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Nudity is Nothing to be Ashamed of

Chemical contamination and its effect on food quality and human health

For centuries, humanity have stored their nourishment in vessels provided by nature – shells, logs, leaves, weaved baskets and pottery. Since its' origin, the science of food packaging has evolved to an unprecedented level. Today, products are often bundled in multiple layers of packaging to transport them efficiently from the site of manufacture to the outstretched hands of consumers, enthused by affordable convenience. Packaging allows for economical food transportation, increased microbial contamination prevention, as well as enhanced product quality and shelf life. However, there are many chemicals within packaging materials that are actively defying boundaries. Chemicals that are 'drifting', without invitation, into our food, negatively effecting food quality and potentially endangering human health. Just how tasty is that?

It is well known that chemical components from packaging have the potential to migrate into foods, however the statistics surrounding just how much movement takes place is attaining more attention from researchers. Interestingly, glass is considered safe by the FDA when used as a container for holding food^a. However, research has shown that some glass bottles have the capacity to 'leach' lead and possibly other heavy metals, via contact, into food matter^a. German researchers, from the Environmental Geochemistry Institute, assessed 125 brands of drinking water, from 28 countries, and found that water packaged in glass containers contained 26-57 times more lead in comparison to water bottled in polyethylene terephthalate plastic (PET)^b. This dramatic increase in the presence of lead, appears to be consistent with the migration of lead particles from glass containers. Furthermore, environmental concerns associated with the use of paper food packaging have focused on the use of recycled paper materials. Inks from earlier manifestations of the paper can be trapped within the material and have the potential to 'wander' into food, exposing human tissue and organs to phthalates and benzophenones as well as other suspected endocrine-disrupting 'immigrants'^a. Additionally, complications have also been discovered with liners used in some paper boxes. In 2010, Kellogg recalled 28 million cereal cartons because of elevated levels of methylnaphthalene-16, a toxic oxidizing agent, that had seeped from the coated paper lining^a. Although the hazards surrounding ingestion of this compound are not well understood, at least five consumers reportedly became ill after eating the contaminated cereal^a. Moreover, chemicals classified as 'toxicants' by the FDA, have been traced in numerous food packaging materials. For example, several types of asbestos are authorised as 'indirect' food additives for use in rubber jar seals^b. Additionally, perfluorooctanoic acid (PFOA), a known endocrine disrupter and carcinogen, is streaked upon greaseproof paper wrappers, further 'seasoning' our food^b.

Though chemical migration can occur from materials like stainless steel, glass or paper, it is significantly more likely to occur from our comrade of convenience, plastic^c. Substances employed to ensure material flexibility often migrate from this material, attracting petroleum-based toxins^d. The most notable example bisphenol A (BPA), a chemical used in the creation of polycarbonate plastics and epoxy resins, is employed to prevent metal from corroding^e.

The incomplete polymerisation process of BPA causes monomer residues to migrate into food during storage and processing at extreme temperatures^f. A 2008 U.S. Toxicology Program released a BPA toxicity review expressing ‘some concern’ that the compound may adversely affect the brain and prostate gland at exposure levels traced throughout the general population^a. It seems that this concern is most certainly called for. The oestrogen-like shape of BPA allows these particles to bind to oestrogen receptors and influence bodily processes including: growth, cell repair, foetal development and metabolism. Further, exposure to BPA via food intake is highly disturbing, as this route of exposure affects a great magnitude of people. Ingestion over extended periods of time, in trace amounts, escapes detection and consequently, makes related health concerns difficult to isolate and control^g. In another 2008 study, Canadian Total Diet analysed 154 composite samples. BPA was found in at least 55 compounds with concentrations fluctuating between 0.20 and 106.00 ng/g, with preserved canned foods demonstrating a higher BPA concentration in comparison to less heavily packaged foods^d. Well, why not go BPA-free? Unfortunately, it seems that it’s all too easy for manufacturers to print a plastic ‘BPA-free’ sticker upon their product and welcome the related BPS or BPF to the family, which, extraordinarily, are equally as hazardous.

The chemical contamination of food via the migration of packaging chemicals, has provided evidence to suggest that prolonged, low-dose exposure to these substances has the potential to cause disturbing health effects. Chemical risk assessments assume that there is a threshold for exposure to an individual chemical when its’ toxicity is considered unproblematic^c. In parts of Europe, chemical migration for packaging into food <10 ppb is not considered toxicologically or clinically relevant^c. However, humans are never just exposed to single chemicals in isolation. The compounds migrating from packaging into our food are difficult to detect due to their size and behavioural properties. Koni Grob of Switzerland Food Control, states, “While pesticides are thoroughly evaluated and well controlled, only a small fraction of substances migrating from food packaging have been evaluated and majority haven’t even been identified”^a. Consequently, establishing a relationship between lifelong exposure to food packaging chemicals and chronic human diseases is challenging - not only because of a lack of public information and regulation, but also due to the fact that no experimental populations are completely unexposed to synthetic food packaging chemicals or ingest the same quantities of these chemicals throughout their lifetime^b.

Ultimately, chemical contamination from food packaging, which dresses an array of products on our supermarket shelves, has and will continue to affect us. However, given the diversity of sources and quantity of these ‘artificial flavours’ in our current diet, we can only estimate the nature and extent of silent damage these crafty ‘travellers’ are instigating. As an alternative to compromising food quality, should we be committing to plain, undressed nutrition? Perhaps, when it comes to our food and the sake of our health, nudity really is nothing to be ashamed of.

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Endnotes:

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^e Author Unknown (N.D.), Healthline: *What is BPA?* Accessed 18.08.2019 from:

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