Journal of Disaster & Emergency Research
http://jder.ssu.ac.ir
eISSN: 2588-6150
2021; 4(1): 1-3
10.18502/JDER.4392

Food Security in Disasters by Using Food Packaging

Jalal Sadeghizadeh Yazdi

Department of Food Sciences & Technology, School of Public Health, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

ARTICLE INFO

Letter to the Editor

Article history:
Received: 18 June 2020
Revised: 28 Sep. 2020
Accepted: 5 Oct. 2020

*** Corresponding Author:**
Jalal Sadeghizadeh Yazdi

Address:
Department of Food Sciences & Technology, School of Public Health, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

Email:
jsyazdy@yahoo.com

Tel:
+98-35-31492256

Disasters are unpredictable, but measures can be taken before and after the disasters to minimize the damages and optimize the recovery process (1). Water and food are always essential for surviving during disasters. Therefore, people who live in disaster-prone areas should prepare basic disaster supplies kits containing adequate amounts of non-perishable food and enough water for at least 3 days (2). A number of principles should be observed at the time of disasters, such as food inspections, decisions about whether consumption or non-consumption of the water and food leftover in critical situations, kitchen health, provision of food assistance and temporary cooking facilities, response to foodborne diseases, and community training (2). Food systems include activities related to the production, distribution, supply, and consumption of food that will have socio-economic and environmental consequences (3). Following natural disasters, managerial challenges such as poor management, ineffective responses, improper balance mechanisms, and poor food distribution methods are very challenging (4). A sustainable food system ensures food security and nutrition for all members of the community by taking into account the economic, social, and environmental factors with regard to generations (5). To achieve the goal of sustainable development, terminate hunger, achieve food security, improve nutrition, and promote sustainable agriculture, the food system must provide high-quality diets, which are nutritious and economic (6). Considering that carbohydrate-rich foods have a longer shelf life compared with the fresh and nutritious foods, they can be used in post-disaster situations to provide the required energy for the survivors (7). Foods with high shelf life are preferred for emergency response and fulfill the short-term needs of disaster survivors. Essential foods, whilst having a dietary diversity, should be healthy and safe and have proper packaging and can meet the nutritional needs of different groups (8). Food requirements of disaster survivors should meet their physical and psychological needs until they can return to their normal life. The appetency of disaster survivors for food consumption depends on the geographical area and severity of the disaster, because climate changes along with diverse climatic and geographical conditions are among the major challenges that threaten the food security of many people easily (4,9). Dates are among the carbohydrate-rich foods with

hydroscopic properties that can provide the required energy for disaster survivors. Dates contain soluble and insoluble fiber, B-group vitamins, and folate. This favorable fruit is cultivated in arid and semiarid regions, especially in South Africa and West Asian countries such as Iran. Iran is one of the largest producers of dates in the world, and various materials and technologies are applied in reducing the amount of date waste and increasing its storage time for use in disaster situations. One of these methods is Modified Atmosphere Packaging (MAP), which is highly applicable in meeting food security goals. This type of packaging can reduce the presence of insects and molds while maintaining qualitative characteristics (10). Food packages in disaster conditions should be served without the necessity of cooking. Furthermore, the packaging containers should be warm easily and without changing the taste of food (9). The selection of the appropriate packaging material for hydroscopic foods is one of the most important prerequisites for increasing food security in natural disasters. All dehydrated foods are hydroscopic and tend to absorb water vapor from their environment. When hydroscopic foods reach equilibrium with the surrounding, their moisture content increases (11). However, the growth of microorganisms, especially molds and insects is facilitated in food products stored with high moisture content. As a result, crisis management will be encountered with major problems for dry foods considered for disaster situations, contain insects and molds (12). Various factors such as food contact surface and environmental conditions (relative humidity and temperature) can affect the barrier properties of the packaging material. Besides, the permeability of the package be affected by the film structure, thickness, surface, temperature, pressure differential, and concentration gradient (13, 14). Research has shown that low-density polyethylene, polypropylene, and 2 or 3-layer packing materials can increase the shelf life of hydroscopic foods from 12 to 42 weeks (12). According to the definition of food systems provided by the Food and Agriculture Organization, the global research and development trend is towards application of the renewable and environmentally friendly packaging materials. Recent research in the food packaging industry has introduced starch as one of the important sources in producing biodegradable films. Therefore, using this type of packaging can reduce the environmental problems and increase the shelf life of foods supplied in disasters (15).

Acknowledgments

Not applicable.

Funding source

No funding source was allocated to this study.

Conflict of interest

The author declares no conflict of interest.

Authors' contribution

The author conceived and conducted the study alone.

References

1. Watson RR, Tabor JA, Ehiri JE, et al. Handbook of public health in natural disasters: Wageningen Academic Publishers The Netherlands; 2015, p.15.
2. Gupta RK, Minhas D, Minhas S. Food Safety in the 21st Century: Public Health Perspective; 2017;427-434.
3. Food and Agriculture Organization of the United Nations. Sustainable food system-Concept and Framework. 2014. Available from: http://www.fao.org/3/ca2079en/CA2079EN.pdf
4. Ainehvand S, Raeissi P, Ravaghi H, et al. Natural disasters and challenges toward achieving food security response in Iran. Journal of Education and Health Promotion. 2019; 8: 51.
5. The High Level Panel of Experts on Food Security and Nutrition. Food Losses and Waste in the Context of Food SYstems. 2014. Available from: http://www.fao.org/fileadmin/user_upload/hlpe/hlpe_documents/HLPE_S_and_R/HLPE_2014_Food_Losses_and_Waste_Summary_EN.pdf
6. Scott P. Global panel on agriculture and food systems for nutrition: food systems and diets:

facing the challenges of the 21st century. Food Security: The Science, Sociology and Economics of Food Production and Access to Food. 2017;9(3):653-4.
7. World Health Organization. Food and Nutrition Needs in Emergencies; World Health Organization: Geneva, Switzerland, 2004. Available from: http:// apps. who. int/ iris/ bitstream/ 10665/68660/1/a83743.pdf (accessed on 3 March 2017).
8. Ainehvand S, Raeissi P, Ravaghi H, et al. The characteristic features of emergency food in national level natural disaster response programs: A qualitative study. Journal of Education and Health Promotion. 2019; 8: 58.
9. Nakazawa T, Beppu S. Shifting from Emergency Food to Disaster Preparation Food to Help Disaster Survivors. Science and Technology Trends. 2012; 4: 36–52.
10. Sarhadi H, Sadeghizadeh-Yazdi J. The Effect of Modified Atmosphere Packaging on Physicochemical, Microbial, and Sensorial Properties of Iranian Mazafati Date. Journal of Food Quality and Hazards Control. 2019; 6 (2):73-78.
11. Lange J, Wyser Y. Recent Innovations in Barrier Technologies for Plastic Packaging – a Review. Packaging Technology and Science. 2003; 16(1):149-158.
12. Navaratne SB. Enhancement of food security through appropriate packaging to build up resilience for disasters. Procedia Engineering. 2018; 212 (1):55–60.
13. Gajdoš J, Galić K, Kurtanjek Ž, Ciković N. Gas permeability and DSC characteristics of polymers used in food packaging. Polymer Testing. 2000;20(1):49-57.
14. Pauly AS. Permeability and diffusion data. In: Brandrup J, Immergut EH, Grulke EA, editor. 4th edition. Polymer Handbook. New York: John Wiley & Sons; 1999.
15. Sadeghizadeh-yazdi J, Habibi M, Kamali AA, et al. Application of Edible and Biodegradable Starch-Based Films in Food Packaging: A Systematic Review and Meta-Analysis. Current Research in Nutrition and Food Science. 2019; 7(3): 624-637.