Editorial

iMedPub Journals
www.imedpub.com

Journal of Food Science and Toxicology

2017
Vol. 1 No. 1:2

Food Toxicity: Contamination Sources, Health Implications And Prevention

Abdul Majeed*

Department of Botany, Government Degree College Naguman Peshawar, Khyber Pakhtunkhwa, Pakistan

Received: July 06, 2017; **Accepted:** July 07, 2017; **Published:** July 12, 2017

***Corresponding author:** Abdul Majeed

majeedpsh@gmail.com

Department of Botany, Government Degree College Naguman Peshawar, Khyber Pakhtunkhwa, Pakistan.

Tel: 92 91 6224488

Citation: Majeed A (2017) Food Toxicity: Contamination Sources, Health Implications And Prevention. J Food Sci Toxicol. Vol. 1 No. 1:2

Currently, human population of the world is 7.4 billion and it is projected to reach to 9 billion by the year 2050 [1,2]. One of the major issues concerned with rapidly increasing human population is to produce sufficient and healthy food while sustaining the environment and ecosystem. It is estimated that 60% increase in global demand for food is likely to occur by the year 2050 [3]. However, every year a significant proportion of food is wasted due to contamination with microorganism, fungi and toxic chemicals they produce in addition to non-biological contaminants such as heavy metals and other hazardous chemicals [4-6]. Uncontrolled contaminants, whether biological or non-biological, often lead to food toxicity and cause several food borne diseases, thus imparting negative health effects, societal and economic disturbances [7,8]. Estimated cases of hospitalization due to food toxicity exceeds 3.2 million which results in 5000 deaths year^{-1} alone in USA [7] with more or less similar situation in other countries. Thus, there is a crucial need to address food toxicity and its consequences.

Sources of food toxicity are diverse, both biological and environmental in nature. Major biological sources of food toxicity are viral, bacterial and fungal contamination which cause different gastrointestinal disorders, predominantly diarrhoea, cholera, typhoid fever and hepatic viral diseases [9] while environmental sources include fertilizers and pesticide application and diverse chemical wastes emitting form industries which make their way to food through several means, ranging from direct pathogenic infestations to pre-harvest irrigation with contaminated water, application of fertilizers and pesticides to chemical wastes [5,10,11]. Food contamination with biological and environmental pollutants occurs through several stages of production and processing. Fresh produce is generally more vulnerable to microbial infestation during postharvest storage while grains, dairy and meat products could harbor pathogens and toxic chemicals both at pre and post-storage and processing conditions [12,13], which indicates that storage and processing conditions play an important role in food safety. Some of the most frequent pathogenic bacteria linked with food toxicity are *Salmonella* spp. and some species of *Escherichia coli* [14] which have been reported for food borne disease outbreaks while to some extents, fungal pathogen *Aspergillus flavus, Fusarium verticillioides* and other related species and their mycotoxins have been also of concerns from food safety perspective [13].

Nevell et al. [7] has identified more than 200 microorganisms and other environmental factors associated with food toxicity and related food diseases which have drastic effect on human health, generally resulting in more than 3.2 million cases of hospitalization which results in 5000 deaths year^{-1} in USA. In England and Wales, 21,997 cases of hospitalization and more than 600 deaths due to different food borne disease occur every year [15]. Similarly in Australia, 18000 cases of hospitalization with 80 deaths year^{-1} are prevalent due to diverse food borne disease, predominantly gastroenteritis [16]. In developing countries, the number episodes of food borne diarrhoea and other diseases exceed 1.5 billion with un-estimated cases of hospitalization but 5 million deaths annually [17]. Overall in the world, more than 93 million cases of Salmonella triggered food toxicity results in 1.55 million deaths year^{-1} [18]. These figures indicate that global food toxicity is a major concerns for public health and put pressure on food stake holders to assure food safety for preventing increasing cases of food borne illnesses.

Both the consumers and food producers need to crucially address the emerging threats and health issues due to food toxicity. Since, many people eat vegetables and fresh produce in raw form which serves as potential vehicles for transmission of many form of microbes [13,14] and increases the chances of food borne disease risks, thus, changes in consumption pattern might offer a safe approach in reducing risks of food toxicity. Consumption of meat and dairy products not properly processed is often associated with risk of haemolytic uremic, haemorrhagic colitis and diarrhoea [19] which could be avoided

by appropriated methods of processing and proper cooking. Use of contaminated water for irrigation of vegetables, fruits and crops and during processing of fresh produce is also considered as a source of food toxicity, this issue must be directed to have produce free from contaminants. Environmental factors, storage condition and processing techniques have great influence on the safety of food and chances of contamination; removing of dusts and other polluted sources such as insects, rodents and toxic chemicals, reducing moisture during storage and provision of adequate space [20] could have positive outcomes in reducing food contamination and associated diseases. Moreover, the application of emerging technologies such gamma irradiation and cold atmosphere packaging techniques have been widely recognized as safe alternative to chemical preservatives for food preservation and processing which have been helpful in reducing microbial infestation and decay of food products [21,22]. For a healthier life and better world, food safety is a must focused agenda for food producers, traders, policy makers and consumers, which can be attained collectively by employing hygienic practices, integrated safety measures and by the use safe food processing technologies.

References

1 Ali H, Ghori Z, Sheikh S, Gul A (2015) Effects of gamma radiation on crop production In: Crop production and global environmental Issues. Springer International Publishing, pp: 27-78.

2 Singh R, Srivastava P, Singh P, Upadhyay S, Raghubanshi A S (2016) Human overpopulation and food security: Challenges for the agriculture. Environmental Issues Surrounding Human Overpopulation 12: 13.

3 Van Kernebeek HR, Oosting SJ, Van Ittersum MK, Bikker P, De Boer IJ (2016) Saving land to feed a growing population: Consequences for consumption of crop and livestock products. Int J Life Cycle Assess 21: 677-687.

4 Ellis DI, Goodacre R (2001) Rapid and quantitative detection of the microbial spoilage of muscle foods: Current status and future trends. Trends Food Sci Technol 12: 414-424.

5 Kaushik G, Satya S, Naik SN (2009) Food processing a tool to pesticide residue dissipation–A review. Food Res Int 42: 26-40.

6 Gustavsson J, Cederberg C, Sonesson U, Van Otterdijk R, Meybeck A (2011) Global food losses and food waste. Rome: FAO, pp: 1-38.

7 Newell DG, Koopmans M, Verhoef L, Duizer E, Aidara-Kane A, et al. (2010) Food-borne diseases — the challenges of 20years ago still persist while new ones continue to emerge. Int J Food Microbiol 139: 3-15.

8 Lu Y, Song S, Wang R, Liu Z, Meng J, Sweetman A J, Wang T (2015) Impacts of soil and water pollution on food safety and health risks in China. Environ Int 77: 5-15.

9 McCabe-Sellers BJ, Beattie SE (2004) Food safety: Emerging trends in foodborne illness surveillance and prevention. J American Diet Assoc 104: 1708-1717.

10 Heaton JC, Jones K (2008) Microbial contamination of fruit and vegetables and the behavior of enteropathogens in the phyllosphere: A review. J Applied Microbiol 104: 613-626.

11 Garg VK, Suthar S, Yadav A (2012) Management of food industry waste employing vermicomposting technology. Biores Technol 126: 437-443.

12 Sivapalasingam S, Friedman CR, Cohen L, Tauxe RV (2004) Fresh produce: A growing cause of outbreaks of foodborne illness in the United States, 1973 through 1997. J Food Prot 67: 2342-2353.

13 Chulze S N (2010) Strategies to reduce mycotoxin levels in maize during storage: A review. Food Add Contam 27: 651-657.

14 Lynch MF, Tauxe RV, Hedberg CW (2009) The growing burden of foodborne outbreaks due to contaminated fresh produce: Risks and opportunities. Epidem Infec 137: 307-315.

15 Adak GK, Meakins SM, Yip H, Lopman BA, O'Brien SJ (2005) Disease risks from foods, England and Wales 1996-2000. Emerg Infec Dis 11: 365.

16 Hall G, Kirk MD, Becker N, Gregory JE, Unicomb L, Millard G (2005) Estimating foodborne gastroenteritis, Australia. Emerg Infec Dis 11: 1257.

17 Käferstein F (2003) Foodborne diseases in developing countries: Aetiology, epidemiology and strategies for prevention. Int J Environ Health Res 13: S161-S168.

18 Majowicz SE, Musto J, Scallan E, Angulo FJ, Kirk M, et al. (2010) The global burden of nontyphoidal *Salmonella gastroenteritis*. Clinic Infec Dis 50: 882-889.

19 Martin A, Beutin L (2011) Characteristics of Shiga toxin-producing *Escherichia coli* from meat and milk products of different origins and association with food producing animals as main contamination sources. Int J Food Microbiol 146: 99-104.

20 Marriott NG, Gravani RB (2006) Food contamination sources. Princ Food Sanit, pp: 76-82.

21 Duan J, Jiang Y, Cherian G, Zhao Y (2010) Effect of combined chitosan-krill oil coating and modified atmosphere packaging on the storability of cold-stored lingcod (*Ophiodon elongates*) fillets. Food Chem 122: 1035-1042.

22 Majeed A, Muhammad Z, Majid A, Shah AH, Hussain M (2014) Impact of low doses of gamma irradiation on shelf life and chemical quality of strawberry (*Fragaria* x *ananassa*) cv.'Corona'. J Animal Plant Sci 24: 1531-1536.