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## Pervasive plastic : from food in plastic to plastic in food

Over the last five decades, the development of plastic has been extraordinary. Paper bags, porcelain plates and glass jars used decades ago by our close ancestors have been rapidly replaced by plastic boxes for the containment of food, disposable plates and plastic wrappings. Moreover, plastic has also increasingly become a component of personal care products such as toothpastes, shampoos and cosmetics, not to mention cotton-tipped swabs [[read](#)]. It is also present in a quasi infinite number of industrial products.

Plastic consists of different polymers produced from petroleum by the chemical industry. It is cheap, convenient to use and that is the reason why it has become so popular. In 2016, total plastic production was estimated to be around 335 million tonnes [[read](#)].

For decades, our food has been increasingly contained in plastic; *now it is plastic that is pervasively contained in our food...* and, consequently, it will soon be extensively present in our bodies.

The problem with the huge quantity of plastic that we produce and use every year is that it does not vanish when we don't need it any more. It does not even vanish when it seems to degrade: it just takes new shapes.



If it is burnt - and it is often very difficult to burn it as many types of plastics prefer to melt - it creates toxic fumes. Some of the plastic - not all - can be recycled (currently around 5% of the total plastic is being collected and recycled) and reshaped into new plastic items.

The bulk of non recycled plastic (approximately 8 million tonnes annually) ends up in the water where some of it sinks to line the sea bed. For the rest, it slowly degrades into micro-sized or potentially even nano-sized fibres or particles that remain in suspension in the water. The Great Pacific Garbage Patch described as early as in 1988 is no exception and plastic is now present everywhere in the sea, in the Mediterranean sea, in the Indian Ocean, in the Atlantic Ocean even up to the Greenland neighbourhood. It has now arrived everywhere: it pollutes coastal sediments, creates huge floating plastic continents and is ingested by the marine fauna. And, later, we eat fish and other sea products, along with the plastic they contain. Estimates are that we consume every year around 110 million tons of fisheries and aquaculture products.

Yes, the marine fauna eats plastic just as the cows I was observing back in September 1975 in Tunisia were eating plastic bags because they had nothing else to chew. There are hundreds of stories of what happens to animals who take plastic for their usual food, of fish or whales confusing plastic with jellyfish or plankton that come and die on a beach with their stomach full of plastic bags [\[read in French\]](#).

Recently, scientists from the University of Hull and the Brunel University London collected samples from locations around the UK's coastline between November 2016 and February 2017 as well as from different brands of seafood sold in British supermarkets. They found that:

- **All** samples taken from UK waters and supermarket-bought products contained micro-plastic or other debris;
- In every 100g of mussels consumed, it is estimated there are approximately 70 pieces of micro-plastic;
- More particles were found in supermarket mussels which had been cooked or frozen, than in the freshly caught mussels. [\[read\]](#)

« *Bon appétit!* ».

Studies in other countries (e.g. the [US](#) or Canada) have had similar findings, including in fresh waters and in the great North-American lakes. In some cases, plastic found in animals was primary - they had eaten it themselves -, in other it was secondary - they had eaten animals that contained plastic. Studies also note that plastic is often associated to other chemicals that may be dangerous.

So far, there is only limited data on the impact of plastic on health of the marine fauna, and even less on what happens to us when we consume plastic found in seafood. Some evidence was however gathered, for example, on the negative effect of plastic on reproduction and growth of crustaceans. The presence of plastic may also change the composition of the marine fauna and it can be associated to a proliferation of certain bacteria. As for us, initial evidence suggests that eating plastic, particularly in the shape of micro or nano-plastic is likely to be bad for our health. Let's not forget that there is good evidence that nano-elements migrate quite freely within our body. But more research is needed to improve our knowledge.

Little has been done so far to limit the use of plastic. A few countries have banned the use of plastic bags and the European Union has specific regulations on the type of plastic that is allowed to be in contact with food [[read](#)]. But this seems quite insufficient given the size of the problem and sometimes measures that seem logical are turned down by policy makers, such as the ban of plastic containers in French school cafeterias [[read in French](#)].

Each and every one of us, at our level, we have to try and limit the use of plastic and ensure that we recycle the largest possible share of whatever plastic we use while avoiding to ever throw plastic in the environment, a plastic that will end up first in the water, then in water products and, ultimately, in our bodies with very likely negative consequences.

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To know more :

- University of Hull, Significant and widespread microplastics found in mussels from UK waters, 2018.
- Robertson R., Are Microplastics in Food a Threat to Your Health? Healthline, 2018.
- Schaub, C., Plongée dans l'océan plastique, Libération, 2017 (in French only).
- Anderson, J.C. *et al.*, Microplastics in aquatic environments: Implications for Canadian ecosystems, Environmental Pollution, Volume 218, November 2016, Pages 269-280.
- Gruber, K., Plastic in the food chain: Artificial debris found in fish, New Scientist, 2015.

Earlier articles on [hungerexplained.org](http://hungerexplained.org) related to the topic:

- Seafood and tobacco blamed for being responsible for the high level of metal contamination of pregnant women in France, 2017
- Food-Health nexus: priority to public interest, independent research and reshaped power balance are indispensable ingredients for reengineering our food systems and make them healthier, 2017
- Food, Environment and Health, 2014/2017.