Australia's National
Science Agency

CSIRO Diet Types Survey

Understanding Australians' dieting personality

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1 Background

The development of the Diet Types began in 2016 with a project that aimed to explore whether different psychological characteristics could be used to define different groups of dieters. In this study, 1534 people were recruited to complete a questionnaire assessing 24 different psychological traits and characteristics that could be related to how people diet. Data were then analysed to reveal five core types. Our team used these data to describe each of the five types and to further understand the different needs and challenges associated with these different types.

The five types were labelled: Craver, Foodie, Thinker, Socialiser and Freewheeler.

- The *Craver* type was defined by higher feelings of food cravings, and lower feelings over controlling eating in a variety of situations – including feeling sad, having food available or because other people were pressuring. In this initial study, people who had higher scores as a Craver also had higher Body Mass Index, higher concerns for their weight and more lifetime attempts at dieting.
- The *Foodie* type reported higher involvement with food preparation, cooking, and planning, as well as greater appreciation of food and lower preference to eat for convenience and follow a fixed eating pattern. Being higher in these Foodie traits was associated with greater vegetable consumption.
- The *Thinker* type included multiple traits that were all associated with being motivated to avoid negative outcomes, tending toward worry and having concerns about making mistakes. These tendencies have all be related to "mental noise" and encompass someone who is likely to have lots of internal dialogue that tends toward the negative. Those people higher in Thinker traits had higher concerns about their body weight and lower ratings of their overall health.
- The *Socialiser* type included people who felt that they were approachable and valued their relationships. Levels of extraversion were also associated with Socialiser traits. People with higher scores for this type also had higher ratings for their overall health.
- The *Freewheeler* type was defined by characteristics including higher impulsivity and lower planning and organisation. Higher scores for the Freewheeler traits were associated with feeling less successful controlling body weight and less healthy overall.

2 Diet Types Survey

2.1 Diet Types Tool

Based on the initial study in 2016, a new tool was created that was designed to capture each of the five Diet Types through a short survey. The tool classified people into their dominant Diet Type based on a series of rules and algorithms and then presented people with feedback and advice on their specific type. The type was assigned based on the patterns of traits they scored highest for. If scores for two Diet Type traits were close together, people were presented with both types and asked to choose the one they identified with most.

Once tested, the free tool was launched in 2017 on the totalwellbeingdiet.com website. It received over 40,000 responses in its first week. User acceptance of the types presented was high with over 95% acceptance for all types except the Freewheeler which had 88% agreement. Based on an early analysis of responses (n=63,572), 71.9% of people had one or two dominant types. Thinkers were the most common type, followed by Cravers (Figure 1). There was also a large group of people (24.1%) who were presented with more than one type who were undecided and did not select a type. Following this, changes were implemented to the interface to reduce this occurrence. While only a select few identified as Freewheelers (<5%), this type was retained given its potential importance for dieting advice and its distinctness from the other types.

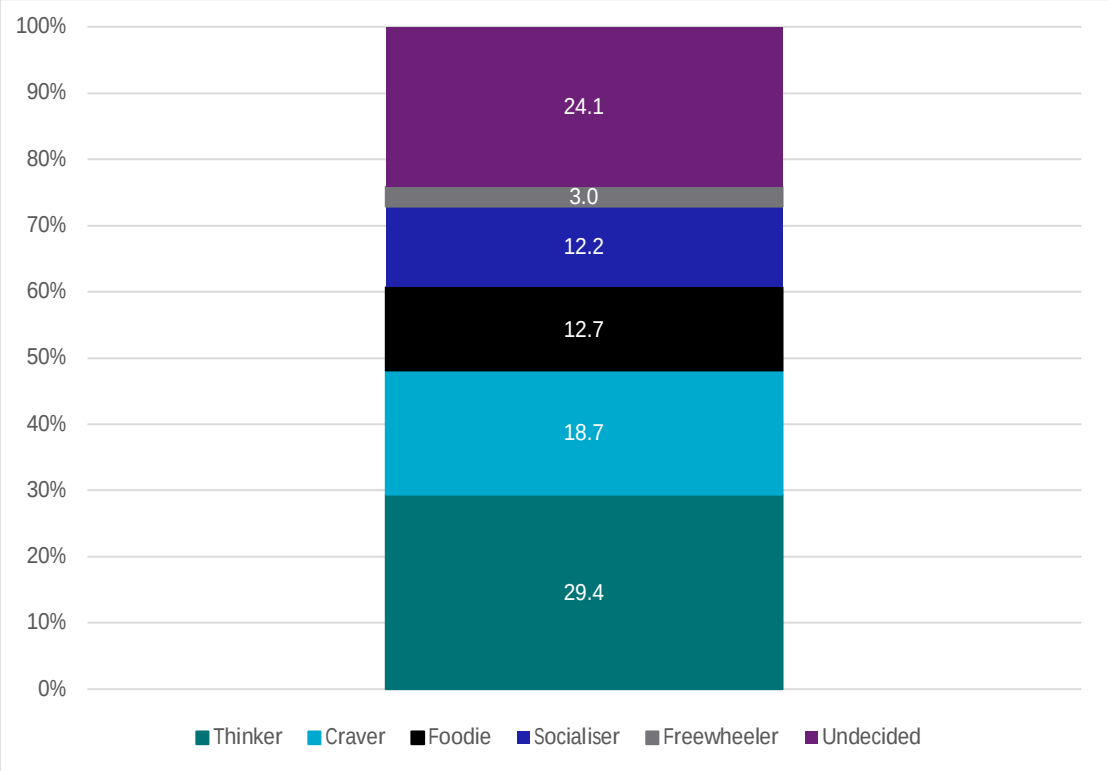

Figure 1. Frequency of Diet Types in the original sample (n=63,572)

2.2 Diet Types 2.0

The original Diet Types tool remained available since its launch and has continued to attract interest from the Australian public. Early in 2021, a new project was started with the aim of refining and improving the tool based on available data and any new scientific evidence.

The objectives of this study were to:

1. Assess the frequency of Diet Types and variation by demographic characteristics
2. Analyse the tool items and responses to ensure validity of the original Diet Types
3. Explore whether certain Diet Types were related with different dietary intake
4. Explore whether certain Diet Types were related to weight loss and engagement with the Total Wellbeing Diet online program
5. Assess agreement between allocated Diet Types and user-selected Diet Types
6. Examine these data and create new Diet Type categories if appropriate.

To address the above aims, data collected were synthesised into three samples: All those who had completed the Diet Types tool (n=245,699), those who completed this tool as well as the Diet Score tool (n=29,975) and finally those who completed the tool and were members of the Total Wellbeing Diet (n=41,427). The second two are subsamples from the initial pool of 245,699.

2.3 Data Analysis

For this report, data was available from the CSIRO Diet Type Survey collected between December 2016 and April 2021. A total of 245,699 individuals had completed the survey during this time. This included data for the lifetime of the tool which encompassed the initial 63,572 responses whose data is presented above. For the complete sample, the survey included information on Diet Type, as well as demographics characteristics including gender, age, height and weight, ethnicity, and state of residence.

To understand the dietary behaviours common to each of the Diet Types, a subsample of 29,975 people who had completed the Diet Types Survey as well as the CSIRO Healthy Diet Score Survey was analysed. The CSIRO Healthy Diet Score Survey is an assessment of diet quality, operationalised as compliance with the Australian Dietary Guidelines. The overall diet quality, variety of foods consumed, vegetable intake (as a marker of a healthy diet) and discretionary choices intake (as a marker of an unhealthy diet) were examined.

A second subsample of 41,427 people who had completed the Diet Types survey and were members of the CSIRO Total Wellbeing Diet were also analysed. The CSIRO Total Wellbeing Diet is a 12-week, subscription, online weight loss program. These data were analysed to examine the weight loss outcomes and engagement with the program. The average starting body mass index, weight loss over 12 weeks, total length of membership and engagement with the online platform (as the number of logins) were examined here based on metrics obtained from the online platform.

The demographic characteristics of each sample is presented in Table 1.

Table 1. Demographic characteristics of the three samples used in this analysis

	Diet Types	Diet Types and Diet Score	Diet Types and TWD Members
Total Sample Size	245,699	29,975	41,427
Gender			
Female	85.2%	88.8%	85.7%
Male	14.8%	11.2%	14.3%
Age group			
18-30 years	13.2%	14.8%	6.9%
31-50 years	42.8%	38.6%	43.6%
51-70 years	40.9%	43.1%	46.4%
71 years+	3.1%	3.5%	3.0%
Weight status			
Underweight	0.7%	1.3%	0.1%
Normal weight	18.0%	37.2%	6.0%
Overweight	32.4%	28.4%	33.7%
Obese	49.0%	33.2%	60.2%
Ethnicity			
British/Irish/Scottish descent	68.5%	72.3%	73.3%
European	21.9%	20.6%	20.0%
Missing data	1.9%	1.6%	1.4%
Other	7.7%	5.5%	5.3%
Socioeconomic status			
Lowest Quintile	10.6%	9.3%	10.4%
Second Quintile	15.5%	14.3%	15.1%
Third Quintile	19.5%	18.7%	20.0%
Forth Quintile	21.6%	21.9%	21.7%
Highest Quintile	30.5%	34.6%	32.2%
Missing data	2.3%	1.2%	0.7%

*when cell counts account for less than 2% of the sample, data was not included in the report.

3 Selected Diet Types

Analysis of the tool questions and responses revealed that all items were performing well and that the survey detected five clear types. Generally, levels of endorsement for the Freewheeler items remained low, but the items and scores were still valid.

Each of the five Diet Type dimensions (Thinker, Craver, Foodie, Socialiser and Freewheeler) was scored and the Diet Type with the highest score presented. If people received a similar score for more than one Diet Type dimension, they could select between the Types with similar scores. About one third (32.3%) of the total sample (n=245,699) had a single dominant Diet Type. Consequently, two thirds of the sample had a combination Diet Type – that is had scores that were close on more than one dimension. These combinations were mostly made up of two (38.2%) or three Diet Types (21.9%).

Obese individuals were more likely to report combination Diet Types than normal weight individuals, that is a similar score for 2 or more Diet Type dimensions (Table 2).

Table 2. Total number of Diet Types by demographic characteristics (n=245,699)

	Number of Diet Types calculated					
	1	**2**	**3**	**4**	**5**	**Total**
Total	32.3%	38.2%	21.9%	6.6%	0.9%	100.0%
Gender						
Female	32.2%	38.4%	21.9%	6.6%	0.9%	100.0%
Male	32.8%	37.3%	21.7%	6.9%	1.2%	100.0%
Age group						
18-30 years	33.4%	38.3%	21.2%	6.2%	0.9%	100.0%
31-50 years	32.5%	38.5%	21.6%	6.5%	0.9%	100.0%
51-70 years	31.9%	38.0%	22.3%	6.8%	0.9%	100.0%
71 years+	31.3%	36.8%	23.9%	7.2%	0.8%	100.0%
Weight status						
Underweight	39.1%	40.6%	15.8%	3.9%	0.6%	100.0%
Normal weight	35.7%	38.2%	20.6%	4.9%	0.6%	100.0%
Overweight	32.1%	38.2%	22.2%	6.6%	0.9%	100.0%
Obese	31.1%	38.3%	22.3%	7.3%	1.1%	100.0%
Ethnicity						
British/Irish/Scottish descent	32.5%	38.4%	21.8%	6.5%	0.9%	100.0%
European	32.3%	37.9%	22.0%	6.8%	1.0%	100.0%
missing	32.8%	37.7%	21.4%	6.8%	1.3%	100.0%
Other	30.9%	38.0%	22.7%	7.3%	1.1%	100.0%
Socioeconomic status						
Lowest Quintile	33.1%	37.9%	21.2%	6.7%	1.0%	100.0%
Second Quintile	32.2%	38.4%	21.9%	6.6%	1.0%	100.0%
Third Quintile	32.3%	38.2%	21.9%	6.7%	1.0%	100.0%
Forth Quintile	32.5%	38.0%	21.9%	6.7%	0.9%	100.0%
Highest Quintile	31.9%	38.5%	22.2%	6.6%	0.8%	100.0%
Missing data	33.7%	38.4%	20.9%	6.1%	0.9%	100.0%

Among the sample of 245,699 people who completed the survey:

- The most common Diet Types that this sample of Australians identified with were Thinker (31%) and Craver (23%), followed by Socialiser (14.2%) and Foodie (13.2%).
- 14.6% of Australians were undecided about which Diet Type they identified with most (Figure 2).

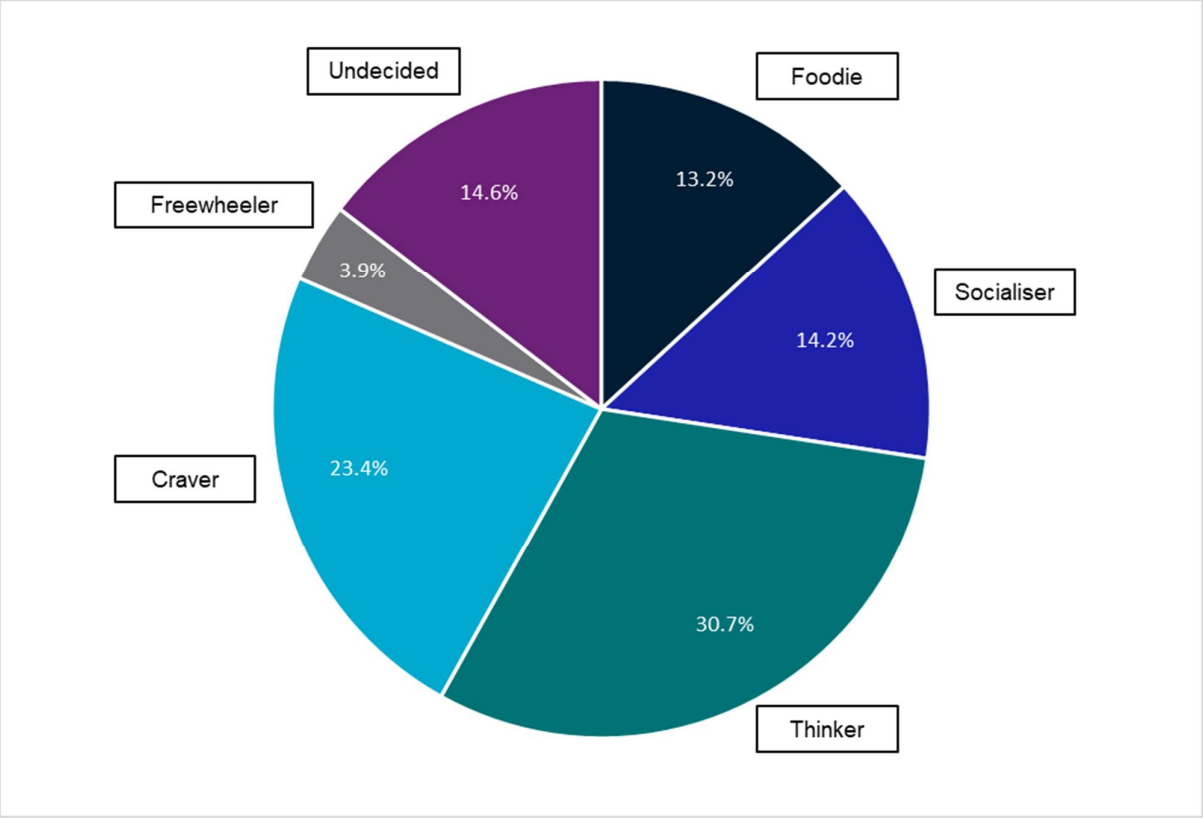

Figure 2. Frequency of Diet Types among a sample of Australians (n=245,699)

4 Diet Type Combinations

Although the tool clearly differentiated the five types as originally discovered, there was clear suggestion that many people were borderline across multiple Diet Types. The number of 'undecided' fell to 14% (from 24%) since our early analysis, but we still wanted to also try to reduce this further. This led to exploring what combinations of Diet Types were most common and whether the creation of new or refined diet-type categories was called for. Therefore, we conducted a secondary analysis to better understand what was happening when people had similar scores for multiple Types.

About one third of the sample had a single dominant Diet Type. The pure types were as follows:

- 14.1% of people scored Thinker and 7.3% of people scored Craver as a single Diet Type.
- 5.9% of people scored Foodie and 4.8% of people scored Socialiser as a single Diet Type.
- Very few people, scored Freewheeler as a single Diet Type (Table 3).

Combination types were created where scores for two diet dimensions were not significantly different from each other (within a set range). All possible 325 combinations of the Diet Types were considered. This analysis revealed:

- Amongst all combinations considered, the pure Thinker remained the most common type (14.1% of the sample).
- Craver Thinker was most common combination of Types (12.8%), followed by Socialiser Thinker (7.1% combined), and Foodie Thinker (7.0%).
- The Thinker Diet Type was present in all the most common combinations (Table 3).

Table 3. The most common single and combinations of Diet Types (n=245,699)

Single dominant Diet Type			**Combination Diet Types**		
	Frequency	Percentage of sample		Frequency	Percentage of sample
Thinker	34667	14.1%	Craver Thinker	31369	12.8%
Craver	18028	7.3%	Socialiser Thinker	17431	7.1%
Foodie	14552	5.9%	Foodie Thinker	17308	7.0%
Socialiser	11690	4.8%	Foodie Socialiser Thinker	16496	6.7%
Freewheeler	466	0.2%	Craver Socialiser Thinker	12547	5.1%

Given the high proportion of some of these combinations, it was decided that it would be beneficial to include combination types as part of the new tool. This would better capture people's actual traits and hopefully reduce the need for people to select between multiple types if they had similar scores. Further analysis of the dietary habits and participation and outcomes on the CSIRO Total Wellbeing Diet was performed using these most common combination types to better understand these new types any associations with behaviour.

5 Diet Types and Diet Quality

A subsample of people (n=29,975) who had completed the Diet Types survey had also completed the CSIRO Healthy Diet Score Survey. The CSIRO Healthy Diet Score Survey is an assessment of diet quality, operationalised as compliance with the Australian Dietary Guidelines.

These data were analysed to examine the dietary intake characteristics among people with the most common Diet Types to allow for the provision of more tailored dietary advice. The average overall diet quality, variety of foods consumed, vegetable intake (as a marker of a healthy diet) and discretionary choices intake (as a marker of an unhealthy diet) were examined.

Among this sample:

- The Foodie and Foodie Socialiser Thinker combination had the highest diet quality scores, the greater dietary variety, and the lowest discretionary choices intake.
- In contrast, the Craver and Craver Thinker combination had the lowest diet quality scores, the lowest dietary variety, and the highest discretionary choices intake.
- The Craver and Craver Thinker combination were ranked lowest in terms of healthiness of diet across all components of diet quality measured, and Foodie and Foodie Socialiser Thinker ranked highest across all components of diet quality measured (Table 4).

Table 4. Ranking of scores for components of diet quality by Diet Type (n=29,975)

Ranking	Diet quality	Variety	Vegetables	Discretionary
Least healthy	Craver Thinker	Craver	Craver Thinker	Craver
	Craver	Craver Thinker	Craver	Craver Thinker
	Craver Socialiser Thinker	Craver Socialiser Thinker	Socialiser Thinker	Craver Socialiser Thinker
	Thinker	Thinker	Craver Socialiser Thinker	Thinker
	Socialiser Thinker	Socialiser Thinker	Thinker	Socialiser Thinker
	Foodie Thinker	Socialiser	Socialiser	Foodie Thinker
	Socialiser	Foodie Thinker	Foodie Thinker	Socialiser
	Foodie	Foodie Socialiser Thinker	Foodie Socialiser Thinker	Foodie
Most healthy	Foodie Socialiser Thinker	Foodie	Foodie	Foodie Socialiser Thinker

6 Diet Types Results and Outcomes in Total Wellbeing Diet Online Members

A subsample of people (n=41,427) who had completed the Diet Types survey were also members of the CSIRO Total Wellbeing Diet. The CSIRO Total Wellbeing Diet is a 12-week, subscription online weight loss program.

These data were analysed to examine the weight loss outcomes and engagement with the program. The average starting body mass index, weight loss over 12 weeks, total length of membership and engagement with the online platforms (as the number of logins) were examined.

Among this sample of members:

- Cravers had the highest BMI when they started the program and were among the least successful groups in terms of weight loss on the program. They also had the shortest membership length.
- Craver Thinker and Craver Socialiser Thinker combinations also started the program with one of the highest BMIs. Their weight loss was among the lowest of these groups.
- The Foodie, and combinations that contained Foodie (that is the Foodie Thinker and Foodie Socialiser Thinker), started the program with the lowest BMIs. They recorded the highest weight loss among these groups and engaged with the website the most of these groups.
- The Craver and Craver Thinker combination were ranked lowest in terms of success on the CSIRO Total Wellbeing Diet program, and Foodie Thinker and Foodie Socialiser Thinker combinations ranked highest in terms of their success on the program (Table 5).

Table 5. Ranking of starting body mass index and outcomes on the CSIRO Total Wellbeing Diet (n=41,427)

Ranking	Starting BMI	12-week weight loss	Membership length	Website engagement
Less positive	Craver	Craver Socialiser Thinker	Craver	Craver Socialiser Thinker
	Craver Thinker	Craver	Craver Thinker	Craver
	Craver Socialiser Thinker	Thinker	Socialiser	Craver Thinker
	Socialiser	Socialiser	Craver Socialiser Thinker	Socialiser
	Thinker	Craver Thinker	Thinker	Socialiser Thinker
	Socialiser Thinker	Socialiser Thinker	Socialiser Thinker	Thinker
	Foodie	Foodie Socialiser Thinker	Foodie Socialiser Thinker	Foodie Socialiser Thinker
	Foodie Socialiser Thinker	Foodie	Foodie Thinker	Foodie Thinker
More positive	Foodie Thinker	Foodie Thinker	Foodie	Foodie

7 Agreement in Diet Type Results

This section compared the calculated dominant Diet Type or combination type with the Diet Type people had reported they to identified with.

- For people who had a single dominant type, they almost always agreed and identified with this type.
- Among those who were calculated to be a combination Diet Type we examined which type people identified with more. Craver Thinkers were more likely to identify as a Craver (47.4%) more than a Thinker (32.1%). Craver Socialiser Thinkers were also most likely to identify as a Craver (40.7%), compared to a Socialiser (15.7%) or a Thinker (23.1%).
- People within the other common combinations that contained Thinker tended to identify as a Thinker (Table 6).

Table 6. Agreement between calculated Diet Type combinations and identified Diet Types

		Diet Type Identified					
Calculated type	Most common	Craver	Foodie	Freewheel	Socialiser	Thinker	Undecided
Single dominant type	Thinker	0.2	0.1	0.3	0.1	99.3	0.0
	Craver	99.5	0.0	0.1	0.0	0.2	0.0
	Socialiser	0.8	0.6	0.9	95.4	2.3	0.0
	Foodie	0.6	94.0	1.6	0.7	3.1	0.0
Combination types	Craver Thinker	47.4	0.0	0.1	0.0	32.1	20.4
	Socialiser Thinker	0.2	0.2	0.3	34.3	40.6	24.4
	Foodie Thinker	0.1	30.2	0.5	0.1	45.0	24.0
	Foodie Socialiser Thinker	0.2	19.0	0.5	28.7	28.8	22.9
	Craver Socialiser Thinker	40.7	0.0	0.1	15.7	23.1	20.3

- Among people who were undecided on the Diet Type they identified with most, it was most common for them to be a combination Diet Type. The most common combination types in this undecided group were Craver Thinkers (17.8%), Socialiser Thinkers (11.8%), and Food Thinkers (11.6%).

8 Summary

The aim of this project was to assess the Diet Types tool and explore areas for refinement. Since its initial launch in 2017 which attracted 40,000 responses, the Diet Types tool has continued to promote engagement. Up to April 2021, it had 245,699 completions.

Analysis of these data, in combination with behavioural data, suggested that overall the tool was performing well to classify people into five distinct groups. However, there was a large proportion of people who did not have one single, dominant type. Exploring combinations of Diet Type traits revealed that some people seemed to have similar amounts of two or more Diet Types, such as the Craver Thinker. Even though the characteristics that underlie these traits remain distinctive, it appeared from our large sample that it is common for these to co-occur. Analysis of the dietary behaviours, outcomes and participation in the CSIRO Total Wellbeing Diet program suggested that this group of people may experience different outcomes and benefit from more specialised advice than other groups.

Based on the above data and scientific theory, we concluded that two changes to the existing tool could improve its relevance and the ability to provide people with more tailored weight loss advice. These are discussed further below.

Removal of Freewheeler Type

The Freewheeler Type remained distinctive from the others. However, respondents tended to agree less with the items assessing this characteristic. This meant that it was uncommon for it to be considered dominant amongst the other Diet Types. The decision was made to remove this from the overall classification. But given its importance based on the initial investigations and its distinctiveness as a trait relevant to dieting, it was not removed from the tool. Instead, it was decided that scores for this would be used to give users an idea of how much they like planning relative to freewheeling using the normative values ascertained from the whole sample to indicate ‘higher’ and ‘lower’ tendencies in this dimension. This means that the concept can be retained, and advice can still be tailored around this Diet Type.

Creation of combination types

It was clear from the large dataset of responses that people possess similar amounts of multiple Diet Type dimensions. It was decided to create new combination types to capture larger numbers of people without forcing them to choose between two or three Types. Of the most common combination Types, two were chosen: Craver Thinker and Socialiser Thinker. Although Foodie Thinkers were slightly more common than the Socialiser Thinkers, the decision was made to include Socialiser Thinkers because the pure Socialiser category only captured less than 5% of the entire sample. Labels for these new combination Types were workshopped resulting in the final labels Battler (Craver Thinker) and Pleaser (Socialiser Thinker).

9 Conclusion

With the launch of the refined Diet Type tool, changes to the scoring algorithm will be implemented to classify individuals into six core Diet Types:

- *The Thinker* – goal-oriented, motivated and analytical, however sensitive to negative feedback that can lead to stress or anxiety which could ultimately derail their diet.
- *The Battler (new)* – likely to experience regular food temptation as well as being prone to stress and worry. Battlers require some unique strategies to help them break the cycle and achieve long-term success in their diet journey.
- *The Craver* – likely to experience strong food cravings that may lead to overeating in 'tricky' food related settings. Cravers had the highest Body Mass Index of all types.
- *The Pleaser (new)* - likeable and friendly but can also be sensitive to social comparisons which can make them feel like they are not doing well. They are likely to have many people to call upon to support them.
- *The Foodie* – passionate about all things food including the experience of preparing and eating good quality meals. Foodies love variety and have the best diet quality of all Types. Men often identify as Foodies.
- *The Socialiser* – a people-person who needs flexibility to make sure strict food restrictions don't stifle social occasions or 'kill the mood' of an event.

New support materials will be developed to provide targeted advice and strategies for the six Diet Types. It is hoped that additional support and more tailored advice can help improve diet and weight loss outcomes. Further work will also be undertaken to explore what additional support Cravers and Battlers could benefit from. Despite having high participation in dieting, people with these Types appear to have worse outcomes and lower quality diets and therefore may benefit from extra support.

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