High intake of several emulsifier E numbers linked to increased cardiovascular disease risk

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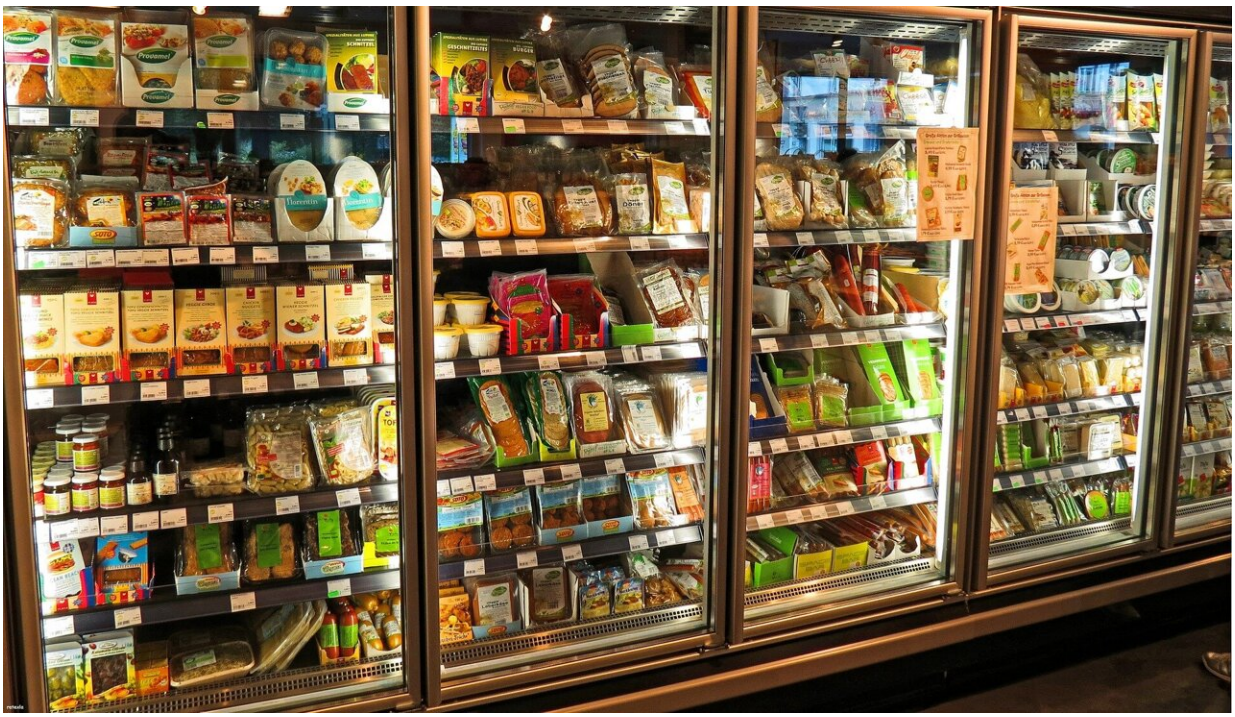

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High intake of several emulsifiers (part of the "E numbers" group of food additives), widely used in industrially processed foods to improve texture and extend shelf-life, is associated with increased risk of cardiovascular disease (CVD), suggests a study published by *The BMJ*

today.

Given that these food additives are used ubiquitously in thousands of widely consumed ultra-processed food products, these findings have important public health implications, say the researchers.

Emulsifiers are often added to processed and packaged foods such as pastries, cakes, ice cream, desserts, chocolate, bread, margarine and ready meals, to enhance their appearance, taste, texture and shelf life. They include celluloses, mono- and diglycerides of fatty acids, modified starches, lecithins, carrageenans (derived from red seaweed; used to thicken foods), phosphates, gums and pectins.

As with all food additives, the safety of emulsifiers is regularly assessed based on the available scientific evidence, yet some recent research suggests that emulsifiers can disrupt gut bacteria and increase inflammation, leading to potentially increased susceptibility to cardiovascular problems.

To explore this further, researchers in France set out to assess the associations between exposure to emulsifiers and risk of cardiovascular disease, including coronary heart disease and cerebrovascular disease —conditions affecting blood flow and blood vessels in the heart and brain.

Their findings are based on 95,442 French adults (average age 43 years; 79% women) with no history of heart disease who were taking part in the NutriNet-Santé cohort study between 2009 and 2021.

During the first two years of follow-up, participants completed at least three (and up to 21) 24-hour online dietary records. Each food and beverage item consumed was then matched at the brand level against three databases to identify the presence and the dose of any food

additive. Laboratory tests were also performed to provide quantitative data.

Participants were also asked to report any major CVD event, such as a heart attack or stroke, which were validated by an expert committee after reviewing the participants' medical records.

Deaths linked to CVD were also recorded using the French national death register, and several well known risk factors for heart disease including age, sex, weight (BMI), educational level, family history, smoking status, physical activity levels, and diet quality (e.g., sugar, salt, energy, alcohol intakes) were taken into account.

After an average follow-up of 7 years, higher intake of total celluloses (E460-E468), cellulose (E460) and carboxymethylcellulose (E466) were found to be positively associated with higher risks of CVD and specifically coronary heart disease.

Higher intakes of monoglycerides and diglycerides of fatty acids (E471 and E472) were associated with higher risks of all studied outcomes. Among these emulsifiers, lactic ester of monoglycerides and diglycerides of fatty acids (E472b) was associated with higher risks of CVD and cerebrovascular diseases, and citric acid ester of monoglycerides and diglycerides of fatty acids (E472c) was associated with higher risks of CVD and coronary heart disease.

High intake of trisodium phosphate (E339) was also associated with an increased risk of coronary heart disease.

There was no evidence of an association between the other studied emulsifiers and any of the cardiovascular outcomes.

This is a single observational study, so can't establish cause, and the

researchers acknowledge some study limitations. For example, the high proportion of women, higher educational background, and overall more health conscious behaviors among the NutriNet-Santé study participants compared with the general French population, may limit the generalizability of the results.

Nevertheless, the study sample was large and they were able to adjust for a wide range of potentially influential factors, while using unique detailed brand-specific data on food additives. What's more, the results were unchanged after further testing, suggesting that they are robust.

The authors stress that these results need replication in other large scale studies, but say they could "contribute to the re-evaluation of regulations around food additive usage in the food industry to protect consumers."

"Meanwhile, several public health authorities recommend limiting the consumption of ultra-processed foods as a way of limiting exposure to non-essential controversial food additives," they add.

More information: Research: Food additive emulsifiers and risk of cardiovascular disease in the NutriNet-Santé cohort: prospective cohort study, *The BMJ* (2023). DOI: 10.1136/bmj-2023-076058

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