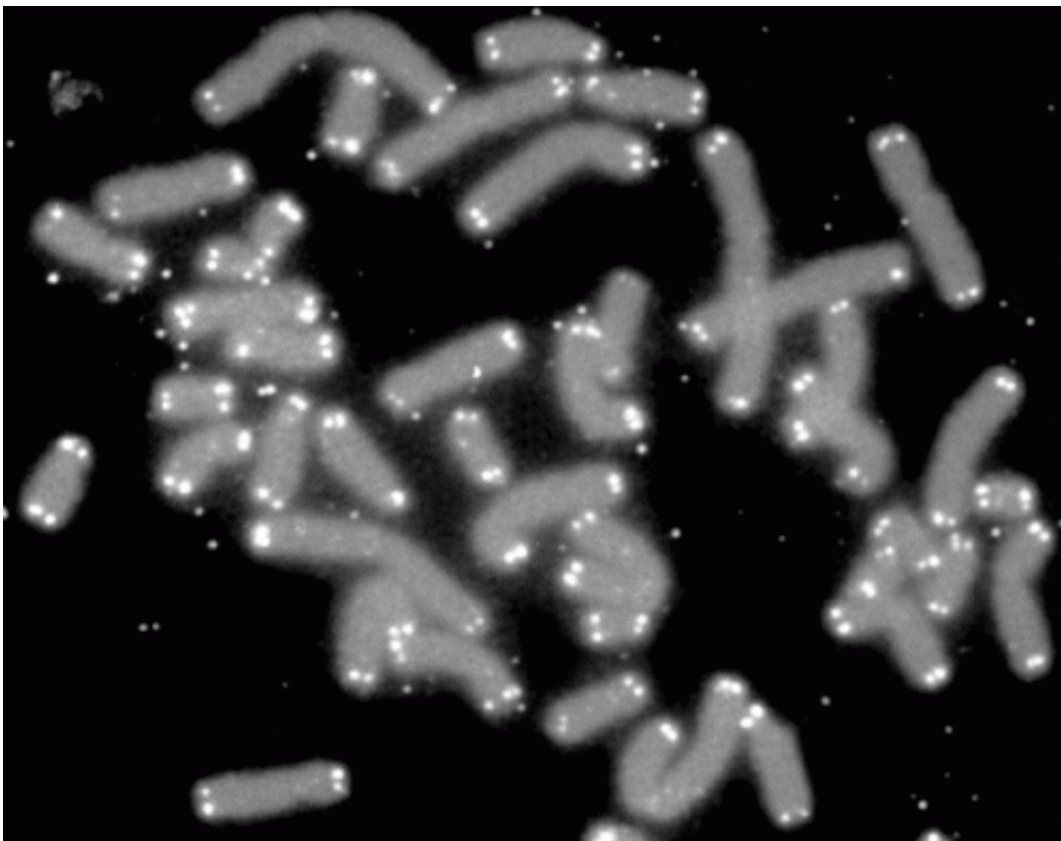


# Ultra-processed food consumption is associated with chromosomal changes linked to biological ageing

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Human chromosomes (grey) capped by telomeres (white). Credit: PD-NASA; PD-USGOV-NASA

A new study has shed light on the link between the consumption of ultra-processed foods (UPF) and the shortening of telomeres; sections of

chromosomes that can be used as a marker of biological age. The work was conducted by Lucia Alonso-Pedrero and colleagues with the supervision of Professor Maira Bes-Rastrollo and Professor Amelia Marti, University of Navarra, Pamplona, Spain.

The research, being presented at this year's European and International Conference on Obesity (ECOICO 2020), held online this year (1-4 September), indicates that telomeres were twice as likely to be short in individuals who had a high [consumption](#) (more than 3 servings per day) of UPFs. Short telomeres are a marker of biological ageing at the [cellular level](#), and the study suggests that diet may be causing the cells to age faster.

Telomeres are structures formed from a strand of DNA together with specialised proteins, and which are located at the ends of the chromosomes. Each human cell has 23 pairs of chromosomes that contain our [genetic code](#), and while the telomeres do not contain genetic information themselves, they are vital for preserving the stability and integrity of chromosomes and by extension, the DNA that every cell in our body relies on to function. As we get older, our telomeres get shorter since each time a cell divides, part of the telomere is lost, thus telomere length (TL) is considered to be a marker of biological age.

Worldwide, fresh food consumption is decreasing while UPF intake is rising. UPFs are industrial formulations of food-derived substances (oils, fats, sugars, starch, protein isolates) that contain little or no whole food and often include flavourings, colourings, emulsifiers, and other cosmetic additives. The processes and ingredients used in the manufacturing of UPFs make them highly convenient (ready-to-consume, almost imperishable), highly attractive for consumers, and highly profitable (low cost ingredients, long shelf-life) for their manufacturers. These properties also result in them being nutritionally poor or unbalanced, and liable to be over-consumed, often at the expense

of less processed and more nutritious alternatives.

Research has associated UPFs with serious diseases including hypertension, obesity, metabolic syndrome, depression, type 2 diabetes, and various cancers. These conditions are often age-related and are linked to oxidative stress, inflammation, and cellular ageing which can also influence TL. Despite this, there have been few studies into the effects of UPF consumption on TL, but those that have been conducted found associations between the intake of sugar-sweetened beverages (SSBs), alcohol, processed meats and other foods rich in saturated fats and sugar with having shorter telomeres. These studies are far from conclusive however, as other research has not shown a link between UPF and TL.

The authors objective was to evaluate the association between UPF consumption and the risk of TL within an elderly study population using the NOVA system method for classifying the degree of processing of different foods.

Data were obtained from participants in the SUN Project: an open prospective cohort of graduates from the University of Navarra and other Spanish universities. Recruitment began in 1999 and is permanently open to any graduate age 20 years old or more, with data collection being done via self-reported questionnaires mailed out every 2 years. This research is based on the analysis of a genetic study performed in May 2008 which all SUN Project participants over the age of 55 were invited to take part. In total, 886 individuals provided saliva samples for DNA analysis as well as accurate records of their daily food intake.

In total 645 men and 241 women with an average age of 67.7 years were included in the analysis and were grouped into 4 groups of equal size (quartiles) from 'low' to 'high' based on their UPF consumption: less than

2 servings/day, 2 to 2.5 servings/day, more than 2.5 to 3 servings/day, and more than 3 servings/day.

Those in the 'high' quartile were more likely to have family history of cardiovascular disease (CVD), diabetes, and abnormal blood fats, and to snack more in between meals. They also consumed more fats, saturated fats, polyunsaturated fats, sodium, cholesterol, SSBs, [fast food](#), and processed meats while consuming less carbohydrates, protein, fibre, olive oil, fruits, vegetables, and other micronutrients. Participants who ate more UPFs were observed to be less likely to adhere to the 'Mediterranean diet' which has been linked to improved general health, and in particular a reduced risk of CVD.

The team found that as UPF consumption increased, the likelihood of having shortened telomeres rose dramatically with each quartile above the lowest having a risk increase of 29%, 40%, and 82% for the 'medium-low', 'medium-high', and 'high' UPF consumption groups respectively. The authors also found that UPF intake was associated with the risk of depression (especially in patients with low levels of physical activity), hypertension, overweight/obesity, and all-cause mortality.

The authors conclude: "In this cross-sectional study of elderly Spanish subjects we showed a robust strong association between ultra-processed food consumption and [telomere](#) length. Further research in larger longitudinal studies with baseline and repeated measures of TL is needed to confirm these observations."

**More information:** [academic.oup.com/ajcn/article-abstract/100/1/100/100](https://academic.oup.com/ajcn/article-abstract/100/1/100/100)  
[irectedFrom=fulltext](#)

Provided by European Association for the Study of Obesity

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