

*Should the discovery of new compounds in humans
surprise scientists?*

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Introduction:

Recently, scientists at the University of California discovered 109 compounds through suspect screening of about 3500 industrial chemicals on pilot data from 30 paired maternal and cord serum samples. According to the researchers, fifty-five of these compounds have not been reported in any literature and there is paucity of information about their sources or use (Aolin et al., 2021). Considering the number of chemical agents humans are exposed to today, this is an expected event. As the researchers opined, these chemicals may have been around for some time and current technology is enabling their detection.

Man depends largely on dietary supply of nutrients from plants, animals, microbes and their biotechnologically modified forms for survival. The seasonal nature of food production especially from plants, geographical distribution and the need for variety has encouraged the transportation of foods over long distances for extended periods. To retain nutritional quality and freshness, several food preservation techniques are employed, the most common being cold storage. Despite the technological advancement in freezing and refrigeration, chemical agents that act as antioxidant are usually employed to minimize oxidation in the stored food material. The improper regulation of food additives such as; antioxidants, texture, colour and aroma improvers as well as sweeteners, provides an ample opportunity for new undefined

chemicals to enter foods. More so, chemicals employed in water treatment, drugs (synthetic and herbal), cosmetics and environmental pollutants, as well as the use of herbicides, pesticides and insecticides (Aolin et al., 2021) in the food production chain further expand the opportunity for chemicals to contaminate man's food.

An extinction event of human gut bacteria was reported by Curry (2021) following the analysis of ancient DNA coprolites in Utah and Mexico. This suggests a loss of several species of gut bacteria that serve as microbial helpers which may have potentially increased the risk for metabolic diseases. (Curry, 2021). This may not be unrelated to the composition of diets and the widespread use of antibiotics today.

The effect of processing on the chemical composition of food:

The human gastrointestinal tract requires that most foods be processed and the advantages are numerous. The phases of food processing, packaging, transportation, and storage may also contribute to food contamination (Rather et al., 2017). The least considered means through which undefined chemicals can reach man is the effect of food processing. Research in this area have focused more on the advantages. For example, cooking eggs have been reported to denature conalbumin and avidin proteins that can bind iron and biotin respectively making them unavailable (Tyagi et al., 2015).

However, food processing have been reported to alter the macro- and micro- nutrients as well as phytochemical composition of foods (Lee and Labuza, 1975; Steskova *et al.*, 2006; Herbig and Renard, 2017; Ebhohimen et al 2017a; Karimian-Khosroshahi, 2021). Phytochemicals have complex organic structures that are subject to modifications when exposed to various reactions resulting in altered bioactivity (Ebhohimen et al., 2017b; Palermo et al., 2013).

Although, there are regulations on the use of herbicides, pesticides and insecticides, they are not adhered to universally especially in developing countries. Approximately 3 billion kg of pesticides is applied annually around the world (Pimentel, 2005) and minimum limits for human consumption are inconclusive (Rather et al., 2017). These chemicals bio-accumulate in food products and other chemical agents used during processing and packaging further increase chemical load. Exposure to high temperatures during processing leads to the formation of toxic compounds such as nitrosamines, chloropropanols, acrylamide, furanes, and polyaromatic hydrocarbons (Nerín et al., 2016). The effect is worse when the thermal treatment occur in the absence of water such as frying (Roccatto et al., 2015). Also, microwaving food packaging materials along with food can cause a transfer of the components of these materials to food (Nerín et al., 2003; Ehlert et al., 2008).

Conclusion:

Scientists must pay close attention and understudy the possible chemical reactions that occur between food nutrients, phytochemicals and chemical contaminants that bio-accumulate in foods. It is also important to study structural modifications and the type of new compounds formed during food processing. Expanded suspect studies should be conducted taking into consideration specific parameters that will enable useful outcomes.

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