA test. The statements were



(1) tiny, unreadable letters, (2) disordered information, (3) unknown expressions, (4) bad translation, (5) pictograms cannot be understood, (6) damaged labels measuring, and were adopted from van der Colff et al. (2016) and from Dörnyei and Gylavári (2016). For RQ5 the main information searched by mothers were measured by Likert scales too, the information clues were adopted from van der Colff et al. (2016) and from the legal requirements of the baby food labels. The country-specific differences were researched by ANOVA test. Based on the main information searched by mothers on the baby food labels, we performed an exploratory factor analysis in order to delimit the main information categories and to answer RQ6. Based on the research of van der Colff et al. (2016), we expected at least two main clusters of information: (1) primary information which are the expiry date, information about allergens, nutrition/health information, an ingredient list, quality guarantee and (2) secondary information which are the usage instructions, the name of the manufacturer, well-known logos/symbols, number of servings, the country of origin/geographical region.

**2.3. The sample**

After the cleaning and checking of the data, a subsample of 590 responses was available for the Hungarian mothers with permanent residence, and a subsample of 403 responses were from the Romanian mothers with permanent residence. Thus, the total number of the samples is of 993 people (table no. 1). The representativeness of the sample was checked on the basis of the distribution of the residence, the age and the qualification. During the filling, we omitted 5 responses from the Hungarian sample as the mothers' permanent residence was neither Hungary nor Romania (the target area of the research was these two countries) we took out 5 more responses from the sample because they were incomplete. 69 questionnaires were taken out from the Romanian answers, as the mothers permanent residence were outside Romania.

**Table no. 1: The demographic distribution of the sample (N=993)**

		<b>Frequency</b>	<b>Percent</b>
<b>Country</b>	<b>Hungary</b>	590	59,4
	<b>Romania</b>	403	40,6
<b>Age</b>	<b>20-24</b>	181	18,2
	<b>25-29</b>	292	29,4
	<b>30-34</b>	355	35,8
	<b>35-39</b>	130	13,1
	<b>40-44</b>	31	3,1
	<b>45-</b>	4	0,4
<b>Marital status</b>	<b>Married</b>	716	72,1
	<b>Live with partner</b>	260	26,2
	<b>Divorced</b>	17	1,7
<b>Educational attainment</b>	<b>Primary school</b>	32	3,2
	<b>Secondary school</b>	158	15,9
	<b>High school graduation</b>	301	30,3
	<b>University degree or higher</b>	502	50,6
<b>Permanent residence</b>	<b>Small village</b>	252	25,4
	<b>Other city</b>	299	30,1
	<b>Capital town of county</b>	314	31,6
	<b>Capital town</b>	128	12,9

### 3. Results and Discussion

#### 3.1. Demographic determinants of baby food choice

We examined the link between the permanent residence and the purchase of ready-made baby food. According to the null hypothesis there is no correlation between the country and the buying of baby food. We examined the null hypothesis with cross-panel analysis and Khi-square. The 88,6% of the Hungarian mothers give baby food to their children, 11,4% of mothers in Romania give ready-made baby food to their babies (table no. 2). According to the sample 66,3% of the mothers give ready-made baby food to their child. Based on the columns variable, 79,5% of the mothers have permanent residence in Hungary; 20% them with Romanian residence.

**Table no. 2: Crosstabulation of the country and baby food consumption**

			Have you given jarred baby food to your child?		Total
			Yes	No	
Country	HU	Count	523	67	590
		% within Country	88,6%	11,4%	100,0%
		% within Respondents	79,5%	20,0%	59,4%
		% of Total	52,7%	6,7%	59,4%
	RO	Count	135	268	403
		% within Country	33,5%	66,5%	100,0%
		% within Respondents	20,5%	80,0%	40,6%
		% of Total	13,6%	27,0%	40,6%
Total	Count	658	335	993	
	% within Country	66,3%	33,7%	100,0%	
	% within Respondents	100,0%	100,0%	100,0%	
	% of Total	66,3%	33,7%	100,0%	

The answer to the correlation between the two variables is given by the value of the Pearson's Khi-square. The observed value of the indicator is 325,726 which also exceeds the 0,05-threshold value on 0 significance level, so the null hypothesis was rejected, thus there is a significant context between the mothers' home and the purchase of the ready-made baby food. We examined the values of Lambda, Goodman and Kruskal tau and the Uncertainty Coefficient and they indicate the decrease of error probability estimation. The knowledge of our country improves our baby food purchase estimates with 49,9% according to the Lambda; 32,8% according to Goodman and Kruskal tau; 25,2% according to the Uncertainty Coefficient. This means that the country seems to be an excellent prediction variable regards the baby food purchases. The significance level is always zero.

Between the two variables there is a little stronger significant (Phi value 0,573; the V value of Cramer 0,573). So, there is a significant context between the mothers' home and the purchase of baby food, where the Hungarian mothers rather give ready-made baby food to their child than the Romanian mothers (Khi-square= 325,726; df=1; p=0,0).

The geographical deviation is very surprising between the purchase of ready-made baby foods, in Hungary mothers buy more ready-made baby food than in Romania. Nowadays, a mother needs to be fit in several areas, ready-made baby foods can provide not only the baby's healthy, varied nutrition but also save valuable family time (Tausz, 2014). Nursing mothers who do not give ready-made baby food to their children were asked why they do

not give ready-made baby food to their children. By grouping the answers, the following reasons were mentioned: they trust more about the food prepared by themselves; they are distrusted by the quality of the ready-made products available in the shop; mothers tried to give them to their children, but they did not like them; they thought that the ready-made baby foods are very expensive; they do not buy it because of additives. Among the Romanian mothers, two types of responses are the most common cause of non-consumption: it is not necessarily a negative perception about the jarred baby foods (not healthy, contains additives, contains preservative, they do not trust it, not fresh, not delicious).

468 mothers (47,1%) started the nourishing at the age of the babies' 3-5 months (of which 91 people are Romanian), 514 people (51,8%) started the nourishing at the age of the babies' 6-8 monthly age (of which 303 people are Romanian); 5 people (0,5%) started the nourishing at the age of the babies' 9-11 months (of which 3 people are Romanian). Mothers in Hungary buy the following buy the following brands of ready-made baby foods (several brands could be marked): Kecskeméti (382 people), Univer (352 people), Hipp (337 people), Hamanek (190 people), DM own brand (185 people), Babydream (177 people), Rossmann own brand (151 people). Mums in Romania buy the following brands of ready-made baby foods (several brands could be marked): Hipp (99 people), Humana (39 people), Organix (27 people), DM own brand (27 people), Plasmon (17 people) and 12 other brands with some mentions (NaturNes, Holle, HeroBaby, Hamanek, Kecskeméti).

50 mothers give their children more jarred ready-made baby foods daily (of which 2 people are Romanian), 106 mothers give one jarred ready-made baby food to their children a day (of which 8 people are Romanian), 176 mothers give several times a week (of which 11 people are Romanian), 123 mothers give once a week (of which 13 people are Romanian), 59 mothers give ready-made baby food to their children once in a month (of which 9 people are Romanian), 144 mothers still rarely give this (of which 92 people are Romanian), 335 mothers never give ready-made baby food to their children.

Answering to the RQ1, there definitely is a difference between Romanian and Hungarian mothers regarding the baby food buying habits. In Hungary the percentage of mothers who give jarred ready-made baby food to their child and the frequency of the baby food intake is significantly higher.

According to the number of children; in the sample one mother has got 6 children; 2 mothers have got 5 children; 5 mothers have got 4 children; 45 mothers have got 3 children; 235 mothers have got 2 children and 1 child of 705 mothers. Of the mothers with one child, 238 people do not give ready-made baby foods to their child (of which 189 people are Romanian), 466 people give it (of which 90 Romanian). Of the mothers with two children 85 people do not give ready-made baby foods to their child (of which 71 people are Romanian), 150 people give it (of which 40 people are Romanian). Of the mothers with 3 children 8 people do not give ready-made baby foods to their children (of which 5 people are Romanian), 37 people give it (of which 5 people are Romanian). Altogether 335 mothers do not give jarred ready-made baby foods to their children (of which 268 people are Romanian) and 685 mothers give them (of which 135 people are Romanian).

We were curious about what kind of a context there is between the type of the settlement and the purchase of ready-made baby food. According to the null hypothesis there is no correlation between the type of the settlement and the purchase of the baby food.

We examined the null hypothesis with cross-panel analysis and Khi-square. We supposed that people living in the villages do not give ready-made baby food to their child bought in a shop, because they produce themselves the fruits and vegetables in their gardens and we expected that they prepare their own baby food. In the sample the 52% of people living in the villages give ready-made baby food which can be bought in a shop, 48% do not give; 73,6% of people living in other towns give ready-made baby food, 26,4% do not give; 66,2% of those who live in the country seat give ready-made baby food, 33,8% do not give; 77,3% of those who live in the capital give ready-made baby food, and 22,7% do not give (table no. 3).

**Table no. 3: Crosstabulation of the residence and baby food consumption**

			Have you given jarred baby food to your child?		
			Yes	No	Total
Type of the Residence	Small willage	Count	131	121	252
		% within Residence	52,00%	48,00%	100,00%
		% within Respondents	19,90%	36,10%	25,40%
		% of Total	13,20%	12,20%	25,40%
	Other town	Count	220	79	299
		% within Residence	73,60%	26,40%	100,00%
		% within Respondents	33,40%	23,60%	30,10%
		% of Total	22,20%	8,00%	30,10%
	Capital town of county	Count	208	106	314
		% within Residence	66,20%	33,80%	100,00%
		% within Respondents	31,60%	31,60%	31,60%
		% of Total	20,90%	10,70%	31,60%
	Capital town	Count	99	29	128
		% within Residence	77,30%	22,70%	100,00%
		% within Respondents	15,00%	8,70%	12,90%
		% of Total	10,00%	2,90%	12,90%
Total	Count	658	335	993	
	% within Residence	66,30%	33,70%	100,00%	
	% within Respondents	100,00%	100,00%	100,00%	
	% of Total	66,30%	33,70%	100,00%	

The answer to the correlation between the two variables is given by the value of Pearson's Khi-square. The observed value of the indicator is 37,172 (d=3), which also exceeds the 0,05 threshold value on 0 significance level, so the null hypothesis was rejected. So, there is a significant level context between the type of the settlement and the purchase of ready-made baby food. We also examined the values of Lambda, Goodman and Kruskal tau and the Uncertainty Coefficient. The Lambda is not significant (0,291). There is a weak significant contact (the value of Phi 0,193; the value of Cramer 0,193) and the predictive ability of the independent variable (settlement type) is very low, that is probable that other variables also play a role when purchasing ready-made baby food.

It was worth to consider examining the relationship between the mothers' age and the purchase of ready-made baby food in shop using the above-mentioned method. The value of the Pearson Khi-square is 25,366 (df=5) which exceed the 0,05 threshold value on 0

significance level, thus the null hypothesis was rejected; so there is a significant level context between the mothers' age and the purchase of ready-made baby food, but the context was weak (the value of Phi 0,160). We got interesting results when we look at each age, 58% of the mothers between 20 and 24-year-old buy ready-made baby food, 42% do not give; 63,4% mothers between 25 and 29-year-old give ready-made baby food; 65,9% of the mothers between 30 and 34-year-old give ready-made baby food to their child. The 80,8% of the mothers between 35 and 39 years old give jarred baby food, the 87,1% of the mothers between 30 and 34-year-old give ready-made baby food to their child. It can be concluded that the elder mothers pay attention to the ready-made baby food, presumably the aged mothers with more children than with one and thus they choose the time-saving and more comfortable choices due to the lack of available leisure time.

Thus, the profile of the mothers (RQ2) buying jarred baby food for their child can be characterised by living in towns, capital or other, with one or two children, and the propensity to give jarred baby food to their child is growing with their age.

**3.2. Baby food choice and label preference differences between Hungary and Romania**

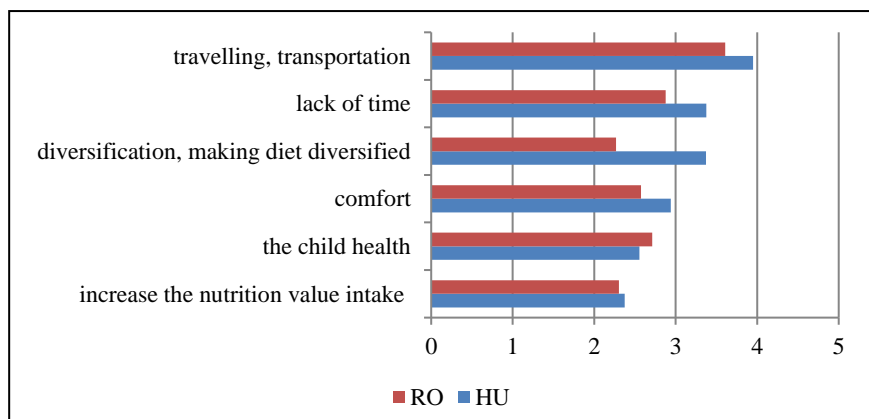
We were curious about whether there is a link between the permanent residence of mothers (country) and the decision-making aspects of buying baby food. To do this, mothers had to evaluate the following aspects in a scale of 1 to 5 (the question of the questionnaire: why did you decide to buy ready-made baby food?): 1. increase the nutritive value, 2. the health of the child, 3. lack of time, 4. comfort, 5. travelling, transportation, 6. make diet varied. We marked the countries as independent variables (Hungary and Romania), we gave the decision-making aspects of buying food as dependent variable. We have found the analysis of variance (analysis of variance, ANOVA) the suitable from the statistics methods which examines one or more independent variables on one or more dependent variables. The conditions of the using of variance analysis are that the dependent variable be with a normal distribution and the variance homogeneity (standard deviations homogeneity). Both criteria were met in the sample, so we continued the analysis. We got the following significance level per criterion (table no.4): the increase of the taken nutritive value and the health of the child have not influence strength at the decision-making of purchase. The other factors are yes as their significance level is less than 0,05. The eta values show the strength or weakness diet diversified, which is also show a weak contact.

**Table no. 4: ANOVA test of baby food choice motivation**

		Sum of Squares	df	Mean Square	F	Sig.
<b>Increase the nutrition value intake</b>	<b>Between Groups</b>	0,516	1	0,516	0,275	0,600
	<b>Within Groups</b>	1199,515	639	1,877		
	<b>Total</b>	1200,031	640			
<b>The child health</b>	<b>Between Groups</b>	2,481	1	2,481	1,163	0,281
	<b>Within Groups</b>	1367,650	641	2,134		
	<b>Total</b>	1370,131	642			
<b>Lack of time</b>	<b>Between Groups</b>	24,758	1	24,758	11,971	0,001
	<b>Within Groups</b>	1331,966	644	2,068		
	<b>Total</b>	1356,724	645			
<b>Comfort</b>	<b>Between Groups</b>	13,055	1	13,055	6,347	0,012
	<b>Within Groups</b>	1318,488	641	2,057		

		Sum of Squares	df	Mean Square	F	Sig.
	<b>Total</b>	1331,543	642			
<b>Travelling, transportation</b>	<b>Between Groups</b>	11,957	1	11,957	6,479	0,011
	<b>Within Groups</b>	1195,921	648	1,846		
	<b>Total</b>	1207,878	649			
<b>Diversification, making diet diversified</b>	<b>Between Groups</b>	119,242	1	119,242	33,937	0,000
	<b>Within Groups</b>	2245,229	639	3,514		
	<b>Total</b>	2364,471	640			

The regional differences are outlined nicely, as the lack of time in Hungarian mothers' responses received averagely 3, 377 points, 2,788 in Romanian mothers' answers (figure no. 2). Comfort is also such a factor, the Hungarian mothers have set an average value of 2,941, which in Romanian mothers' answer was 2,575. The making diet diversified in Hungarian mothers' responses got 3,372 average points and it got 2,267 points from the Romanian mothers. There was not a considerable difference at the other factors as the reason influencing the Hungarian and Romanian's mothers' purchase decisions (RQ3).



**Figure no. 2: Mean value differences of baby food choice motivation**

We examined the relationship between the aspects of buying baby food and the mothers' regional affiliation with ANOVA test. The package, the design and the free from artificial food colouring, the brand and the information on the label do not have any influence strength on mothers (figure no. 3). The compound of the product, its price, its taste, organic ingredients, free from added chemical impurities and the packing have influence strength (these significance level is smaller than 0,05). The eta values were very low, from the listed factors at the price of the product was the highest value (0, 124), but it also indicates a weak connection.

We also investigated the consumers' general food label attitudes. There is no significant difference between Hungarian and Romania mothers regarding the statement, that food labels are important tools in fraud prevention (0,666 significance level) but they equally consider, that the labels provide too much information (0,138 significance level). Both the Hungarian and Romanian mothers gave the highest evaluation to the statement "the labels provide useful information". The only difference discovered between the two countries was

found in the perception of easiness to understand the label information. Romanian consumers showed higher perceived difficulties to understand label information.

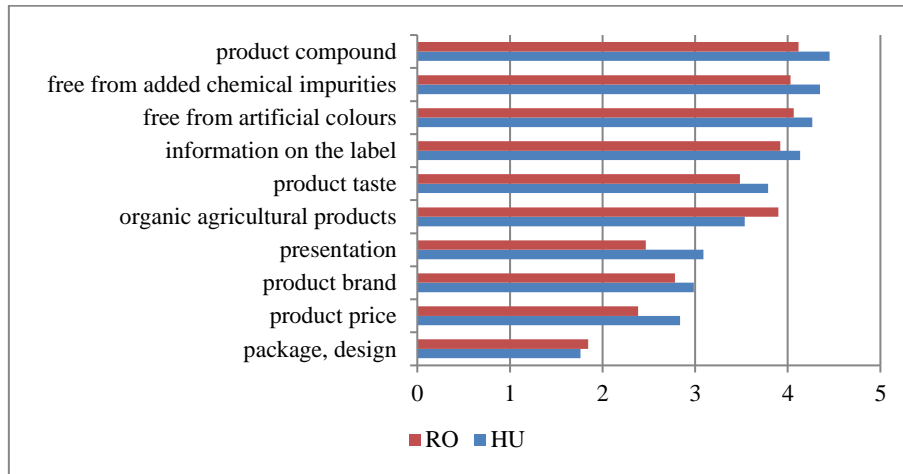


Figure no. 3: Mean values of the baby food attribute importance

We asked what problems can arise with the labelling of ready-made baby foods. We examined it with ANOVA test, the entire criterion has influencing strength. At the same time the eta values are very low here, but the criterion of unknown expressions has medium eta value. The mothers gave very low average points to the criterions and no major differences could be discovered between the countries (figure no. 4) (RQ4).

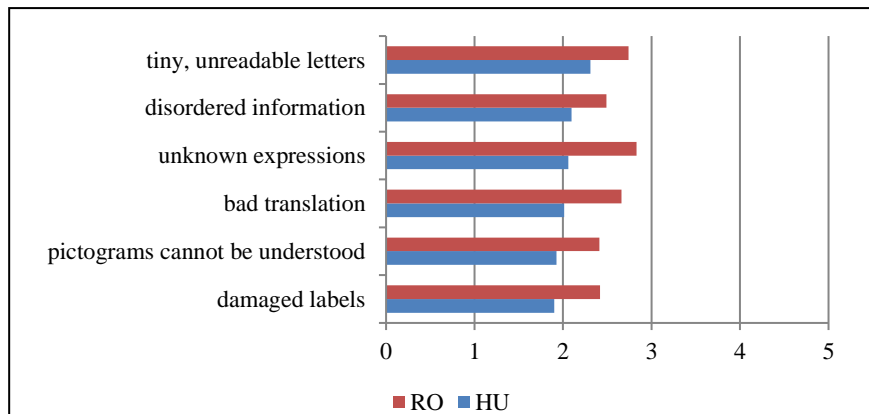


Figure no. 4: Mean values of the baby food label related problems

We considered it important to ask whether the mothers experienced any problem or deviation in the information of the products which were produced abroad and originally labelled with foreign labels. 147 people found that the foreign – language information of the foreign – produced product differed from the Hungarian translation of the label, of which 43 people did not buy this product any more. Many people wrote that there was a difference in the age recommendation, for many people had problems with the translation

of Eiwess (protein) or at the translation of the word ‘fish’ was not specifying, what kind of fish was it made. The added sugar was the same, which was indicated on the origin label but in the translation not. More people related that the label in the original language on the German products contained more information than the Hungarian.

We were curious about whether there is a connection between the mothers’ permanent address (country) and the information on the label of the baby food they use (figure no. 5). The significance level was acceptable for the following factors: list of ingredients (0,0), the indication of allergen (0,0), nutrition combination (0,0), weight (0,05), place of origin (0,04). The information on the other labels was disposed of too high significance level. Territorial differences are not so characteristic when reading the information content on the label. The illustrations and the colour do not have effect on the Hungarian and Romanian mothers, they are less aware of it when reading a label. There are significant differences between the packaging and the colour scheme of the products on the shelves, for example on the Univer baby foods we can find Winnie the Pooh and his friends’ fairy tale figures (we believe that it is influence the mothers less). The Hungarian mothers rated the list of the ingredients averagely with 4,6 points, the Romanian mothers gave 4,0 points, the Hungarian mothers pay more attention to the indication of allergen, averagely 4,3 points, the Romanian mothers rated this factor with 3,8 points. The rest of the factors there were not considerable difference between the Hungarian and Romanian mothers (RQ5). The mothers read more carefully the components, the shelf-life, the recommended age, and the nutrition composition on the label irrespective of the origin.

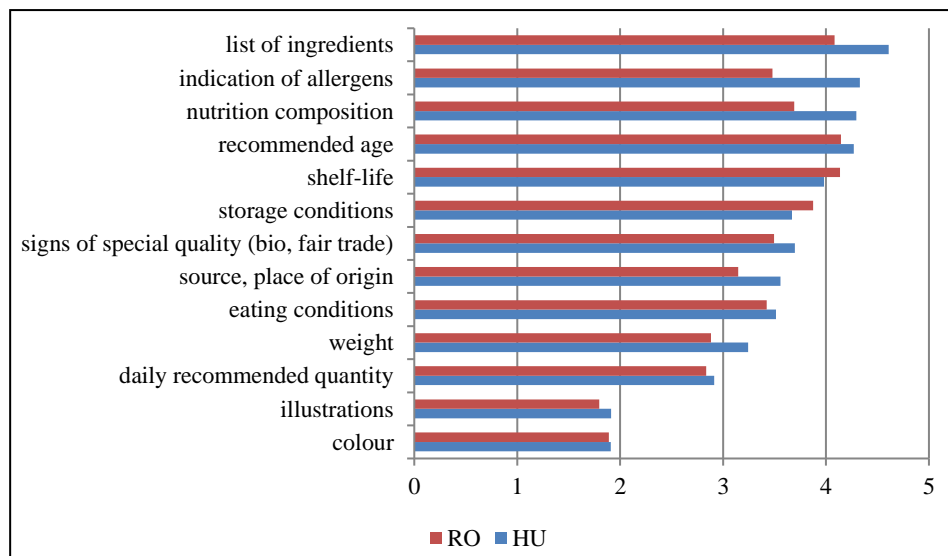


Figure no. 5: Mean values of the baby food label information preference scales

### 3.3. Factor analysis of the food label preference

We made factor analysis onto the question to what extent the following aspects are considered from the information on the baby food label. 390 mothers do not read the label carefully (of which 284 Romanian), another 603 mothers read the label carefully (of which 119 are Romanian). Before the calculations we checked the indicators were correct, the



variables followed normal distribution, we worked with metric and not dummy variables, between variables the multicollinearity was prevailed, the sample was homogenous and the sample size was above too, thus after the fulfilment of the necessary conditions, it could be accepted the fulfilment of the main component analysis. For the examination factors have to be correlated in pairs, it was done by Kaiser – Meyer – Olkin indicator. The closer you are to the value of 1, the more you can use the analysis to the variable. The same is shown by the Barlett's test, which uses a simple hypothesis test. The value of the Kaiser – Meyer – Olkin indicator was 0,851, which is quite good and reliable, so the main component analysis is acceptable for the variable set.

The Scree plot figure helped to decide how many factor groups were formed during the process, the breakpoint can be observed after the third variable number, so we tried to create 3 factors. The factor matrix (Component matrix) does not fit well because the variables do not fit onto the factors therefore the data have to be rotated. As a result of it, we got the rotated factor matrix (Rotated Component Matrix) (table no. 5). The rotation was made by Variomatrix procedure (variance maximising) with Kaiser Normalisation. The value of the explained variance should be at least 60%, in this case it is 61,8%. We consider a variable the member of a factor if the weight of the factor is at least 0,5.

**Table no. 5: Rotated Component Matrix of baby food label information preference**

	Component		
	1	2	3
Daily recommended quantity	0,607	0,191	0,374
Shelf - life	0,828	0,214	0,058
Storage conditions	0,865	0,190	0,115
Consumption suggestion	0,806	0,237	0,182
Recommended age	0,518	0,309	0,065
List of components	0,240	0,734	-0,196
Indicate of allergens	0,229	0,706	0,032
Nutritional composition	0,305	0,700	0,080
Special marks of quality (bio, fair trade)	0,089	0,736	0,255
Source, place of origin	0,213	0,606	0,268
Illustrations	0,150	0,056	0,890
Colour	0,129	0,044	0,884
Weight	0,188	0,376	0,421

Based on the obtained factors, the following three groups of information were identified: (1) dealing with the product, (2) content of the product, (3) appearance of the label. The most important information cluster is the second factor, related to product ingredients, the second focus of interest of the consumers are information related to usage and the least important factor contain the label design elements (RQ6).

**Conclusions**

The conscious consumer looks at the composition of the given food during the shopping, studying how much the flavour enhancers, the raising agents, food colouring, the stabilizer (Gintner, 1999). According to our results, and in line with the literature (Grunert and Wills, 2007), it is especially true for mothers with small children, as the child's health conditions

partly depend on the fact how they are nourished, and it is the parents' responsibility at the age of toddlers.

The present research revealed important differences in jarred baby food consumption preference between the two countries. In Romania, the proportion of the mothers who have already gave at least ones jarred baby food to their kids is much lower than in Hungary. The reasons are the preference for the home-made baby foods against the ready-made foods and the lack of trust in safety, healthiness and freshness of the jarred baby foods. The list of the most popular jarred baby foods, however, could induce speculations regarding some other reasons of non-consumption. In the Romanian list all the brands are global or import brands, while in Hungary the most popular baby food is the Kecskeméti one, which is a local brand, using local ingredients and adopting a more convenient pricing policy, even if it is produced by Hipp too. Maybe there is room for a well-built local baby food brand in Romania as well, which could encompass the key benefits that the Romanian mothers seek in case of baby foods: quality, fresh ingredients, home-made-like taste. Gritsai (2001) have signalled a heavy culture-specific baby-food consumption behaviour which „reflects regional differences in incomes, female employment, consumers' trust in producers, national healthcare principles, traditions of family life and child-upbringing, medical norms and the role of food in cultural heritage”.

The low rate of consumption is not surprising for the Romanian sample. According to experts in Romania (28 kg/year, 2014) the baby food consumption is very low compared to the European Union average (100kg/year, 2014). The baby food counts as a market gap in the baby food segment (pureé, biscuits, drinks) its share is below 20%, against the milk powder (baby formula) segment which is dominating this category. The experts have referred to the mothers' preferences for self-made foods and low purchasing power as reasons for non-consumption (Tănase, 2015). It is interesting that none of the Romanian mothers indicated the price of the baby foods as one of the reason of the non-consumption.

Gaining the confidence of consumers is key to the manufacturers (our survey shows that Romanian mothers do not buy ready-made baby foods due to lack of trust), so the information on the label should be more closely observed. It is important to know for companies, what kind of information mothers looking for on the labels. According to our survey (figure no.5) list of ingredients, allergens and nutrition composition are the three most important features. It will be useful to add the most important information on labels with larger font size.

Our main results are the following (answering our research questions): there is a difference between Romanian and Hungarian mothers regarding the baby food buying habits, in Hungary the percentage of mothers who give jarred baby food for their child and the frequency of the baby food intake is significantly higher (RQ1). The profile of the mothers buying jarred baby food for their child can be characterised by living in towns, capital or other, with one or two children, and the propensity to give jarred baby food to their child is growing by their age (RQ2). There is a relevant difference in motivation between Hungarian and Romanian mothers, the Hungarian mothers give more times jarred baby food, in particular by travelling, due to lack of time and diversification (RQ3). The mothers agree that the labels contain tiny, unreadable letters, disordered information, unknown expressions and bad translation. There are no major differences could be discovered between the countries by the main problems regarding baby food labelling (RQ4). The Hungarian mothers pay more attention to the indication of allergen and the enumeration of

the ingredients (RQ5). The most important information cluster is related to product ingredients, the second focus of interest of the consumers are information related to usage and the least important factor contain the label design elements (RQ6).

The food label terminology interpretation problems could be resolved by proper regulation and consumer education. A lot of baby nutrition trends are spread online from unauthorised people who influence the mother's knowledge, perception and attitude toward jarred baby foods. The rigorous regulation processes are based on scientific evidence, this information should be transferred to the consumers in a user-friendly way.

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