Introduction

- People consume foods they like, or enjoy: the high-fat and high-sugar foods typically consumed could lead to obesity.¹
- While liking and wanting are key factors in food choice², it is proposed that liking is not enough to drive food choice. Wanting is also critical.³
- In humans, obesity is characterized by greater wanting, but no differences in liking.⁴
- However, in rodents, development of obesity altered both liking and wanting.⁵
- An investigation of the role of diet on liking found that a junk-food diet did not alter the liking of sugar in Sprague Dawley rats. However, junk-food fed rats who gained weight showed reduced liking.⁶
- The current study aimed to determine the effect of long-term exposure to high-fat (HF) and high-sugar (HS) diets on dietary preferences and the wanting and liking of fat and sugar.

Methods

Subjects: 36 Male Sprague-Dawley rats
Diet manipulation (all groups had access to the same number of calories per day):
- HF: 60% rat chow and 40% Crisco
- HS: 60% rat chow and 40% powdered sugar icing
- C: 100% rat chow

Devaluation Task
- Satiation: Rats were satiated on one type (fat or sugar) of pellet
- Choice Task: Rats were given a non-reinforced choice between a previously fat-associated lever and a previously sugar-associated lever

Preference Task
- Exposure (Test 1): Rats had access to 1 g of sugar (powdered sugar) and 1 g of fat (Crisco) for 10 min
- Testing (Test 2-3): Rats had access to 3 g sugar (powdered sugar) and 3 g fat (Crisco) for 1 min

Taste Reactivity Task
- 1 mL of sucrose and corn oil solutions were infused into the mouth of the rodent through an intraoral fistula over 1 min. The proportion of time the rats spent performing hedonic (liking) responses in 60 s was measured
  - Sucrose concentrations: 0.01 M, 0.1 M, 1 M
  - Corn oil concentrations: 0.06%, 1%, 32%

Discussion

- Groups HF and HS showed lower overall incentive motivation to work for food in the devaluation task, but showed intact devaluation.
- While Group HF showed a preference for fat in the preference test, Group HS did not show enhanced preference for sugar in comparison to Group C. This suggests the strong innate preference for sugar may be difficult to amplify.
- Groups HF and HS did not differ significantly from Group C in their liking of sucrose, which may suggest that other factors, such as wanting, play a bigger role in the overconsumption of unhealthy foods.
- Long-term exposure to diets high in fat and sugar impaired incentive motivation and altered food preferences, both of which could cause potential challenges for behavioral interventions needed to treat obesity.

References

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