

Gluten-Free Diet: a contribution to safety and informed choices



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Introduction

Food safety continues to mobilize all aspects of the food chain, from traders to consumers. Thus, labelling has proved to be an important tool during the buying decision: the label is the first link between the product and consumers. Providing them with relevant information about the product, allow them to make conscious, healthy and safe choices, especially those suffering from food allergies or intolerances.

Celiac disease (CD) is a chronic small intestinal immune-mediated enteropathy precipitated by exposure to dietary gluten in genetically susceptible individuals, hampering macro and micro nutrients absorption. It has not been possible until now to establish an acceptable daily intake of gluten that can be tolerated by people with celiac disease, which treatment currently consists of a gluten-free diet (GFD) throughout life.

In the last years, the impressive growth of CD incidence, significantly provoked changes in the dietary habit of an increasingly large population, with a rise in demand of gluten-free products. GFD is a complex and challenging diet but recent advances in the food industry are making it easier to follow.

Although several advances have been made in the preparation processes of gluten-free products, many of them, available on the market, exhibit a low nutritional quality. Previous studies have demonstrated that these products are poor sources of minerals, vitamins and fibre; therefore, its nutritional content is an increasing area of concern.

In addition, patients with CD tend to compensate the restrictions of a GFD by eating foods containing high levels of fat, salt, sugars and calories, leading to the risk of developing obesity and diseases related to the metabolic syndrome. Therefore, getting nutritional therapy should be an essential part of this complex disease.

Currently, shopping for commercial gluten-free products is less difficult than in the past, but still risky for those particularly sensitive to gluten because many foods aren't labelled accurately or consistently.

In accordance with the European Regulation No 1169/2011, which came into force on 13 December 2014, it's mandatory to include the substances or products that cause allergies or intolerances on the label. At European level there is a great concern with this type of food intolerance, therefore foodstuffs intended for particular nutritional use have a specific regulation (No 41/2009). This regulation, applicable since January of 2012, concerns the composition and labelling of foodstuffs suitable for people with gluten intolerance.

In order to comply with this Regulation and to insert reliable information on food labels, the Food and Nutrition Department's Chemistry laboratory, works with the food industry and carry out analysis for detection and quantification of gluten in food and raw materials. The laboratory has also collaborated with an Association of Support for celiac patients, in a food monitoring program intended for particular nutritional uses, in order to evaluate food products labelled "gluten-free".

Aims

The aims of this work were to evaluate the conformity of labelling, connected with gluten-free information, and to carry out analysis for detection and quantification of gluten in foodstuffs from food industry, so that reliable information can be inserted on the labels.



Methodology and Results

The Codex Alimentarius specifies in Codex Standard 118-1979 (2008) the R5 antibody based ELISA as the standard method for the determination of gluten, allowing for the detection of α -, β -, γ - e ω -prolamins. In this study we evaluated the gluten content of 51 samples (2010-2015) using the Sandwich R5-ELISA (RIDASCREEN® Gliadin) in conjunction with a cocktail solution, that allows for extraction of wheat, barley and rye prolamins from both unheated and heated foods.

Table 1. Analytical limits of Sandwich R5-ELISA method.

Analytical Limits	
Limit of Detection	3 mg/Kg
Limit of Quantification	5 mg/Kg

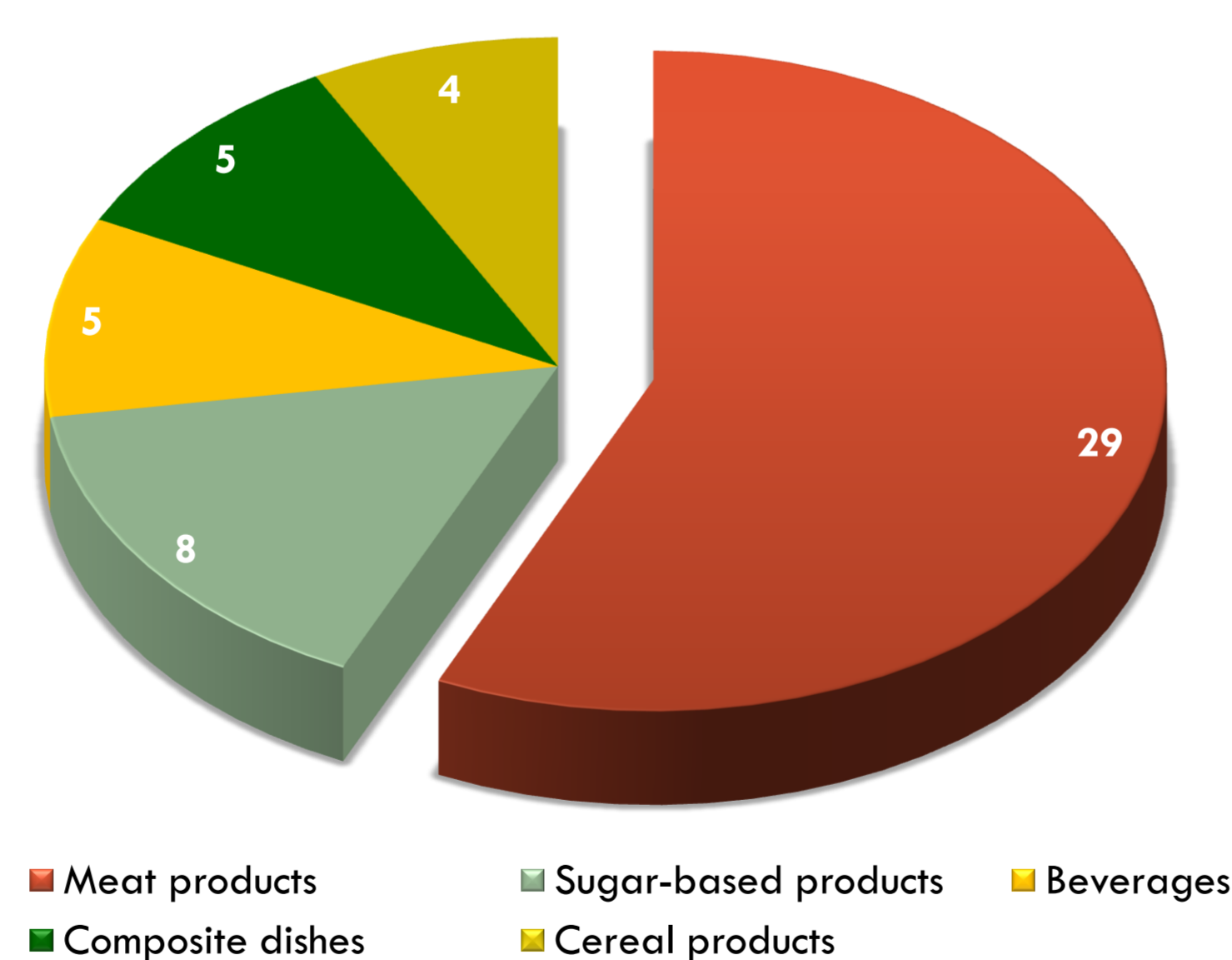


Figure 1. Number of samples analysed by food groups.

Table 2. Results of gluten analysis.

Food groups	Gluten results (mg/Kg)
Meat products	< 3
Sugar-based products	< 3
Beverages	< 3
Composite dishes	< 3
Cereal products	< 20

Conclusion

In samples obtained from the Food Industry, the results, below the limit of detection, showed that all of the samples can be safely labelled as "Gluten-free". Regarding the monitoring program, the results are in agreement with the information "Gluten-free" inserted on the labels, as all the samples contained levels of gluten below 20 mg/Kg.

This study underlines the importance of the laboratory in ensuring that the information "gluten-free" on the labels is reliable, so people with CD can make informed choices about the products available on the market.

References

[1] Codex Standard for Foods for Special Dietary Use for Persons Intolerant to Gluten (Codex Stan 118-1979); [2] Regulation (EU) No 1169/2011 of the European Parliament and of the Council of 25 October 2011 on the provision of food information to Consumers; [3] Commission Regulation (EC) No 41/2009 of January 2009 Concerning the composition and labelling of foodstuffs suitable for people intolerant to gluten; [4] RIDASCREEN® Gliadin - Enzyme immunoassay for the quantification analysis of gliadins and corresponding prolamins; [5] Pité, MR. Validation of an alternative method for gluten analysis in foodstuffs ELISA-R5: compared with current official method of analysis. Master's thesis in Quality Control and Food Toxicology, Faculty of Pharmacy, University of Lisbon, in 2007.