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## The role of food reward during weight management – a systematic review

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Increasing obesity rates have necessitated a multidimensional approach to the investigation of weight management<sup>(1)</sup>. Although it is well known that food intake is modulated by the interaction between homeostatic and hedonic appetite systems, the role of changes in food reward (FR) during weight management has not been systematically reviewed<sup>(2,3)</sup>. The aim of this systematic review was to examine the role of FR in the long-term and its relationship to weight management outcomes.

A systematic review (registration number: CRD42017081209) was performed following PRISMA guidelines to assess interventions that measured a change in food reward during weight management. The search was run on four databases: Medline, Embase, PsycInfo and Cochrane Library. Articles were included if they involved long-term interventions in healthy adults with overweight or obesity. The primary outcome was food reward changes pre to post intervention and secondary outcomes were associations with changes in food intake and physiological factors.

Of 239 full-text articles assessed, 16 long-term studies met the inclusion criteria. Five types of interventions emerged from the search: diet, behaviour, exercise, pharmaceutical and cognitive interventions. Ten studies were randomised controlled trials and 3 studies had no control group. The duration of studies ranged from 4 weeks to 2 years with a median of 12 weeks. Two components of FR were measured: liking and wanting and a diversity of methods were used to measure each of these concepts.

Eleven studies reported a significant change in at least one component of FR over time. Liking for high energy-dense food was the most reported. From 12 studies, it decreased in 7 studies with a median of 15 % (based on 3 studies) but increased by 9 % in one study (with no control group). Five studies showed an effect of a long term intervention (diet, pharmaceutical, behavioural and cognitive) on the decrease of liking. Among the 6 studies that measured wanting, wanting for high energy-dense food decreased in 3 studies and wanting for low energy-dense food increased in 2 studies. Two studies showed an effect of the intervention (pharmaceutical and cognitive) in decreasing both liking and wanting compared to the control group. Few studies have analysed the relationship between changes in FR and changes in food intake or physiological factors. Only one study reported a positive relationship between a decrease in wanting for high energy-dense food and decrease in the intake of this food and two studies reported an association between decrease in liking for high energy-dense food and a greater body weight or fat mass loss. Methodological differences between interventions need to be taken into account to understand potential mechanisms.

To conclude, a systematic review of the literature showed that dietary, pharmaceutical, behavioural and cognitive interventions were efficient in decreasing liking and/or wanting for high energy-dense food, supporting the possibility that components of FR could be feasible targets for weight management. However, few studies have assessed the relationship between components of FR and weight management outcomes. More interventions targeting the hedonic aspect of food intake, especially wanting, are needed to gain new insights in weight management.

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2. Berthoud HR, Munzberg H *et al.* (2017) *Gastroenterology* **152**(7), 1728–38.
3. Hopkins M, Blundell J *et al.* (2016) *Endotext*. South Dartmouth (MA): MDText.com, Inc.