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Food additives – are we better off safe than sorry?

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Several animal studies suggest that certain additives used by the food processing industry may have an adverse metabolic effect and impact negatively on immune response functions. These effects appear to originate from changes to the intestinal flora. The use of such food additives is therefore a potential health hazard for human beings.

Texturing agents are a group of food additives that have the capacity to improve and preserve the texture of processed foods. They can work as emulsifiers (enabling water to mix with oil/fat), or as thickening, gelling or stabilising agents, or they can combine all of the above. Texturing agents are found in many staple products readily available in Norwegian supermarkets, e.g. bread and other baked goods, tortilla wraps, dairy produce, ice cream, cold meats, bacon, coconut milk and sauces. Several studies now suggest that some texturing agents may affect the intestinal flora and cause disease in test animals.

The first study to suggest that the emulsifier carboxymethyl cellulose (E466) may cause intestinal inflammation in mice, was published in 2009 (1). In 2015, another study showed that carboxymethyl cellulose and polysorbate 80 (E433) caused obesity and metabolic syndrome in mice (2). The researchers were able to show that the harmful effects were caused by changes to the intestinal flora and that the texturing agents increased the bacteria's ability to cause inflammation in the host (3, 4). A study from 2017 suggested a worrying consequence of such inflammation over time, in the form of an increased incidence of bowel cancer in mice (5). These effects were found even at low doses that were meant to reflect a normal intake of foods produced with such additives.

In our opinion, the evidence base that is currently available calls for a stricter application of the precautionary principle of 'better safe than sorry'

Several texturing agents have proved to be linked with a negative effect on the intestinal flora and therefore the host. A study of monolaurin, a compound that (in unknown

proportions) may form a constituent of mono- and diglycerides of fatty acids (E471), showed a change to the intestinal flora that led to increased inflammation as well as metabolic syndrome in mice (6). Studies on the effect of carrageenans (E407) added to the feed of guinea pigs, rabbits, mice and rats have shown changes to the intestinal flora followed by intestinal inflammation (7). According to a human study from 2017, exposure to carrageenan, even at lower levels than through normal food intake, triggered a relapse of active disease in people with inflammatory bowel disease. When carrageenan was removed from the diet, none of the participants suffered a relapse for the duration of the one-year study period (8).

Based on today's knowledge, there are alternatives that appear to be safer. Lecithin (E322), an emulsifying fatty substance, has been shown to repair the intestinal barrier in humans and has a beneficial effect on ulcerative colitis (9).

What do we do while there is doubt?

We believe that food cannot be regarded as safe if it is produced with additives that may cause growth advantages or increased virulence in (opportunistic) pathogenic micro-organisms in the host's gut. The contradictory effects of different types of texturing agent emphasise the stricter application of the precautionary principle. The European Food Safety need for each individual additive to be tested for its effect on the intestinal flora prior to approval.

In our opinion, the evidence base that is currently available calls for a stricter application of the precautionary principle. The European Food Safety Authority has recently carried out a new risk assessment of all texturing agents approved for use in food manufacturing, and according to the report, the panel of experts were familiar with several of the animal studies that have shown negative effects after exposure to such agents. Nevertheless, no further research in this area has been sought, and no interventions have been proposed (10). It is a paradox that animal studies are deemed good enough for conducting risk assessments prior to approval, but not for taking action when harmful effects have been documented.

The first human study to test the effect of carboxymethyl cellulose has commenced (11). In the meantime, the best solution appears to be to avoid products that contain the emulsifiers that have proved harmful to test animals.

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