

## **Labeling of food allergens on prepacked foods intended for final consumption in Hungary**

**János Győrvári, Jenő Szigeti, László Varga\***

*Széchenyi István University, Faculty of Agricultural and Food Sciences, Department of Food Science,  
9200 Mosonmagyaróvár, Lucsony Street 15-17, Hungary*

---

### **Abstract**

It is a major responsibility of food processors to operate an allergen management system, which guarantees, among other things, that an appropriate label containing the required information is placed on the packaging of products. By examining 180 samples, we aimed to determine (i) to what extent labeling of allergens on prepacked foods intended for final consumers complies with the applicable legal requirements in Hungary and (ii) what kind of problems can be observed in this area. Our results showed that only 61% of the products complied with all the legal requirements examined in this study. Therefore, the staff of Hungarian food businesses clearly need to be further educated on proper labeling of food allergens.

**Keywords:** allergen, food allergy, food intolerance, labelling, compliance

---

### **1. Introduction**

Information provided on the packaging of food products is an important means of achieving the objective of health and consumer protection so that consumers can choose their foods after analyzing the appropriate information. Consumers may be influenced by different types of information when they make a decision on purchasing a specific product. Such information on the packaging may concern, for instance, compatibility with a healthy lifestyle or environmental awareness of the manufacturing process [1].

It is also an important consideration when selecting a product whether the food contains ingredients that may be harmful to health. Such ingredients include food allergens (e.g., peanut, egg, etc.) or other substances (e.g., gluten, lactose, etc.) that may cause health problems in people suffering from food allergy or food intolerance, respectively. Very often, even low levels of an allergenic substance may be harmful to persons suffering from food allergy, and may cause serious health damage or even death.

Food intolerance, such as lactose or gluten intolerance, does not usually lead to life-threatening conditions; however, the consumer may feel very sick, and this condition may have a negative impact on his/her long-term health status [2].

The significance of this issue becomes obvious even if we only take into consideration the number of persons suffering from food allergy. Food allergy affects approximately 10 to 20 million consumers in Europe alone. Because there is no cure for food allergy and food intolerance, people suffering from these conditions have to adjust their food consumption according to their individual sensitivity, i.e., they have to reduce or avoid the consumption of foods that contain the particular ingredient causing the intolerance or allergy [3]. Consumers have a single and effective tool that helps realize the danger, i.e., the information provided on the packaging of products. That is the reason why it is of major importance to provide this information correctly and in accordance with the applicable regulations.

Currently, the requirements for the labeling of food allergens on prepacked foods intended for final consumers in the European Union are determined by regulations [4, 5] and professional guidelines issued by national and international organizations. Whereas compliance with the regulations is mandatory for food businesses, the professional guidelines cannot be considered official legal materials. Their aim is to provide help to the members of the food chain concerning the practical application of regulations.

We conducted a study to evaluate how the requirements concerning the labeling of food allergens on the packaging of prepacked foods intended for final consumption are realized in practice in Hungary. Our objective was to determine the level of compliance with the allergen labeling

requirements, and to identify the problems that can be observed in this area.

## 2. Materials and Methods

The study was carried out in 2017. We purchased a total of 180 prepacked food samples from various retail stores all over Hungary. The samples belonged to one of the following pre-determined product categories: Seasonings; Oils, fats, margarine; Dairy products; Drinks; Meat and fish products; Confectionery products. Product categorization was based on Codex Alimentarius Hungaricus [6] and generally accepted food industry principles [7]. Every product included in this research contained ingredients causing either allergy or intolerance. Sample composition is shown in Table 1.

Table 1. Sample composition of the present study

Sample composition by					
Product category		Size of food business		Location of food business	
Confectionery products	30 samples	Large enterprises	40 samples	Budapest	63 samples
Drinks	30 samples			Central Hungary	55 samples
Dairy products	30 samples	Medium-sized enterprises	43 samples	Great Plain and North	43 samples
Meat and fish products	30 samples			Transdanubia	19 samples
Oils, fats, margarine	30 samples	Micro and small enterprises	97 samples		
Seasonings	30 samples				
<b>Total</b>	<b>180 samples</b>	<b>Total</b>	<b>180 samples</b>	<b>Total</b>	<b>180 samples</b>

In order to cover the widest possible range of products, only one product from any given food company was included in any product category. The products checked were of mixed origin (i.e., both Hungarian and foreign made); however, a Hungarian company as the manufacturer or

distributor of the product has been indicated on each product label. The question whether the food business indicated on the label was the manufacturer or distributor of the product was not investigated in this research because it did not affect the responsibility for proper labeling [8].

We examined the labels of the purchased products on the basis of requirements concerning the labeling of allergens, and the data obtained were analyzed from a number of aspects, i.e., product category, size and location of enterprise, etc. Size classification of the businesses was performed based on their net turnover, taking into consideration the requirements of the relevant legislation [9]. The location of the companies was determined on the basis of the address provided on the packaging of the examined products, and the location was classified using the NUTS 1 statistical territorial unit [10] with one exception, i.e., Budapest was considered a separate region. The address indicated on the packaging is usually where the headquarters of the company are located and consumer inquiries are handled and, thus, where decisions about labeling are made. However, for accuracy, we always checked whether the address on the packaging and the officially registered address of the company were the same. When there was a contradiction (in 6 out of 180 samples), we investigated through websites and social networking sites which address was defined by the company as the central one, and this address was then used for territorial classification. In 5 out of the 6 cases, the address indicated on the packaging proved to be the central address.

### 3. Results and Discussion

#### 3.1. Visibility and Legibility of Labeling

As specified in Regulation (EU) No. 1169/2011 [4], it is mandatory to indicate on the packaging of prepacked foods any ingredient or processing aid causing allergy or intolerance that has been used during the manufacturing of the food and that is still present in the finished product even if in an altered form. Allergen information, like any other mandatory information, shall be provided in a prominent place in such a way as to be easily visible, clearly legible, and indelible [4]. We have found that the degree to which the above requirements are fulfilled is high in Hungary because 98% of the food products checked met the requirements in terms of visibility and legibility.

#### 3.2. Font Size

Information, including allergen information, shall be printed on the package in characters using a font size where the x-height, as defined in the regulation, is equal to or greater than 1.2 mm. In the case of packaging the largest surface of which has an area

of less than 80 cm<sup>2</sup>, the x-height of the font size shall be equal to or greater than 0.9 mm [4]. Only 85% of the products checked fulfilled the labeling requirements concerning font size. When investigating the compliance with font size requirements by product category, we observed that the Drinks category had the highest compliance rate (100%), whereas the Seasonings and the Oils, fats, and margarine categories had the lowest rate of 77% (Figure 1).

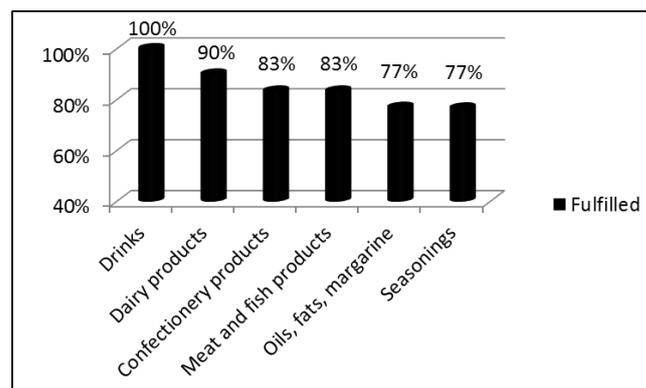


Figure 1. Level of compliance with legal requirements for font size by product category

#### 3.3. Location of Allergen Information

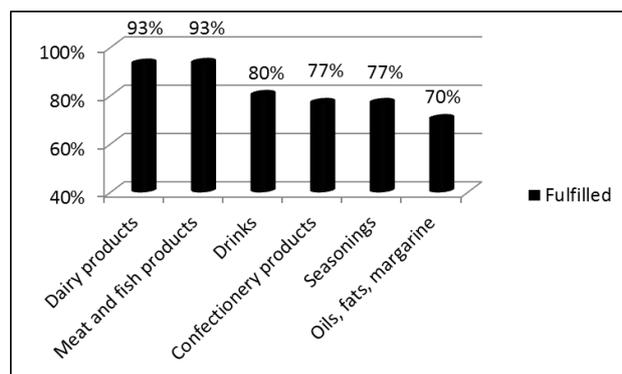
All substances causing allergy or intolerance must be indicated in the list of ingredients [4]. Our results showed that a very high rate (98%) of the foods inspected met this specific requirement.

#### 3.4. Highlighting of Ingredients Causing Allergy or Intolerance

The names of substances causing allergy or intolerance must be highlighted through a typeset that clearly distinguishes them from the rest of ingredients [4]. In Hungary, consumers may find various solutions for the indication of food ingredients causing allergy or intolerance. We observed that food businesses mostly used bold typefaces for this purpose (63%), whereas underlining (21%), capital letters (7%), or italics (6%) were less frequently encountered. The use of a different font color (1%), a different background color (1%), or a font size larger than the rest of the text (1%) was a rare occurrence. It should also be noted that food businesses combined the available methods to highlight the ingredients concerned in 38% of the products involved in this study.

We also evaluated the extent to which each product category met the legal requirements for highlighting. It was found that 18% of the samples

did not meet the requirements currently in force in this respect, which is quite a high percentage. Of the categories tested, Dairy products and Meat and fish products showed the highest rate of compliance with the requirements (93% both), whereas Oils, fats, and margarine showed the poorest result of 70% (Figure 2).



**Figure 2.** Level of compliance with legal requirements for emphasizing substances and products causing allergy or intolerance by product category

Regrettably, food businesses are not legally required to declare on the product label what the highlighting actually means. As a consequence, the frequency of voluntary declarations is rather low in Hungary because only 9% of the food products examined contained a text that provided a clear explanation about the meaning of different styles and/or graphics used in the case of certain ingredients.

### 3.5. Denomination of Ingredients Causing Allergy or Intolerance

All ingredients causing allergy or intolerance must be indicated on the label with a clear reference to the name of the substance or product as listed in the Regulation; however, this provision shall not be applied in cases where the name of the food clearly refers to the substance or product concerned, causing the allergy or intolerance [4]. This requirement has been met in 96% of the samples involved in the present study.

### 3.6. Voluntary Food Information

Voluntary food information is any information or labeling that is neither required nor prohibited by law; however, it is a general requirement for voluntary information that it shall not be misleading, ambiguous, or confusing for consumers [4].

Although food businesses are not legally required to label any unintentional or accidental contamination, so-called cross-contamination, by substances

causing allergy or intolerance, there are some food safety related documents, which are non-binding but used worldwide in the field of food manufacturing. Such documents include, for instance, the Global Standard for Food Safety issued by the British Retail Consortium and the IFS Food Standard. These require the labeling of any cross-contamination justified by risk assessment [11, 12].

We checked the labels of our prepacked food samples for voluntary information regarding the presence of cross-contaminants causing allergy or intolerance. Because of the specifics of the industry, 83% of the Confectionery products were labeled with information on possible cross-contamination. By contrast, all samples in the Drinks category lacked such labeling information. The corresponding values in the rest of the categories tested ranged between 7% and 37% (i.e., Oils, fats, margarine: 7%, Dairy products: 33%, Meat and fish products: 37%, Seasonings: 37%).

Generally, Hungarian food businesses used two types of warnings, one of which followed the “... may contain traces of ...” structure, directly referring to the fact that substances causing allergy or intolerance may be present in the product. The other type of warning (“the product was manufactured in a plant also using ...”) indirectly informed the consumer that the food processing facility where the product was made used ingredients causing allergy or intolerance and, for this reason, it could not fully be excluded that the particular product contained traces of such substances too. The two different warnings were not used with the same frequency by Hungarian food businesses because the vast majority (85%) of the labels belonged to the “... may contain traces of ...” version.

Contrary to the situation when substances causing allergy or intolerance are used as ingredients, no legislation requires that such substances be highlighted on the label if they are present in the product as a result of cross-contamination. Accordingly, our findings showed that ingredients causing allergy or intolerance were emphasized on the packaging of 82% of the samples, whereas the corresponding value for the same substances occurring as cross-contaminants was only 59%.

We examined to what extent Hungarian food businesses complied with the above described legal requirements regarding voluntary food information, and a fulfilment rate of 93% was found.

### 3.7. Overall Assessment

Based on the results presented in subsections 3.1. to 3.6., it appears that, in terms of fulfilling the legal requirements for labeling of food allergens, the two biggest challenges for food businesses were highlighting and font size (Figure 3). A plausible explanation for this is that the current requirements have only been in force since December 2014, and no similar legislation had previously existed.

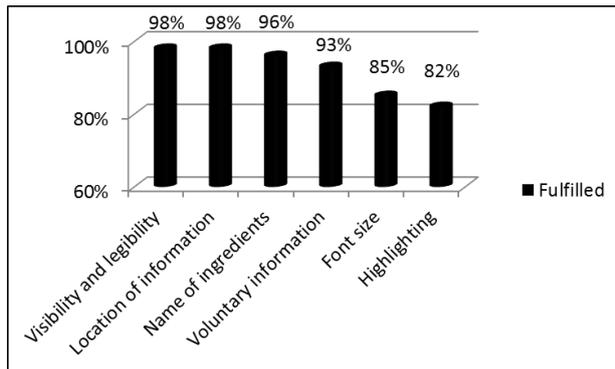


Figure 3. Level of compliance with labeling requirements

Our data on compliance have been evaluated from other viewpoints as well. Figures 4 to 6 show that only 61% of the prepacked food samples fulfilled all the legal requirements for labeling of allergens. In a previous research, wherein compliance with a wider range of labeling requirements was assessed according to the regulations in force at that time, we experienced problems in 26% of the food products examined [13], and this value was considerably superior to the non-compliance rate of 39% determined in the present work. It is worth mentioning that the product categories involved in these two studies were exactly the same.

As illustrated in Figure 4, the level of compliance with legal requirements for labeling of allergens was 83% in the Dairy products category, a value more than double that observed in the category of Oils, fats, and margarine (40%). The rest of the product categories showed results around the average (61%).

As far as the location of the food manufacturer or distributor is concerned, Transdanubian companies had the highest compliance rate (68%), whereas their counterparts in the Central Hungary region showed the lowest level of compliance (53%). The corresponding values for other regions were found to be as follows: Budapest, 63%; the Great Plain and Northern Hungary, 65% (Figure 5).

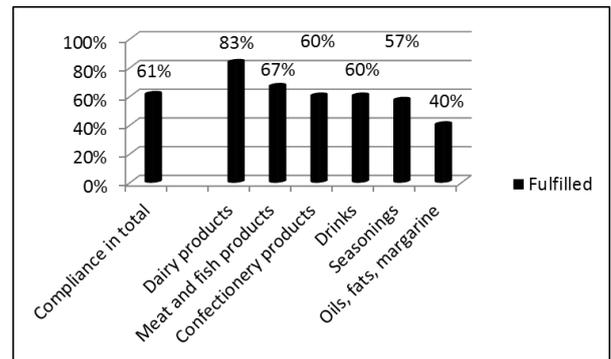


Figure 4. Level of compliance with legal requirements for labeling of allergens by product category

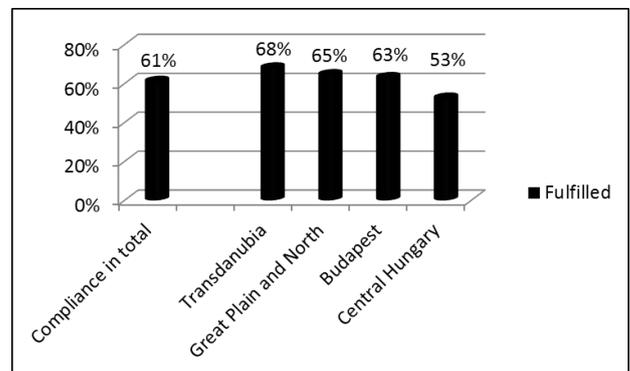


Figure 5. Level of compliance with legal requirements for labeling of allergens by location of the food businesses

As shown in Figure 6, the size of the food company largely influenced its capability of fulfilling the legal requirements for labeling of allergens, because the food products manufactured by large, medium-sized, and small (or micro) enterprises had compliance rates of 75%, 67%, and 53%, respectively.

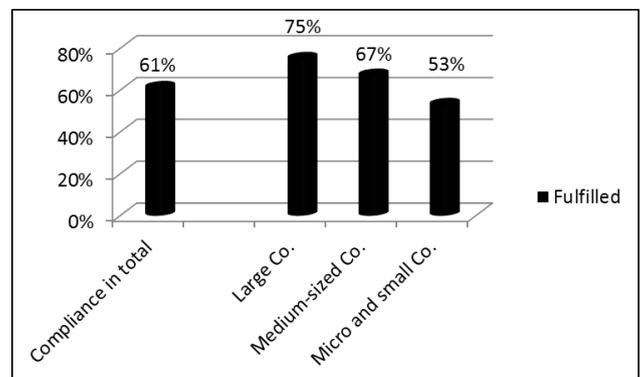


Figure 6. Level of compliance with legal requirements for labeling of allergens by size of the food companies

#### 4. Conclusions

All things considered, the staff of Hungarian food businesses need to be updated and further educated on food labeling issues in general and allergen labeling in particular. Special attention should be paid (i) to the product category of Oils, fats, and margarine, (ii) to companies operating in the Central Hungary region, and (iii) to micro and small enterprises, which showed the lowest level of compliance with legal requirements for labeling of allergens in this study. The findings of our research may help optimize the distribution of resources required for enhancing the level of compliance with legal requirements, thereby improving the protection of consumers' health.

**Acknowledgments:** Author L. Varga gratefully acknowledges research funding support from the European Union and the European Social Fund (Project No.: EFOP-3.6.1-16-2016-00017).

**Compliance with Ethics Requirements.** Authors declare that they respect the journal's ethics requirements. Authors declare that they have no conflict of interest and all procedures involving human / or animal subjects (if exist) respect the specific regulation and standards.

#### References

1. Győrvári, J.; Varga, L.; Szigeti, J., Application of visualization on the package of food products (in Hungarian), *Élelmiszer Tudomány Technológia (Food Science Technology)* **2016**, 70(2), 20-29
2. Food Standards Agency, *Guidance on allergen management and consumer information*, FSA, London, 2006, pp. 7-8, 30
3. FoodDrinkEurope, *Guidance on food allergen management for food manufacturers*, FoodDrinkEurope, Brussels, 2013, pp. 5-14, 16, 19, 26-28, 33-36, 39, 59, 81
4. The European Parliament and of the Council, *Regulation (EU) No. 1169/2011 on the provision of food information to consumers (and amendments)*, 2011, Articles 9 (1c), 12 (2), 13 (1-3), 21 (1), 36 (2), Annex II
5. The European Commission, *Commission Implementing Regulation (EU) No. 828/2014 on the requirements for the provision of information to consumers on the absence or reduced presence of gluten in food (and amendments)*, 2014
6. Hungarian National Codex Committee, *Codex Alimentarius Hungaricus (and amendments)*, 2009
7. Magda, S.; Marselek, S., *Fundamentals of agricultural and food technology: Food industry* (in Hungarian), Mezőgazdasági Szaktudás Publisher, Budapest, 2000, pp. 5-220
8. Hungarian National Assembly, *Act XLVI of 2008 on the food chain and its official control (and amendments)*, 2008, par 14 (4)
9. Hungarian National Assembly, *Act XXXIV of 2004 on small and medium-sized enterprises on support of their development (and amendments)*, 2004, par 3
10. Hungarian Central Statistical Office, *Statistical territorial units, January 1, 2016*, available at [http://www.ksh.hu/teruleti\\_atlasz\\_megyek](http://www.ksh.hu/teruleti_atlasz_megyek) (last accessed 2 April 2018)
11. British Retail Consortium, *Global Standard for Food Safety 7*, BRC, London, 2015, pp. 41
12. IFS Management GmbH, *IFS Food. Standard for auditing quality and food safety of food products, version 6.1*, IFS, Berlin, 2017, pp. 76
13. Győrvári, J.; Szigeti, J.; Varga, L., Practical application of new food labelling regulations by Hungarian food businesses (in Hungarian), *Élelmiszervizsgáló Közlemények (Journal of Food Investigation)* **2015**, 61(1), 529-541