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Compatibility of labelling gluten-free food products with current legal provisions based on the review of information on the labels

Zgodność znakowania bezglutenowych produktów żywnościowych z aktualnymi przepisami prawnymi na podstawie przeglądu informacji umieszczonych na etykietach

Natalia Mikołajczak

**Chair of Plant Raw Materials Chemistry and Processing
Faculty of Food Sciences, University of Warmia and Mazury in Olsztyn**

University of Warmia and Mazury in Olsztyn

Chair of Plant Raw Materials Chemistry and Processing

Pl. Cieszyński 1, 10-726 Olsztyn

e-mail: natalia.mikolajczak@uwm.edu.pl

Abstract

Introduction and aim: Gluten-free diet is a necessary diet in a treatment of gluten-dependent diseases. It means a complete exclusion from the menu of products being a source of gluten. An important issue in providing for consumers to choose the right gluten-free food product is the readability of information (about the presence of gluten in the product) and the ease of finding it on the packaging. The legal provisions on the labelling of this type of food require that the label be clearly and legibly formulated (e.g. gluten-free product) in a prominent place

on the packaging, which should be helpful for people with celiac disease and gluten allergies to recognize the suitable products. The aim of the article was to evaluate the compatibility of labeling gluten-free food products with current legal provisions based on the review of information on the labels.

Brief description of the state of knowledge: The research material was 125 labels of gluten-free products of various producers, which were available on the Masovian Voivodeship market (cereal and breakfast products (60), sugar and confectionery (35), fruit and vegetables products (8), meat and fish products (6), frozen products (4), drinks (2), other products (10)). The analysis included written and graphical information, which was found on the product label. 93 labels were characterized by the presence of 'gluten free product' in a vicinity of the product name. Very often, producers also placed a graphic sign in the form of a 'Crossed Ear' (98), also gave the license code next to the sign (93). On the cereal and breakfast products labels, manufacturers often placed additional written information to improve the product's credibility. Drinks were labelled only 'gluten-free products' (2), which is required by law.

Summary: In accordance with the obligation in the regulations, most of the tested product labels met this requirement. Very popular formulation on the labels was a 'gluten-free product', and less often other specified in legal requirements. Only a small percentage of the analysed product labels could raise doubts about the content of gluten and its safe consumption.

Key words: gluten-free diet, gluten-free food products, legal provisions, labels, safe consumption

Introduction

The incidence of gluten intolerance and many other health problems associated with the consumption of wheat and gluten is becoming more and more common in the world. For some people, this phenomenon begins to be even referred to as the 'epidemic of the 21st century' [1]. FAO/WHO has defined gluten as a protein fraction found in wheat, rye, barley, oats, their derivatives and hybrid varieties, which is insoluble in water and 0.5 M NaCl [2]. Currently, there are three major abnormal responses to gluten: allergic, autoimmune (e.g. celiac disease) and immunologically mediated hypersensitivity [3].

Gluten-free diet is the only effective way of treating diseases related to gluten consumption, and the effectiveness of this diet depends on strict, rigorous compliance with it, often even for

the whole life [4]. The basis of this diet is the exclusion of all gluten-containing products from the diet, they should be replaced with gluten-free counterparts made from raw materials not containing gluten, or those from which gluten has been removed by technological way [5, 6]. Labels and food packaging are often the only source of product information for the customer. In addition to information on nutrients and the composition of raw materials, they should also contain annotation about health risks resulting from their consumption. For people intolerant to gluten, providing information about its presence in the product is extremely important [7]. Since July 2016, the requirements for labeling of gluten-free foods are regulated by the provisions of Commission Implementing Regulation (EU) No 828/2014 of 30 July 2014 [8]. According to this Regulation, gluten-free products are those that naturally contain no gluten or contain gluten in a concentration lower than 20 ppm, or 20 mg/kg of product [9]. Only products containing less than 20 ppm of gluten on the package may include the designation 'gluten-free product', which should be in the immediate vicinity of the product name [10]. Placing this statement requires a manufacturer's guarantee that the above-mentioned the gluten level in the product has not been exceeded [11]. Natural gluten-free products should not be labeled as products of special dietary purpose, but they can be described as products naturally not containing gluten, provided that the requirements of gluten-free food are met [10]. Some people intolerant to gluten may tolerate small amounts of gluten within the limits of the specified values. In order for consumers to be able to find on the market food products that meet their needs and individual sensitivity thresholds, a selection of products with different low gluten content should be available. Such products should be appropriately labeled. The phrase 'very low gluten content' can only be used for products that have been specially processed to reduce the gluten content and do not exceed 100 mg/kg of gluten in food sold to the final consumer [9]. Placing the above information requires confirmation in analytical studies [10].

Information for consumers about the absence or reduced content of gluten in food is given in the form of written statements. Commission Implementing Regulation (EU) No 828/2014 specifies such phrases as 'suitable for people intolerant to gluten' or 'suitable for people with celiac disease'. In addition, the phrases may also be used: 'developed especially for people intolerant to gluten' or 'developed especially for people with celiac disease', if the food has been produced, prepared or processed specifically to reduce the gluten content of one or more of the ingredients containing gluten or replace ingredients containing gluten with other naturally gluten-free ingredients [9]. A characteristic feature of products for people on a gluten-free diet is also the sign of a 'Crossed Ear'. The use of this sign is not required by law, is voluntary and is for informational purposes only [7]. The 'Crossed Ear' is a registered EU trademark and its

use without a license is prohibited. Only the international symbol on the product means that it is a 100% safe product [8]. The Polish Association of People with Celiac Disease and the Gluten-free Diet is authorized to grant a license to use the 'Crossed Ear' sign in Poland. This organization is part of the European Association of Societies of People with Celiac Disease, which confirms the authenticity of the license [12, 13]. To mark products with the 'Crossed Ear' sign, producers must separate a special production line intended solely for the production of gluten-free products (or so arrange production to prevent contamination of products with gluten), and perform product tests using the R5 ELISA (intended for the labeling of gluten content) and obtain 'gluten-free' certificates [8]. Some manufacturers also use other variants of the 'Crossed Ear' sign, without the supervision of any institutions. Unfortunately, it does not always ensure that the product does not contain gluten [14].

The introduction of provisions on the labeling of gluten-free products may be a significant facilitation in the decision of product selection by people with allergies or gluten intolerance. The aim of the article was to evaluate the labels of selected food products of gluten-free foods in terms of meeting the legal requirements for the labeling of these products.

Material and methods

Research material

The research material was 125 labels of gluten-free products of various producers, which were available on the Masovian Voivodeship market (selected grocery stores). Food products (whose labels were evaluated) were divided into assortment groups: cereal and breakfast products (60 products), sugar and confectionery (35 products), fruit and vegetables products (8 products), meat and fish products (6 products), frozen products (4 products), drinks (2 products) and other products, in which were products not qualified for any of the above groups (10 products).

Analysis of information placed on the labels

The compliance of the labelling of gluten-free products with regard to current legal provisions was assessed solely on the basis of the information on the labels. The analysis included information such as written - formulation 'gluten-free product' and other formulations or additional information (the exact information present on the gluten-free product label was placed), graphical - sign of gluten-free product ('Crossed Ear') and license code that allows companies to use the 'Crossed Ear' sign. Written and graphical information were collected in

tables. In the information analysis, signs such as '+' were used if the information was included on the label, '-' if the information was not included on the label.

Overview of the results

Among the analysed labels of food products, the largest group were cereal and breakfast products [Tab. 1, Tab 2]. Their share constituted up to 50% of all food labels.

The 32 labels of cereal and breakfast products included the formulation 'gluten-free product', which was specified in the Regulation. This clearly indicates that these products contained less than 20 mg of gluten in 1 kg of product. 11 labels also contained other formulations specified in the Regulation such as 'suitable for people intolerant to gluten' and 'developed especially for people intolerant to gluten', including 3 of similar meaning. Manufacturers also placed the labels other than required by law determination of gluten-free food. 3 labels indicated that the products were produced separately from gluten-containing cereal, while 5 were certified by the Association of People with Celiac Disease and on a Gluten-free Diet. In addition, 2 labels indicated that the product naturally contains no gluten. In a significant amount, there was also a 'gluten-free' inscription, which was placed next to the list of ingredients in the product.

The most frequently placed information about the lack of gluten in the product was graphical information. 49 analysed product labels had a sign - the 'Crossed Ear' on the packaging, of which 45 had a license code next to it. It is a confirmation of the license purchase, which proves the applicability of this sign and indicates that the product is definitely safe. A very popular form of labelling a product (that does not contain gluten) was both placing the formulation 'gluten-free product' and the 'Crossed Ear' sign (21), in a large number (17) the license code was additionally indicated. As many as 25 labels did not have any specific formulations required by law, only had other additional ones (voluntary). Only 1 label ensured that the product contains less than 20 mg of gluten per 1 kg of product.

Tab. 1. Information about gluten-free food placed on the labels of cereal and breakfast products (part 1).

No.	<i>Written information</i>		<i>Graphical information</i>	
	formulation 'gluten-free product'	other formulations or additional information	'Crossed Ear' sign	license code
1.	+	-	-	-
2.	+	-	+	-
3.	+	-	+	-
4.	+	-	+	-
5.	+	-	+	-
6.	-	-	+	+
7.	-	-	+	+
8.	-	-	+	+
9.	-	-	+	+
10.	+	-	+	+
11.	+	-	+	+
12.	+	-	+	+
13.	+	-	+	+
14.	+	-	+	+
15.	+	-	+	+
16.	+	-	+	+
17.	+	-	+	+
18.	+	-	+	+
19.	+	-	+	+
20.	+	-	+	+
21.	+	-	+	+
22.	+	-	+	+
23.	+	-	+	+
24.	+	-	+	+
25.	+	-	+	+
26.	+	-	+	+
27.	+	suitable for people intolerant to gluten	+	+
28.	+	suitable for people intolerant to gluten	+	+
29.	-	gluten-free, does not naturally contain gluten	+	+
30.	-	gluten-free, does not naturally contain gluten	+	+

+ information on the label, - no information on the label;

Tab. 2. Information about gluten-free food placed on the labels of cereal and breakfast products (part 2).

No.	Written information		Graphical information	
	formulation 'gluten-free product'	other formulations or additional information	'Crossed Ear' sign	license code
1.	+	developed especially for people intolerant to gluten	-	-
2.	+	developed especially for people intolerant to gluten	-	-
3.	+	developed especially for people intolerant to gluten	-	-
4.	-	developed especially for people intolerant to gluten	+	+
5.	-	developed especially for people intolerant to gluten	+	+
6.	-	developed especially for people intolerant to gluten	+	+
7.	+	designed for people intolerant to gluten	-	-
8.	+	designed for people intolerant to gluten	+	+
9.	+	designed for people intolerant to gluten	+	+
10.	-	produced separately from gluten-containing cereal	+	+
11.	-	produced separately from gluten-containing cereal	+	+
12.	-	produced separately from gluten- containing cereal	+	+
13.	-	certified by the Association of People with Celiac Disease and on a Gluten-free Diet	+	+
14.	-	certified by the Association of People with Celiac Disease and on a Gluten-free Diet	+	+
15.	-	certified by the Association of People with Celiac Disease and on a Gluten-free Diet	+	+
16.	-	gluten-free, certified by the Association of People with Celiac Disease and on a Gluten-free Diet	+	+
17.	-	gluten-free, certified by the Association of People with Celiac Disease and on a Gluten-free Diet	+	+
18.	-	gluten-free	-	-
19.	-	gluten-free	-	-
20.	-	gluten-free	-	-
21.	-	gluten-free	-	-
22.	-	gluten-free	-	-
23.	-	gluten-free	+	+
24.	-	gluten-free	+	+
25.	-	gluten-free	+	+
26.	-	gluten-free	+	+
27.	-	gluten-free	+	+
28.	+	gluten-free	+	+
29.	+	gluten-free	+	+
30.	-	gluten-free, gluten content less than 20 mg/kg	-	-

+ information on the label, - no information on the label;

35 gluten-free products from sugar and confectionery group were found on the Masovian Voivodeship market [Tab. 3].

As many as 29 label products were determined by placing the formulation of 'gluten-free product' close to the product name. In addition, on 4 labels, the phrase 'developed especially for people intolerant to gluten', the use of which is also allowed and specified in the Regulation. Producers of gluten-free products also used such written information as developed for people on a diet excluding gluten, prepared from ingredients that do not contain gluten and wheat (1) and formulation 'gluten-free' next to the list of ingredients (15).

A graphic sign the 'Crossed Ear' was placed on 22 labels, where as many as 19 had the license code next to the sign.

As in the case of cereal and breakfast products, the most popular form of labelling gluten-free products such as sugar and confectionery, was placed in the vicinity of the product name the formulation such as 'gluten-free product' and the graphic sign ('Crossed Ear') with the license code (10). Also, such labelling as the 'gluten-free product' was often used (9). The formulation 'gluten free' placed next to the list of ingredients in the product was noted on 10 labels, of which 3 labels only had this way of labelling. 5 labels were characterized by the presence of both the 'gluten-free product', a characteristic symbol along with the license code and the formulation 'gluten-free' on the list of ingredients. 28 labels were in accordance with legal requirements (Commission Implementing Regulation No 828/2014). 1 label also had a gluten-free product label only in the form of the graphic sign.

Tab. 3. Information about gluten-free food placed on the labels of sugar and confectionery.

No.	<i>Written information</i>		<i>Graphical information</i>	
	formulation 'gluten-free product'	other formulations or additional information	'Crossed Ear' sign	license code
1.	+	-	-	-
2.	+	-	-	-
3.	+	-	-	-
4.	+	-	-	-
5.	+	-	-	-
6.	+	-	-	-
7.	+	-	-	-
8.	+	-	-	-
9.	+	-	-	-
10.	+	-	+	+
11.	+	-	+	+
12.	+	-	+	+
13.	+	-	+	+
14.	+	-	+	+
15.	+	-	+	+
16.	+	-	+	+
17.	+	-	+	+
18.	+	-	+	+
19.	+	-	+	+
20.	-	-	+	-
21.	+	gluten-free, developed especially for people intolerant to gluten	+	+
22.	+	gluten-free, developed especially for people intolerant to gluten	+	+
23.	+	gluten-free, developed especially for people intolerant to gluten	+	+
24.	+	gluten-free, developed especially for people intolerant to gluten	-	+
25.	+	gluten-free, developed for people on a diet excluding gluten, prepared from ingredients that do not contain gluten and wheat	+	+
26.	-	gluten-free	+	-
27.	-	gluten-free	+	-
28.	-	gluten-free	-	-
29.	-	gluten-free	-	-
30.	-	gluten-free	-	-
31.	+	gluten-free	+	+
32.	+	gluten-free	+	+
33.	+	gluten-free	+	+
34.	+	gluten-free	+	+
35.	+	gluten-free	+	+

+ information on the label, - no information on the label;

Analysis of labels of product groups such as fruit and vegetable products [Tab. 4], meat and fish products [Tab. 5], frozen products [Tab. 6] and drinks [Tab. 7] showed that their labelling was in line with legal requirements. All labels (20) were labelled 'gluten-free products' next to

the product name. In addition, it was the only written information of gluten-free products (no additional information on the label).

All products from the group: fruit and vegetable products (8) and frozen products (4) had graphical information in the form of the sign ('Crossed Ear'). This sign also appeared on 5 labels of meat and fish products. However, in drinks group, no product had the graphical information, the labels had not also the license code on the package (2). The license code was placed on all products from groups such as fruit and vegetable products (8), meat and fish products (6) and frozen products (4).

The most commonly observed form of labelling these groups was the presence on the product label at the same time information such as the formulation 'gluten-free products', the graphic sign ('Crossed Ear') and the license code, which was next to the graphic sign (17). In addition, it was observed that in the group of meat and fish products, the label consisted of the formulation 'gluten-free products' and the license code (1). Drinks were labelled only 'gluten-free products' (2), which is required by law.

Tab. 4. Information about gluten-free food placed on the labels of fruit and vegetable products.

No.	<i>Written information</i>		<i>Graphical information</i>	
	formulation 'gluten-free product'	other formulations or additional information	'Crossed Ear' sign	license code
1.	+	-	+	+
2.	+	-	+	+
3.	+	-	+	+
4.	+	-	+	+
5.	+	-	+	+
6.	+	-	+	+
7.	+	-	+	+
8.	+	-	+	+

+ information on the label, - no information on the label;

Tab. 5. Information about gluten-free food placed on the labels of meat and fish products.

No.	<i>Written information</i>		<i>Graphical information</i>	
	formulation 'gluten-free product'	other formulations or additional information	'Crossed Ear' sign	license code
1.	+	-	-	+
2.	+	-	+	+
3.	+	-	+	+
4.	+	-	+	+
5.	+	-	+	+
6.	+	-	+	+

+ information on the label, - no information on the label;

Tab. 6. Information about gluten-free food placed on the labels of frozen products.

No.	<i>Written information</i>		<i>Graphical information</i>	
	formulation 'gluten-free product'	other formulations or additional information	'Crossed Ear' sign	license code
1.	+	-	+	+
2.	+	-	+	+
3.	+	-	+	+
4.	+	-	+	+

+ information on the label, - no information on the label;

Tab. 7. Information about gluten-free food placed on the labels of drinks.

No.	<i>Written information</i>		<i>Graphical information</i>	
	formulation 'gluten-free product'	other formulations or additional information	'Crossed Ear' sign	license code
1.	+	-	-	-
2.	+	-	-	-

+ information on the label, - no information on the label;

The group under the name other contained all those products that were not adjusted to the above-mentioned groups [Tab. 8]. For example, here were products such as coffee, dark cocoa or kissel.

9 out of 10 products were labelled with the formulation 'gluten-free product', which was just next to the main product name. 1 label also contained the formulation 'developed especially for people intolerant to gluten', while the next one also indicated the certificate (certified by the Association of People with Celiac Disease and on a Gluten-free Diet).

All products in this group were characterized by the presence of a graphic symbol on the label (10). It was both the 'Crossed Ear' sign and the license code.

9 labels of gluten-free products had both the written information in the form of a 'gluten-free product' and the graphical information in the form of the sign and license code. Only on 2 labels, additional information was provided by the manufacturer. In addition, they also had the label required by law, and graphical information, including the license code. Only 1 product was labelled only graphically by placing the sign and entering the license code.

Tab. 8. Information about gluten-free food placed on the labels of other products.

No.	<i>Written information</i>		<i>Graphical information</i>	
	formulation 'gluten-free product'	other formulations or additional information	'Crossed Ear' sign	license code
1.	+	-	+	+
2.	+	-	+	+
3.	+	-	+	+
4.	+	-	+	+
5.	+	-	+	+
6.	+	-	+	+
7.	+	-	+	+
8.	-	-	+	+
9.	+	gluten-free, developed especially for people intolerant to gluten	+	+
10.	+	certified by the Association of People with Celiac Disease and on a Gluten-free Diet	+	+

+ information on the label, - no information on the label;

Considering the problems with the selection of products that may be used in a gluten-free diet, the introduction of provisions on gluten content is a significant facilitation in decision making by people with gluten allergy and intolerance [11]. As many as 93 labels of gluten-free products met the requirements of the current Regulation of 2014. In the vast majority, the producers used the formulation 'gluten-free product' in the vicinity of the product name, which facilitated the selection of the product by people intolerant to gluten. The formulation also confirms that these products contain less than 20 mg of gluten in 1 kg of product. Manufacturers have also included on the label other formulations specified in the Regulation such as 'suitable for people intolerant to gluten' (2) and 'especially developed for people intolerant to gluten' (14), including 3 of similar meaning (designed for people intolerant to gluten). In addition, on the labels of gluten-

free products, producers also provided other, voluntary labels, e.g. certified by the Association of People with Celiac Disease and on a Gluten-free Diet (6), produced separately from gluten-contained cereal (3), or simply placed the formulation 'gluten-free' next to the list of ingredients used during manufacture of the product (22).

Very often, the producers also placed a graphic sign in the form of the 'Crossed Ear' (98). In addition, in order to confirm the possibility of its use, they also provided the code of the purchased license next to the sign (91).

A popular form of labelling products was both the placement of the obligatory formulation 'gluten-free product' in the vicinity of the name and sign together with the license code (51), without any additional annotation. In addition, often the manufacturers have placed, beside the above information, other additional formulations to provide the consumer with a lack of gluten in the product, e.g. 'suitable for people intolerant to gluten' (2), 'developed especially for people intolerant to gluten' (6), and also 'gluten-free' next to the product ingredients (7). Only 5 products were labelled by placing only a sign characteristic of gluten-free food.

The vast majority of labels of gluten-free products available on the Masovian Voivodeship market analysed in this research showed compliance of the labelling with the current legal requirements set out in the Commission Implementing Regulation No 828/2014. Only a small percentage of labels can cause doubts about the safe consumption of the product for people on a gluten-free diet. Similar conclusions were found by Wojtasik et al. [11]. The aim of their work was the analysis of the labels of selected food products in terms of the correctness of information on the presence of gluten and the possibility of making an informed choice of suitable safe foods for use in a gluten-free diet. The results presented in this paper indicate that the tested products had no objections as to the method of their labelling.

Summary

A popular and important source of knowledge about the food products available on the market are their labels. The applicable regulations are to provide accurate and legible information regarding the composition of the product, especially regarding the content of allergenic components. This also applies to gluten, which is to facilitate people with celiac disease and gluten allergy to identify products permitted for use in a gluten-free diet.

An important issue in ensuring an easy selection of gluten-free foods is a legibility of the information on the composition of the product placed on labels and ease of finding this information on the package. In accordance with the obligation in the regulations to include clear, legible and specific formulations, placed in a visible place on the label, most of the tested

product labels met this requirement. Very popular formulation on the labels was a 'gluten-free product', and less often other specified in legal requirements. Only a small percentage of the analyzed product labels could raise doubts about the content of gluten and its safe consumption. Manufacturers also often use other way to label gluten-free products. In particular, they place the characteristic sign on the label together with the license code, sometimes even without the presence of indications required by law. To increase the credibility of the product that it is safe for people on a gluten-free diet, manufacturers place other, additional and voluntary indications.

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