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-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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# Table of Contents

Abstract .............................................................................................................................. i

Acknowledgements .......................................................................................................... iii

List of Tables .................................................................................................................... ix

List of Appendices .......................................................................................................... xii

Abbreviation List ............................................................................................................. xiii

Chapter One Introduction ................................................................................................. 1

1.1 Background and Study Justification ........................................................................ 1

1.1.1 The link between excessive sugar consumption and obesity .......................... 1

1.1.2 The important influence of sensory attributes on food selection ............... 2

1.1.3 Dietary assessments to define food choices .................................................... 3

1.1.4 The link between taste perception and eating behaviour ............................ 4

1.1.5 Justification of the current research approach ............................................. 5

1.2 Aims and Objectives ............................................................................................. 6

1.3 Structure of the Thesis ......................................................................................... 7

1.4 Researchers Contribution ............................................................................... 8

Chapter Two Literature Review .................................................................................... 9

2.1 Introduction .......................................................................................................... 9

2.1.1 Excessive sugar consumption and increased disease risk .......................... 9

2.2 Introduction to the Sensory World of Food .................................................... 10

2.2.1 Taste receptors ............................................................................................. 11

2.2.2 Sweet, umami and bitter taste detection .................................................... 12

2.2.3 Sour and salty taste detection ..................................................................... 13

2.2.4 “Fat” taste detection .................................................................................. 13

2.3 Sensory Evaluation ............................................................................................ 14

2.3.1 Taste perception ......................................................................................... 14
2.4 Taste Perception and Dietary Intake ................................................................. 20
  2.4.1 Where it all began; linking taste perception and dietary intake .............. 21
  2.4.2 Taste perception and sweet beverages ..................................................... 23
  2.4.3 Methodological differences of sweet taste assessments ....................... 25
2.5 Individual Level Dietary Assessment Methods used in Sensory Research .... 27
  2.5.1 Twenty four hour food recall .................................................................. 30
  2.5.2 Food record ............................................................................................. 30
  2.5.3 Diet history ............................................................................................... 31
  2.5.4 Food frequency questionnaire ................................................................. 32
  2.5.5 Eating behaviours .................................................................................... 34
2.6 Physiological Influences on Taste Perception, Dietary Intake and Eating
  Behaviour ........................................................................................................... 36
  2.6.1 Differences among sexes ........................................................................ 36
  2.6.2 Menstrual cycle ....................................................................................... 37
  2.6.3 Fasting ....................................................................................................... 39
  2.6.4 Age ............................................................................................................ 39
  2.6.5 Ethnicity ................................................................................................... 40
2.7 Conclusion ....................................................................................................... 40
Chapter Three Methodology ...................................................................................... 41
  3.1 Study Design ................................................................................................. 41
  3.2 Ethics Approval ............................................................................................. 41
  3.3 Setting ............................................................................................................ 41
  3.4 Power Calculation ........................................................................................ 41
  3.5 Participants ................................................................................................... 42
  3.6 Study Process ............................................................................................... 42
    3.6.1 Overview of sweet taste study process ................................................ 42
4.6 Relationship between Eating Behaviours, Sweet Food and Beverage Consumption and Beverage Liking ................................................................. 76

4.7 Perceived Sweet Taste Intensity and Hedonic Preference of Sweet Taste .......... 77

4.7.1 Perceived sweet taste intensity .................................................................. 77

4.7.2 Hedonic preference of sweet taste ................................................................. 78

4.7.3 Relationship between perceived sweet taste intensity and hedonic preference of sweet taste ............................................................ 79

4.8 Relationship between Perceived Sweet Taste Intensity, Sweet Food Intake and Sweet Food Related Eating Behaviours ......................................................... 79

4.9 Relationship between Perceived Sweet Taste Intensity and Beverage Liking ..... 81

4.10 Relationship between Hedonic Preference of Sweet Taste, Sweet Food Intake and Beverage Liking .................................................................................. 82

Chapter Five Discussion ............................................................................................ 83

5.1 Participant Characteristics .................................................................................. 83

5.2 Sweet Food-Food Frequency Questionnaire ......................................................... 83

5.2.1 Habitual intake of sweet food categories, everyday and occasional foods ... 83

5.2.2 Habitual intake of individual sweet foods ....................................................... 85

5.2.3 Sweet food related eating behaviours and the relationship with habitual sweet food intake ........................................................................ 86

5.3 Frequency of Beverage Consumption and How this Relates To Beverage Liking 88

5.4 Eating Behaviours of the Sample Population ....................................................... 89

5.4.1 Relationship between eating behaviours, sweet food and beverage consumption and beverage liking ................................................................. 91

5.5 Perceived Sweet Taste Intensity and Hedonic Preference of Sweet ................... 92

5.5.1 Perceived sweet taste intensity .................................................................. 92

5.5.2 Hedonic preference of sweet taste ................................................................. 92
5.5.3 Relationship between perceived sweet taste intensity and hedonic preference of sweet taste.................................................................93
5.5.4 Relationship between perceived intensity, sweet food intake and sweet food related eating behaviours.................................................................94
5.6 Relationship between Perceived Intensity, Beverage Intake and Beverage Liking .................................................................................................95
5.7 Relationship between Hedonic Preference of Sweet Taste, Sweet Food Intake and Beverage Liking.................................................................................95

Chapter Six Conclusion ........................................................................................................97
6.1 Aim of the Research ..................................................................................................97
6.2 Main Findings of the Research ................................................................................97
6.3 Strengths of the Research .......................................................................................98
6.4 Limitations of the Research ...................................................................................100
6.5 Use of the Research Findings ...............................................................................102
6.6 Recommendations for Future Sweet Taste Studies .............................................103
6.7 Conclusion .............................................................................................................103

References ..................................................................................................................105
Appendices ..................................................................................................................117
List of Tables

Table 1.1- Researchers Contribution to the Sweet Taste Study........................................8
Table 2.1- Advantages and disadvantages of dietary intake assessment methods.........29
Table 3.1- Overview of the sweet taste study testing sessions.................................45
Table 3.2- Concentration levels of glucose solutions..............................................49
Table 3.3- Original frequency of the SF-FFQ and conversion to daily frequency equivalents......................................................................................................................50
Table 3.4- Score ranges for each factor on the Three Factor Eating Questionnaire.....51
Table 4.1- Anthropometric characteristics of the sweet taste study participants........55
Table 4.2- Total mean daily frequency equivalents of sweet fruit, and frequency of participants’ consumption responses (N=45).................................................................58
Table 4.3- Mean daily frequency equivalents of sweet vegetables, and frequency of participants’ consumption responses (N=45)......................................................................................................................59
Table 4.4- Mean daily frequency equivalents of sweet dairy, and frequency of participants’ consumption responses (N=45)......................................................................................................................60
Table 4.5- Mean daily frequency equivalents of sweet cereals and frequency of participants’ consumption responses (N=45)......................................................................................................................61
Table 4.6- Mean daily frequency equivalents of spreads/sweeteners, and frequency of participants’ consumption responses (N=45)......................................................................................................................62
Table 4.7- Mean daily frequency equivalents of baking/sweets, and frequency of participants’ consumption responses (N=45)......................................................................................................................63
Table 4.8- Mean daily frequency equivalents of desserts, and frequency of participants’ consumption responses (N=45)......................................................................................................................64
Table 4.9- Mean daily frequency equivalents of beverages, and frequency of participants’ consumption responses (N=45)......................................................................................................................65
Table 4.10- Daily frequency equivalents of everyday and occasional food ..............66
Table 4.11- Sweet food related eating behaviours.................................................66
Table 4.12- Participants’ reasons for why they believed they had a “sweet tooth”.....67
Table 4.13- Participants’ favourite sweet foods.....................................................67
Table 4.14- Participants’ favourite foods and frequency of response ....................68
Table 4.15- Participants’ favourite foods consumed outside of the home and frequency of response

Table 4.16- Categories of favourite snack food and frequency of response by participants

Table 4.17- Frequency of participants craving sweet food and the type of food craved

Table 4.18- Differences in frequency of sweet food consumption caused by presence of a “sweet tooth”

Table 4.19- Differences in sweet food consumption caused by presence of food craving

Table 4.20- Differences in frequency of sweet food consumption and snacking preference

Table 4.21- Liking scores of the sweet beverages

Table 4.22- Frequency of participants liking of each sweet beverage, including mean score of each category

Table 4.23- Relationship between beverage liking and beverage intake

Table 4.24- Descriptive statistics of the Three Factor Eating Questionnaire (n=45)

Table 4.25- Relationship between eating behaviour factors from the TFEQ

Table 4.26- Association between TFEQ eating behaviours and snacking behaviours

Table 4.27- Association between eating behaviours and food cravings

Table 4.28- Relationship between perceived sweet taste intensity (of 1000 mm glucose) and beverage liking
List of Figures

Figure 2.1- Location of taste buds on the papillae of the tongue ............................................. 11
Figure 2.2- Example of a 9 Point Category Scale ........................................................................ 16
Figure 2.3- Example of a 100 mm Visual Analogue Scale (VAS) to measure liking of orange juice ............................................................................................................................ 17
Figure 2.4- General Labelled Magnitude Scale (gLMS): vertical scale measuring intensity and horizontal scale measuring hedonic liking ........................................................................ 19
Figure 2.5- Female menstrual cycle: indicates the menstrual cycle phases and changes in hormones during the cycle and body temperature ........................................................................ 37
Figure 3.1- Three phases of the sweet taste study ...................................................................... 43
Figure 4.1- Overall summary of daily frequency equivalents consumed from different sweet food categories and total sweet food .............................................................................. 56
Figure 4.2- Most frequently consumed foods based on highest daily frequency equivalents ......................................................................................................................................... 56
Figure 4.3- Mean gLMS score of perceived sweet taste intensity (mm) with increasing glucose concentration (mM) .............................................................................................................. 78
Figure 4.4- Mean hedonic preference of sweet taste according to score on the gLMS at each glucose concentration ...................................................................................................................... 78
Figure 4.5- Correlation between perceived sweet taste intensity and hedonic preference sweet taste of 1000 mM glucose ........................................................................................................ 79
Figure 4.6- Relationship between total sweet food intake and perceived sweet taste intensity of 1000 mM glucose ...................................................................................................................... 80
Figure 4.7- Difference of mean scores in perceived sweet taste intensity between those who like sweet snacks and those who like savoury snacks ........................................................................ 81
## List of Appendices

Appendix A: Screening Questionnaire ................................................................. 117  
Appendix B: Participants Consent Form ............................................................. 120  
Appendix C: Participant Information Sheet ....................................................... 121  
Appendix D: Health and Demographic Questionnaire ...................................... 124  
Appendix E: Sweet Taste Study Food Frequency Questionnaire ....................... 127  
Appendix F: Sweet Taste Study Beverage Liking Questionnaire ......................... 131  
Appendix G: Sweet Taste Intensity and Hedonic Preference of Sweet Taste ........... 134  
Appendix H: Sweet Taste Study Additional Results ........................................... 136
## Abbreviation List

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