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# Food security of people with celiac disease in the Republic of Moldova through prism of public policies

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Food security is an important lever for the implementation of rights-based legislation, policies, and programs, while being a public health and socio-economic priority. Foodborne illnesses have a major impact on public health, and nutritional interventions are essential therapeutic strategies to combat them. Gluten ingestion has been linked to several clinical disorders, collectively called gluten-related disorders. The most serious of these is celiac disease. The only way to treat celiac disease is to stick to a gluten-free diet for life. Following a strict diet is also the only way to prevent the long-term consequences of the disease. Public policies are essential to ensure the food security of people with gluten-related disorders. The aim of the research is to assess the level of care for people with celiac disease in the Republic of Moldova, in terms of public policies, to ensure a sustainable sector that effectively satisfies the food security of people with disorders associated with gluten consumption. To assess the level of care for people with gluten-related disorders, the working algorithm was taken, with reference to global public policies in support of people with celiac disease, developed and validated by Falcomer et al., Focused on 6 items. The results of the study showed that the Republic of Moldova does not have adequate policy support to ensure food security for people with gluten-related disorders, which poses major challenges and, as a result, may increase the complications of these problems.

## KEYWORDS

public policy, celiac disease, gluten free products, level of care, food security, Republic of Moldova

## Introduction

The flexible concept of food security, which emerged in the 1970s in a time of global food crisis, has undergone multiple changes and interpretations, moving from a definition focused on food production to one focused on nutrition. Food security is considered to exist when all people always have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and preferences for an active and healthy life (1–4). Food security is a rather complex notion and focuses on four important dimensions, to which the fifth—sustainability—has subsequently been anchored (Supplementary Figure 1).

1. FAO, FAO, OAA, World Food Summit. *World Food Summit: 13–17 November 1996, Rome, Italy*. Rome: FAO, Food and Agriculture Organization of the United Nations (1996).
2. FAO, General Affairs and Information Department F, Economic and Social Department. *The State of Food Insecurity in the World 2001*. Rome: FAO (2001).
3. Peng W, Berry EM. The concept of food security. In: *Encyclopedia of Food Security and Sustainability*. Amsterdam: Elsevier (2019). p. 1–7. Available online at: <https://linkinghub.elsevier.com/retrieve/pii/B9780081005965223147> (accessed May 13, 2022).
4. FAO Agriculture and development Economics Division with support from FAO Netherlands Partnership Programme (FNPP). *EC—FAO Food Security Programme. Policy Brief*. (2006). Available online at: [https://www.fao.org/fileadmin/templates/faotail/documents/pdf/pdf\\_Food\\_Security\\_Cocept\\_Note.pdf](https://www.fao.org/fileadmin/templates/faotail/documents/pdf/pdf_Food_Security_Cocept_Note.pdf).
5. Conceição P, Levine S, Lipton M, Warren-Rodriguez A. Toward a food secure future: Ensuring food security for sustainable human development in Sub-Saharan Africa. *Food Policy*. (2016) 60:1–9. doi: 10.1016/j.foodpol.2016.02.003
6. Ayala A, Meier BM. A human rights approach to the health implications of food and nutrition insecurity. *Public Health Rev.* (2017) 38:10. doi: 10.1186/s40985-017-0056-5
7. World Health Organization, Conseil Exécutif. *WHO Global Strategy for Food Safety/Stratégie Mondiale de l’OMS Pour la Sécurité Sanitaire Des Aliments*. WHO (2021). Available online at: [https://apps.who.int/gb/ebwha/pdf\\_files/EB150/B150\\_25-fr.pdf](https://apps.who.int/gb/ebwha/pdf_files/EB150/B150_25-fr.pdf) (accessed Jun 4, 2022).
8. United Nations System Standing Committee on Nutrition. *Assessing the impact of policies to promote a healthy food environment and healthy diets*. (2016). Available online at: <https://www.unscn.org/uploads/web/news/document/UNSCN-Impact-Assessment-DP-FR.pdf> (accessed Jun 4, 2022).
9. Koithan M, Devika J. New approaches to nutritional therapy. *J Nurse Practitioner*. (2010) 6:805–6. doi: 10.1016/j.nurpra.2010.07.001
10. Al-Toma A, Volta U, Auricchio R, Castillejo G, Sanders DS, Cellier C, et al. European Society for the Study of Coeliac Disease (ESsCD) guideline for coeliac disease and other gluten-related disorders. *United European Gastroenterol J.* (2019) 7:583–613. doi: 10.1177/2050640619844125
11. Taraghikhah N, Ashtari S, Asri N, Shahbazkhani B, Al-Dulaimi D, Rostami-Nejad M, et al. An updated overview of spectrum of gluten-related disorders: clinical and diagnostic aspects. *BMC Gastroenterol.* (2020) 20:258. doi: 10.1186/s12876-020-01390-0
12. Wieser H, Segura V, Ruiz-Carnicer Á, Sousa C, Comino I. Food safety and cross-contamination of gluten-free products: a narrative review. *Nutrients*. (2021) 13:2244. doi: 10.3390/nu13072244
13. Siminiuc R, Turcanu D. Certain aspects of nutritional security of people with gluten-related disorders. *FNS*. (2020) 11:1012–31. doi: 10.4236/fns.2020.1111072.
14. Melini V, Melini F. Gluten-free diet: gaps and needs for a healthier diet. *Nutrients*. (2019) 11:170. doi: 10.3390/nu11010170
15. Dolinšek J, Dolinšek J, Riždnik P, Krenčnik T, Klemenak M, Mijatov MAK, et al. Life with celiac disease/Viața cu boala celiacă. *INSMC Alessandrescu-Rusescu*. (2021). p. 76. Available online at: [https://www.interreg-danube.eu/uploads/media/approved\\_project\\_output/0001/48/9d1dbf5e30a5329690faefee43147bd67750ea6a.pdf](https://www.interreg-danube.eu/uploads/media/approved_project_output/0001/48/9d1dbf5e30a5329690faefee43147bd67750ea6a.pdf)
16. Al-sunaid FF, Al-homidi MM, Al-qahtani RM, Al-ashwal RA, Mudhish GA, Hanbazaza MA, et al. The influence of a gluten-free diet on health-related quality of life in individuals with celiac disease. *BMC Gastroenterol.* (2021) 21:330. doi: 10.1186/s12876-021-01908-0
17. Sapone A, Bai JC, Ciacci C, Dolinsek J, Green PH, Hadjivassiliou M. Spectrum of gluten-related disorders: consensus on new nomenclature and classification. *BMC Med.* (2012) 10:1–12. doi: 10.1186/1741-7015-10-13
18. Demirkesen I, Ozkaya B. Recent strategies for tackling the problems in gluten-free diet and products. *Critical Rev. Food Sci. Nutr.* (2022) 62:571–97. doi: 10.1080/10408398.2020.1823814
19. Chirsanova A, Reșitca V, Siminiuc R, Suhodol N, Popovici C, Deseatnicov O, et al. *Innovative Food Products*. (2021). p. 455. Available online at: [https://zenodo.org/record/5563412#\\_Yy11M-xBw-Q](https://zenodo.org/record/5563412#_Yy11M-xBw-Q)
20. Mozaffarian D, Angell SY, Lang T, Rivera JA. Role of government policy in nutrition—barriers to and opportunities for healthier eating. *BMJ.* (2018) 361:k2426. doi: 10.1136/bmj.k2426
21. Qureshi ME, Dixon J, Wood M. Public policies for improving food and nutrition security at different scales. *Food Sec.* (2015) 7:393–403. doi: 10.1007/s12571-015-0443-z
22. Falcomer AL, Luchine BA, Gadelha HR, Szlemenczi JR, Nakano EY, Farage P, et al. Worldwide public policies for celiac disease: are patients well assisted? *Int J Public Health.* (2020) 65:937–45. doi: 10.1007/s00038-020-01451-x
23. FAO. Codex Alimentarius. Standard for foods for special dietary use for persons intolerant to gluten. (2008). Available from: [https://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252Fstandards%252FCXS%2B118-1979%252FCXS\\_118e\\_2015.pdf](https://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252Fstandards%252FCXS%2B118-1979%252FCXS_118e_2015.pdf) (accessed Apr 29, 2022).
24. UE. Commission implementing regulation (EU) No 828/2014 of 30 July 2014 on the requirements for the provision of information to consumers on the absence or reduced presence of gluten in food. *Official J Eur Union*. Available online at: <https://eur-lex.europa.eu/legal-content/EN/TEXT/PDF/?uri=CELEX:32014R0828&from=EN> (accessed Sep 6, 2022).
25. European Union Law. 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. (2011). Available online at: <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex%3A32011R1169> (accessed May 12, 2022).
26. Food and Drug Administration, HHS. *Food Labeling: Gluten-Free Labeling of Fermented or Hydrolyzed Foods*. (2020). Available online at: <https://www.federalregister.gov/documents/2020/08/13/2020-17088/food-labeling-gluten-free-labeling-of-fermented-or-hydrolyzed-foods> (accessed May 02, 2022).
27. Crossed grain trademark product certification. (2019). Available online at: <https://www.coeliac.org.uk/document-library/6462-certification-pack-crossed-grain-tm-european-companies-2019/crossed-grain-tm-european-companies-2019.pdf> (accessed May 2, 2022).
28. World Bank in Moldova. *Synthesis of the activity program in the country/Sinteza programului de activitate în țară*. (2018). Available online at: <https://thedocs.worldbank.org/en/doc/203121525075159390-0080022018/original/MoldovaCountrySnapshotSM2018FinalRO.pdf> (accessed Jun 2, 2022).
29. National Bureau of Statistics of the Republic of Moldova. *Moldova in numbers. Statistically brief*. (2019). Available online at: [https://statistica.gov.md/public/files/publicatii\\_electronice/Moldova\\_in\\_cifre/2019/Breviar\\_ro\\_2019.pdf](https://statistica.gov.md/public/files/publicatii_electronice/Moldova_in_cifre/2019/Breviar_ro_2019.pdf) (accessed Jun 2, 2022).
30. Worldometer. *Moldova Population*. Available online at: <https://www.worldometers.info/world-population/moldova-population/> (accessed May 02, 2022).
31. Siminiuc R, Turcanu D. The impact of the pandemic on the Agri-food system. *JSS*. (2020) 3:85–94. doi: 10.5281/zenodo.3971973

32. Kocsis D, Csaplár M, Jócsák E, Pák P, Tóth Z, Miheller P, et al. Celiac disease association with other autoimmune disorders: three case reports. *CRIM*. (2014) 2:23. doi: 10.5430/crim.v2n1p23
33. Rumble T, Wallace A, Deepes C, McVay K, Curran M, Allen J, et al. New food labelling initiatives in Australia and New Zealand. *Food Control*. (2003) 14:417–27. doi: 10.1016/S0956-7135(03)00036-7
34. World Bank. Moldova. *Food security and agricultural health management: action plan*. Available online at: <http://web.worldbank.org/archive/website01535/WEB/IMAGES/MDFOOD-2.PDF> (accessed Jun 4, 2022).
35. Ministry of Health. HG. RM nr.01\_04. *Health regulations on nutrition labeling, food labeling for special dietary purposes, product labeling genetically modified or derived from genetically modified organisms*. (2004). Available online at: <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=306412> (accessed May 13, 2022).
36. Parliament of the Republic of Moldova. *LAW nr. 279 on consumer information on food/Legea nr. 279, privind informarea consumatorului cu privire la produsele alimentare*. (2017). Available from: <https://www.usmf.md/sites/default/files/2020-01/Lege%20privind%20informarea%20consumatorului%20cu%20privire%20la%20produsele%20alimentare%20281%29.pdf> (accessed May 19, 2022).
37. Gluten: a group of proteins that people with gluten-related disorders should avoid. Ottawa, ON: Health Canada = Santé Canada. (2020).
38. Food and Agricultural Import Regulations and Standards - Narrative. USDA Foreign Agricultural Service. (2015). Available online at: [https://apps.fas.usda.gov/newgainapi/api/report/downloadreportbyfilename?filename=Food%20and%20Agricultural%20Import%20Regulations%20and%20Standards%20-%20Narrative\\_Wellington\\_New%20Zealand\\_12-31-2015.pdf](https://apps.fas.usda.gov/newgainapi/api/report/downloadreportbyfilename?filename=Food%20and%20Agricultural%20Import%20Regulations%20and%20Standards%20-%20Narrative_Wellington_New%20Zealand_12-31-2015.pdf) (accessed May 22, 2022).
39. Celiac Disease Foundation. *Policies Around the World*. Available online at: <https://celiac.org/gluten-free-living/global-associations-and-policies/policies-around-the-world/> (accessed September 06, 2022).
40. Australian Government. *Australia New Zealand Food Standards Code – Schedule 4 – Nutrition, health and related claims*. Federal Register of Legislation. Available online at: <https://www.legislation.gov.au/Details/F2017C00711> (accessed Sep 5, 2022).
41. Direzione generale della sanità, Servizio sanità pubblica veterinaria e sicurezza alimentare. *Regional guidelines for collective catering/Linee guida regionali per la ristorazione collettiva*. (2018). Available online at: [https://www.aslnooro.it/documenti/3\\_212\\_20190108095002.pdf](https://www.aslnooro.it/documenti/3_212_20190108095002.pdf) (accessed May 22, 2022).
42. Anelli S, Boni S, Caputo M, Caroli M, Ciampella AA, Copparoni R, et al. National GUIDELINES for school restaurants. *Ministry of Health*. (2010).
43. Mihi I, Clichici D. Celiac disease in children. *Clinical protocol for children PCN-167*. Ministry of Health of the Republic of Moldova. (2016). Available online at: [http://89.32.227.76/\\_files/15541-PCN%2520-%2520Boala%2520celiac%25C4%2583%2520la%2520copil.pdf](http://89.32.227.76/_files/15541-PCN%2520-%2520Boala%2520celiac%25C4%2583%2520la%2520copil.pdf) (accessed May 22, 2022).
44. Mihi I. *Institutional clinical protocol/ Protocol clinic instituțional*. IMSP ICSDOSMC (2012). Available online at: [https://mama-copilul.md/images/managementul\\_calitati/protocol\\_institutional/BOALA-CELIACA.pdf](https://mama-copilul.md/images/managementul_calitati/protocol_institutional/BOALA-CELIACA.pdf) (accessed May 13, 2022).
45. Government of the Republic of Moldova. *Government Decision No. 357 regarding the determination of disability*. 20-04-2018 in Monitorul Oficial Nr. 126-132 art. 399. (2018). Available online at: [https://www.legis.md/cautare/getResults?doc\\_id=122620&lang=ro#](https://www.legis.md/cautare/getResults?doc_id=122620&lang=ro#) (accessed Jun 2, 2022).
46. Law NR.60. *The social inclusion of persons with disabilities*. The Parliament of the Republic of Moldova. (2012). Available online at: [https://www.legis.md/cautare/getResults?doc\\_id=94168&lang=ro](https://www.legis.md/cautare/getResults?doc_id=94168&lang=ro) (accessed Sep 6, 2022).