

# A Confront on Food and Nutrition Toxicology

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## Defining Food Pollution

The term food pollution can be used to describe any unwanted element, such as a toxic chemical or biological contaminant, found in food that is either not native to the product or at levels that are significantly greater than normal. The degree of health effects associated with exposure to food pollution can range from mild to severe illnesses, depending on the type and quantity of contaminant that was ingested. Some of the more serious health effects associated with food pollution can include cancer, hormonal and/or metabolic problems, nervous system toxicity and, in some rare cases, death.

Now a days the modern food production methods and farming is completely depends on chemical fertilizers [1] & pesticides [2], this directly causes the food toxicity, and also soil pollution. It indirectly affects decrease of soil fertility & many of the soil microorganisms are getting die, this also enter into the water bodies & pollute the water & cause the death of many aquatic organisms, those chemicals are feeded by fishes & other organisms result in toxification of food chain & nutrient cycling this is affecting the whole biosphere & leading to cancer & mutations in the genome of organisms, toxins in foods (such as plant toxins, mycotoxins, pesticides, or heavy metals) [3], first pedagogic treatment of the entire range of toxic compounds found naturally in foods or introduced by industrial contamination or food processing methods. Featuring coverage of areas of vital concern to consumers, such as toxicological implications of food adulteration (as seen in ethylene glycol in wines or the Spanish olive oil disaster) or pesticide residues.

Introduction to Food Toxicology will be of interest to students in toxicology, environmental studies, and dietetics as well as anyone interested in food sources and public health issues. The number of students who are interested in toxicology has increased dramatically in the past several years. Issues related to toxic materials have received more and more attention from the public. The issues and potential problems are reported almost daily by the mass media, including television, newspapers, and magazines. Major misunderstandings and confusion raised by those reports are generally due to lack of basic knowledge about toxicology among consumers. Basic principles of food toxicology in order to help the general public better understand the real problems of toxic materials in foods. Toxicities of chemicals found in foods Occurrence of natural toxins in plant and animal foodstuffs. Food contamination caused by industry, Toxic chemicals related to food processing, Food additives, Microbial toxins in food.

Safe food production is a vital part of providing nutrient-dense food to meet consumer demand. The production and distribution of food is a multistep system from farm to fork, with the potential for food contamination at many stages on-route. Chemical contamination from agriculture and aquaculture [4], food packaging and disinfection [5] and biological contamination [6] with pathogenic organisms represent a significant threat to public health safety. The aim of this comprehensive review was to outline such issues and the consequences of food contamination [7] for consumer health.

The extensive use of pesticides and agrochemicals in particular are an important part of agricultural systems and public health, Reports show that children are particularly at risk from foodborne pollution from chemicals such as pesticides. Even with the implementation of maximal residual levels and a ban on certain chemical pollutants [8], the risk of the disease still remains as such chemicals persist in the natural environment. Additionally, the presence of antimicrobial resistance amongst foodborne pathogens highlights the importance of preventing this route of disease transmission.

Food pollution represents a serious issue globally, as the pressure on food production systems increases to match the increasing demand for food. As such, food poisoning resulting from the ingestion of contaminated food with either chemical or biological pollutants represents a significant challenge and public safety issue. The magnitude of this threat and its implications for human morbidity and mortality is not fully understood as new issues are constantly emerging [9].

Food pollution involves the unwanted contamination of both chemical and biological substances in our food supply. It is crucial to explore the sources of food pollution in order to fully understand the potential devastating health effects that can result from ingested polluted food products.

**Plastic Pollution in Food:** In October of 2018, a small European study published their findings on 9 different plastic materials found in the feces of eight different participants. With an average of 20 microplastic particles found in each 10 grams of the participants' feces, the most commonly found plastics included polypropylene and polyethylene terephthalate within the size range of 50 to 500 micrometers. With this data in mind, the researchers behind this study estimate that more than 50% of the global population will also have microplastic concentrates present within their stool [10].

While this study was the first to publish data on microplastics



found in human stool, scientists have found microplastics in various other sample types that could easily make their way into our food products. For example, the presence of microplastics has already been found in soil, tap water, bottled water, beer and air samples in several different studies. With more than 330 million metric tons of plastic being produced each year, only 14% of which is collected for recycling purposes around the world, it is almost inevitable to expect the ability of these plastic particles to enter our food supply.

**Agriculture, Air Pollution and Food:** As the global population continues to rise at an alarmingly fast rate, the worldwide demand for agricultural output has unsurprisingly followed. In fact, between 1961 and 2014, it has been estimated that the world population increased by 136%, whereas the global production of grain and meat products rose by 188% and 345%, respectively [11]. Increased agricultural demand has led farmers to depend more on the use of industrial agro-inputs, such as synthetic fertilizers, pesticides and machinery to ensure adequate production numbers [12]. This over-dependence on both fossil fuels and chemical fertilizers has inevitably led to an increase in air pollution.

The air pollution caused by the agricultural industry encompasses a greater amount of greenhouse gas (GHG) emissions, ammonia (NH<sub>3</sub>) emission and particulate matter that now circulates the atmosphere [13]. As a result, toxic air pollutants like sulfates, nitrates, dusts and heavy metals can enter the food chain through diffusion, settling and precipitation. The contamination of these types of pollutants can not only affect plant growth and animal health but can also indirectly cause a negative impact to the food supply. For example, the frequent exposure of agricultural workers to chronic and oftentimes dangerously high levels of vehicle exhaust and pesticide residues can reduce their productivity and ultimately obstruct the food supply process.

## Conclusion

There is no doubt that environmental pollution results in harmful

effects to human, animal and ecological health. While the future of preventing contamination in our food supply may seem.

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