Tropentag 2026 September 16-18, 2026

Conference on International Research on Food Security, Natural Resource Management and Rural Development organised by the Universities of Göttingen and Kassel, Göttingen, Germany

Coeliac disease and the future of traditional gluten-rich foods: Evidence from four EU countries

Rhoda Naa Addoley Dromo Lomotey[1,3] , Frank Vriesekoop[2] , Viet- Hoa Le[3,2] , Rafia Halawany-Darson[4] , Beatriz Urbano[5] , Teresa Briz[6] , Stavroula Chrysostomou[7] , Elena Hadjimbei[7] , Jan Banout[1]

[1]Czech University of Life Sciences Prague, Fac. of Tropical AgriSciences, Dept. of Sustainable Technologies, Czech Republic
[2]Harper Adams University, Harper Food Innovation, United Kingdom
[3]Groupe ESA, France
[4]Université Clermont Auvergne, INRAE, VetAgro Sup, France
[5]University of Valladolid, Spain
[6]Polytechnic University of Madrid, Spain
[7]European University Cyprus, Dept. of Life Sciences, Cyprus

Abstract
The rise of gluten-related disorders such as Coeliac Disease (CD) and Gluten Intolerance (GI) across Europe challenges the continued consumption of traditional gluten-rich foods. While the existence of Coeliac disease is becoming more widely recognized, there is still a significant lack of thorough research that explores the complex relationship between gluten intolerance and consumer behavior in the context of traditional and regional food consumption within the European Union. This study aimed at analyzing data on consumer attitudes on gluten-free products in Belgium, France, Spain, and Cyprus while identifying trends in traditional food consumption. Using the purposive sampling approach and a cross-national survey of 2,005 respondents aged from 18 to 84 years and above, and other key predictors such as sex, reason for purchasing gluten-free products, and ranking of traditional or regional foods, the study explored the cultural value of gluten-rich foods and provided strategies for individuals with Coeliac disease to enjoy them. This study identified various measures, such as ingredient substitutions, processing techniques and cultural modifications, to enable people with coeliac disease participate safely in traditional culinary practices. This was achieved through an in-depth analysis of existing literature, dietary guidelines and available gluten-free alternatives. Consumer trends explained that while most participants purchased gluten-free products in the stores, others made them at home, others stopped eating regular gluten foods due to unavailability, high prices, and low quality, and others consumed gluten foods occasionally despite dietary preferences. In addition, the research evaluated the feasibility and efficacy of several approaches to promote the integration of people with coeliac disease into traditional dietary practices. Overall, this study provided an insightful assessment and practical recommendations for promoting dietary inclusion and improving the quality of life of people with coeliac disease.

**Corresponding author e-mail*: banout@ftz.czu.cz
Keywords: Coeliac disease, gluten-free alternatives, traditional food

Introduction

In recent years, the diagnosis and awareness of gluten intolerance have risen considerably, becoming a widespread public health concern throughout the European Union (EU) (Tovoli et al., 2015). As a result, consumer demands have significantly influenced the food industry due to the increasing number of gluten-related issues (El Khoury et al., 2018). Although gluten intolerance is more widely acknowledged today, there remains a significant gap in comprehensive research examining its impact on consumer behavior, especially in the context of traditional and regional food

consumption within the European Union, which is often an essential component of European culinary heritage (Tovoli et al., 2015).

Coeliac disease is an autoimmune disorder characterized by inflammation and atrophy of the small intestine's villi after gluten consumption. This results in the villi flattening, which reduces the surface area available for nourishment and absorption (Gandini et al., 2021). As a result, patients frequently suffer from bone disease (caused by calcium and vitamin D deficiency) and malabsorption of iron and folic acid. Muscle weakness, infertility, epilepsy, and mental disorders are other signs of celiac disease, though it's unclear what causes these symptoms. Some patients also suffer from a skin blistering condition called herpetiformis. Its symptoms can vary greatly and can be severe, resulting in disruptive symptoms, serious complications, and a negative impact on general quality of life (Gandini et al., 2021). Eliminating gluten from the diet is an essential part of treatment since it reduces inflammation and finally enables the villi to grow back. It normally takes two weeks for symptoms to get better (Gandini et al., 2021).

In almost every country, traditional foods help to preserve both national and regional heritage and culture. The idea of traditional food allows one to represent a nation or region, its unique culture, and history (Zrnić et al., 2021). Traditional cuisine also plays a significant role in identifying people's dietary patterns or consumption habits (Alibabić et al., 2012). Traditional meals can be prepared as homemade products by restaurants, small catering businesses, local factories, or simply prepared in-house. The exploration of traditional foods in Belgium, France, Spain, and Cyprus provides the cultural foundation for analyzing how gluten intolerance shapes consumer behavior and market adaptation. The main objectives of the study were i/to analyze existing data on consumer opinions regarding Gluten-Free Products (GFPs) in Belgium, France, Spain, and Cyprus, while identifying trends and preferences in the consumption of traditional/regional foods in these countries, ii/ investigate some of the traditional/regional foods in Belgium, France, Spain and Cyprus typically produced with gluten-rich flours (wheat, rye, barley), iii/ provide a thorough review of the cultural significance of these identified traditional/regional foods and finally iv/ to examine strategies and measures currently in place to help people with celiac disease partake in traditional/regional food consumption.

Material and Methods

The study was a cross-sectional online survey conducted in 2022 across four European countries i.e. Belgium, France, Spain, and Cyprus, on people's consumption of traditional gluten-free products following the CHERRIES guidelines (Eysenbach, 2004). A total of 2,005 respondents participated in the surveys carried out in these four countries. The purposive sampling approach was used, and all survey respondents were recruited through a social media call/newsletter from the respective national coeliac societies. The survey questions for this study can be divided into three groups: Sociodemographic data and gluten-free consumer group identification, whether participants make/bake, buy, have stopped consuming, and occasionally consume the gluten-free version of these traditional food products, which have been ranked accordingly and satisfaction, issues, and coping mechanisms which can be found in the discussion part of the study.

Results and Discussion

Table 1: Gender of participants in France (n=343), Belgium (n=391), Spain (n=1033) and Cyprus (n=238)

	France (%)	Belgium (%)	Spain (%)	Cyprus (%)
Gender	n=343	n=391	n=1033	n=238
Male	13.7%	9.2%	14.9%	22.3%
Female	86.3%	90.3%	85.0%	77.7%
Other	0.0%	0.5%	0.1%	0.0%

Table 2: Reasons why participants purchase GF food. France (n=343), Belgium (n=391), Spain (n=1033) and Cyprus (n=238)

	France (%)	Belgium (%)	Spain (%)	Cyprus (%)
Reasons for purchasing GF foods	n=343	n=391	n=1033	n=238
Coeliac Disease (CD)	67.3%	49.58%	66.7%	25.2%
Gluten Intolerance(GI)	11.4%	28.53%	8.3%	18.5%
Carer of someone with CD or GI	11.6%	22.99%	20.9%	27.7%
Other	1.2%	7.20%	0.5%	28.6%

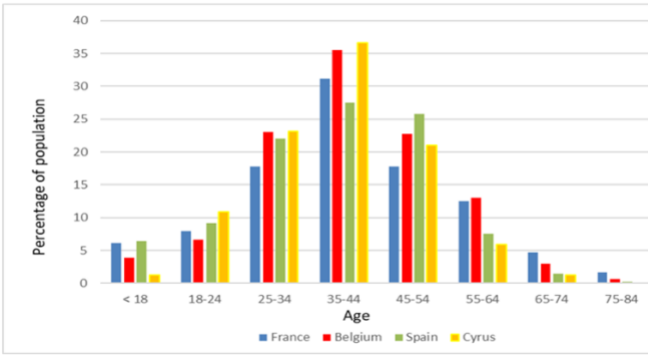

Figure 1: Age ranges of participants who took part in the survey in all 4 countries. France (n= 343), Belgium (n= 391), Spain (n=1033) and Cyprus (n=238).

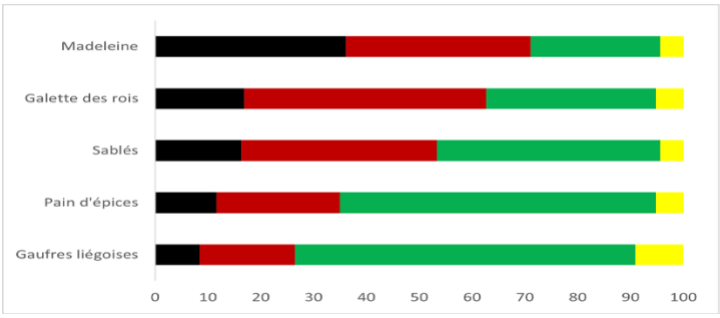

Figure 2: Top 5 traditional French foods consumed in gluten-free form (n=343).

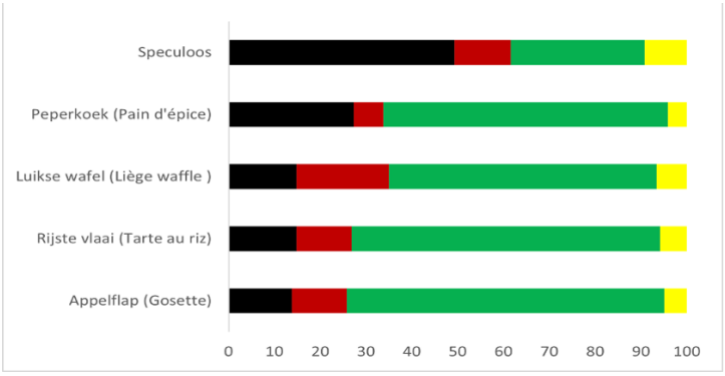

Figure 3: Top 5 traditional Belgian foods consumed in gluten-free form (n=391).

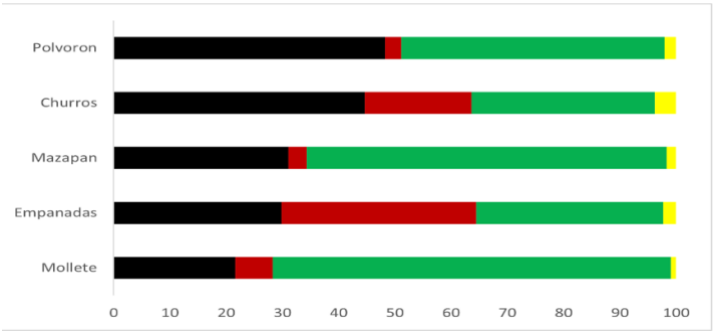

Figure 4: Top 5 traditional Spanish foods consumed in gluten-free form (n=1033).

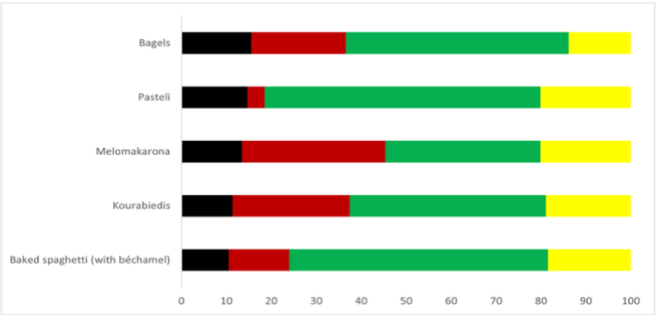

Figure 5: Top 5 traditional Cypriot foods consumed in gluten-free form (n=238).

A total of 2,005 participants across France (n=343), Belgium (n=391), Spain (n=1,033), and Cyprus (n=238) completed the survey. In Table 1and Figure 1, the sample was predominantly female (77.7–90.3%) and middle-aged (25–54 years), respectively, with Table 2 showing the majority diagnosed with Coeliac Disease (CD), though proportions varied considerably by country, notably Cyprus, where carers and "other" categories were more prominent.
Across all four countries, participants both purchased GF versions of traditional foods and prepared them at home, with home preparation emerging as the dominant strategy. In Figure 2, Figure 3, Figure 4, and Figure 5, the bars indicate the proportion of participants purchasing GF products in-store (black); homemade GF products (red); abandoned products due to inaccessibility (green); occasionally consumed in original form (yellow) respectively. In France, Madeleines and Galette des Rois were most frequently consumed in GF form, while Sablé and Pain d'épices saw the highest abandonment rates. In Belgium, Speculoos was most commonly adopted, while Peperkoek was most abandoned. Spanish participants most frequently consumed GF Empanadas and Churros, with Mollete and Mazapan most often discontinued. In Cyprus, Melomakarona and Kourabiedes were most adapted, while Bagels and baked spaghetti were most commonly abandoned. Across all countries, the primary drivers of food abandonment were poor GF product quality (texture, taste, excessive additives), inadequate or misleading labelling, high cost, and limited rural availability. These findings highlight a consistent gap between consumer need and market provision across all four countries. Home preparation served as the principal coping strategy, driven by distrust of commercial GF products and fears of cross-contamination. This aligns with evidence that rice, legume, and alternative-grain flours can successfully replicate traditional baked goods, though texture replication remains particularly challenging for bread-like products. Addressing these barriers requires improved GF labelling standards, greater product variety, and broader awareness among food service providers, enabling individuals with CD to participate more fully in traditional food culture without social or nutritional compromise.

Conclusions and Outlook

This study highlights the adaptive strategies employed by individuals with coeliac disease and gluten sensitivity across four EU countries to maintain cultural food participation while adhering to a gluten-free diet. Persistent barriers, including poor product quality, inadequate labelling, and limited accessibility, continue to compromise both dietary adherence and cultural inclusion. Standardized GF labelling and targeted policy interventions are essential to address these gaps and ensure equitable access to traditional food heritage.

References

1. Tovoli, F., Masi, C., Guidetti, E., Negrini, G., Paterini, P., & Bolondi, L. (2015). Clinical and diagnostic aspects of gluten related disorders. *World Journal of Clinical Cases: WJCC*, *3*(3), 275.
2. El Khoury, D., Balfour-Ducharme, S., & Joye, I. J. (2018). A review on the gluten-free diet: Technological and nutritional challenges. *Nutrients*, *10*(10), 1410.
3. Gandini, A., Gededzha, M. P., De Maayer, T., Barrow, P., & Mayne, E. (2021). Diagnosing coeliac disease: A literature review. *Human Immunology*, *82*(12), 930-936.
4. Zrnić, M., Brdar, I., & Kilibarda, N. (2021). The importance of traditional food quality—the viewpoint of the tourism. *Scientific journal" Meat Technology"*, *62*(1), 69-76.
5. Alibabić, V., Mujić, I., Rudić, D., Bajramović, M., Jokić, S., & Šertović, E. (2012). Traditional diets of Bosnia and the representation of the traditional food in the cuisine field. *Procedia-Social and Behavioral Sciences*, *46*, 1673-1678.