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**Prebiotic diet changes neural correlates of food decision-making in overweight adults**

Medawar E, Beyer F, Thieleking R, et al. [Prebiotic diet changes neural correlates of food decision-making in overweight adults: a randomised controlled within-subject cross-over trial](https://gut.bmj.com/content/73/2/298). Gut 2024; 73(2):298-310. doi: 10.1136/gutjnl-2023-330365.

Targeting food decision-making and unhealthy eating behaviour is important for management of the worldwide obesity pandemic. The gut microbiome has been shown to modify feeding behaviour through improvements in microbiome-gut-brain communication. However, neuroimaging correlates of how prebiotic diet affects the feeding behaviour remains unknown.

In this study, Medawar et al., tested the effects of high-dosed prebiotic fibre intervention on the gut microbiome and neural activation patterns of food decision making in a randomized within-subject cross-over study. 59 overweight adults underwent functional task MRI (fMRI) before and after 14 days of daily 30 g supplementary intake of inulin (prebiotic fibre) and equicaloric placebo, respectively. Gut microbiota and metabolic mediators of potential effects were assayed.

The results showed that 14 days of high-dose dietary prebiotics, compared with placebo, led to decreases in brain activation towards high-caloric wanted food stimuli in the ventral tegmental area and right orbitofrontal cortex. In addition, prebiotics induced significant shifts in relative abundance of the gut microbiota, including increases in short-chain fatty acid (SCFA) producers such as Bifidobacteria, and changes in functional signalling pathways. Exploratory analysis indicated that changes in brain activation correlated with intervention- induced changes in relative microbial abundance and predicted metabolic pathways. Prebiotics-induced decreases in brain activation related to decreases in fasting PYY (Peptide YY) while fasting gut hormones, inflammatory markers and SCFA in blood and faeces remained unchanged.

In summary, the results of this study suggest the role of prebiotics-induced reduction of reward-related brain activation in response to high-caloric food stimuli with potential implications for food craving and decision making.