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Appetite suppression through smelling of dark chocolate correlates with changes in ghrelin in young women.

Massolt ET[1], van Haard PM, Rehfeld JF, Posthuma EF, van der Veer E, Schweitzer DH.

Author information

[1]Dept. of Internal Medicine, Reinier de Graaf Group of Hospitals, Delft, The Netherlands.

Abstract

Cephalic effects on appetite are mediated by vagal tone and altered gastrointestinal hormones. The objective of this study is to explore the relationship between appetite and levels of gastrointestinal hormones after smelling chocolate and after melt-and-swallow 30 g chocolate (1.059 oz, 85% cocoa, 12.5 g of sugar per 100g product). Twelve female residents (BMI between 18 and 25 kg/m(2)) all participated in two 60-minute study sessions. In the first session, all 12 women ate chocolate; for the second session, they were randomized either to smell chocolate (n=6) or to serve as a control (no eating or smelling; n=6). At the start of the sessions, levels of insulin, glucagon-like peptide-1 (GLP-1) and cholecystokinin (CCK), but not glucose, correlated with appetite scored on a visual analogue scale (VAS). In contrast, ghrelin levels correlated inversely with scored appetite. Chocolate eating and smelling both induced a similar appetite suppression with a disappearance of correlations between VAS scores and insulin, GLP-1 and CCK levels. However, while the correlation between VAS score and ghrelin disappeared completely after chocolate eating, it reversed after chocolate smelling, that is, olfactory stimulation with dark chocolate (85%) resulted in a satiation response that correlated inversely with ghrelin levels.

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