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Habitual sweet food intake and eating behaviour are influenced by sweet taste perception

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Abstract

Background: Sugar consumption creates pleasure, and excessive sugar consumption leads to weight gain and is therefore a key driver of obesity. This study aims to assess sweet food and beverage intake, eating behaviours and how they may be explained by perceived sweet taste intensity and hedonic preference.

Aim: To assess sweet food habits and eating behaviours in 20-40-year-old NZ European women, and understand how measures of sweet taste perception can help explain these sweet food choices and eating behaviours.

Methods: Women (N=45), aged 20-40 years, were recruited for this cross-sectional study. A non-quantitative sweet food-frequency questionnaire (SF-FFQ) was developed to assess sweet food intake. Liking of sweetened beverages was assessed on a 100 mm visual scale. The Three Factor Eating Questionnaire (TFEQ) was used to assess the eating behaviours. Perceived sweet taste intensity and hedonic preference of glucose concentrations (125 mM, 250 mM, 500 mM, 1000 mM) was rated (0-100) on a modified general Labelled Magnitude Scale (gLMS).

Results: Frequency of daily intake was reported as daily frequency equivalents (DFE). Occasional sweet food DFE was high (4.23 ± 2.29), with intake of baking and sweets especially high (1.20 ± 0.83). Participants with a self-reported “sweet tooth” more frequently consumed baking ($P=0.04$), chocolate ($P=0.03$) and soft lollies ($P=0.04$) compared to participants with no “sweet tooth”. Chocolate DFE was higher in participants who experienced regular food cravings compared to those who did not ($P<0.001$). Higher consumption of sweet food was correlated with less sensitivity to 1000 mM glucose ($P=0.02$). A negative correlation was found between intensity rating (1000 mM), fruit juice liking ($P=0.01$) and fruit drink liking ($P<0.001$). Participants who preferred sweet snacks, were less sensitive to 1000 mM glucose than those who preferred savoury ($P=0.04$).

Conclusion: Participants in this study habitually consumed foods high in sugar such as baking, sweets, chocolate and sweetened beverages. The participants’ sweet beverage choice was influenced by their liking of sweet beverages. Some participants were

found to express certain eating behaviours that influenced their intake of sweet food such as hunger, food cravings and “sweet tooth”. Sensitivity to sweet taste was inversely associated with consumption of sweet tasting food. The data suggest that sweet taste intensity perception plays an important role in habitual sweet food and beverage intake.

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Abbreviation List

BF%	Body Fat Percentage
BIA	Bioelectrical Impedance Analysis
BMI	Body Mass Index
CI	Confidence Interval
FFQ	Food Frequency Questionnaire
gLMS	general Labelled Magnitude Scale
MSG	Monosodium Glutamate
MU	Massey University
NZ	New Zealand
OECD	Organisation for Economic Cooperation and Development
P	p-value (statistical analysis)
PROP	6-n-propylthiouracil
PTC	Phenylthiocarbamide
<i>r</i>	Correlation coefficient (statistical analysis)
SD	Standard Deviation
SF-FFQ	Sweet Food- Food Frequency Questionnaire
T2DM	Type 2 Diabetes Mellitus
T2R	Type 2 Receptor
TFEQ	Three Factor Eating Questionnaire
USA	United States of America
VAS	Visual Analogue Scale
VLDL	Very Low Density Lipoprotein
WHO	World Health Organisation