FIVE YEAR REVIEW
OF THE HEALTH STAR RATING (HSR) SYSTEM

HSR Technical Advisory Group (TAG)

Confectionery

Contents

Summary

Monitoring of the implementation of the HSR system indicates that the largest product category displaying the HSR system is confectionery, with two thirds of these products displaying only the energy icon and not the HSR itself. Energy is the key component considered by the HSR Calculator for these products, with total sugars and saturated fat of secondary importance. HSRs range from 0.5 to 3.0, with chocolate products at the lower end of the scale, sugar-based products in the middle, and sugar-free mints and gums at the upper end.

All products within this category are classified as discretionary under Australian Dietary Guidelines (ADG). There are limited opportunities for reformulation to improve HSRs. As such, in media and in submissions to the five year review, the eligibility of confectionery to use the HSR system has been questioned. In addition, concerns have also been raised that some products are receiving inappropriately high HSRs.

Several options for products in this category have been identified:
1. No change/status quo
2. Changes to HSR system guidance
   a. Confectionery ineligible to display the HSR system
   b. Limit confectionery to use of energy icon only
   c. Remove confectionery from Category 2 and cap HSRs for products
   d. Remove confectionery from Category 2 and assign a single, mandatory HSR
3. A change to Category 2 to shift more products towards the bottom end of the HSR range
4. Increase the impact of sugars in the HSR system
5. A wider strategy to address perceived anomalies, particularly where discretionary foods receive higher HSRs. This option would include separating Category 2 into four 'FFG' and one 'discretionary' food categories and then rescaling the 'discretionary' category.

Options 4 and 5 are not considered further in this report as they are subject to consideration in other areas of TAG's work.

As this product range will be heavily impacted by the outcomes of TAG work on sugars, this technical report is primarily presented for information only. Further adjustments to Category 2 which will impact upon this product range, for example the creation of additional HSR Categories (option 5) or modifying scaling for Category 2 (option 4), may be considered when total system enhancements are considered.

Problem definition

This paper discusses the Australian Health Survey (AHS) categories "Chocolate and chocolate-based confectionery" and "Lollies and other confectionery, sugar sweetened, other." All products within these categories are classified as discretionary under the AHS: Users' Guide, 2011-13 — Discretionary Food List.[1] There is no definition of confectionery in the Australia New Zealand Food Standards Code (FSC) for manufacturers/retailers to use. However, the concept of "confectionery" is generally understood by the population.

Monitoring of the HSR system implementation[2] indicates that confectionery (n=510) is the largest product category displaying the HSR system, as of end June 2018, with most products (n=337) displaying only the energy icon and not the HSR itself. Where HSRs are used, they range from 0.5 to 3.0 with chocolate products at the lower end of the scale, sugar-based products in the middle, and sugar-free mints and gums at the upper end. The majority of confectionery products (54%) displaying a HSR (excluding those displaying only the energy icon) receive ≤1 HSR; 24% receive ≥2 HSRs.

The TAG database contains 934 confectionery-type products. Table 1 provides the range of energy, saturated fat and total sugars content and HSRs for chocolate- and sugar-based confectionery.

Table 1: AHS categories included, number of products in TAG database, and range of component contents from TAG database

Code	Group	Number in TAG database	Energy range (kJ/100g)	Sat'd fat range (g/100g)	Total sugars range (g/100g)	HSR
28101 28102 28103	Chocolate and chocolate-based confectionery	47	1335-2410	5-30	28-71	0.5-1.5
28401 28405	Lollies and other confectionery sugar sweetened, other	46	1360-1720	0-3	37-93	0.5-2

Figure 1 demonstrates the actual and predicted distribution of Star Points for confectionery, based on the current TAG database. Figure 2 shows the effect of a one standard deviation (SD) change to the relevant component on Star Points (e.g. a one SD increase in energy would lower the Star Points by 0.7), highlighting the components considered in this category. Negative components are the drivers of these scores for confectionery: in descending order these are energy, total sugars, saturated fat and sodium (Figure 2). Appendix 1 includes further graphs highlighting the relationship between HSR algorithm components and scores for this category.

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[1] Australian Bureau of Statistics, 2014, Australian Health Survey - Discretionary Food List, available at http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4363.0.55.0012011-13?OpenDocument

[2] National Heart Foundation of Australia, 2018, Report of products displaying the Health Star Rating (HSR) system (HSR products) in FoodTrack™, over time, up to 3 June 2018 (Quarter Six)
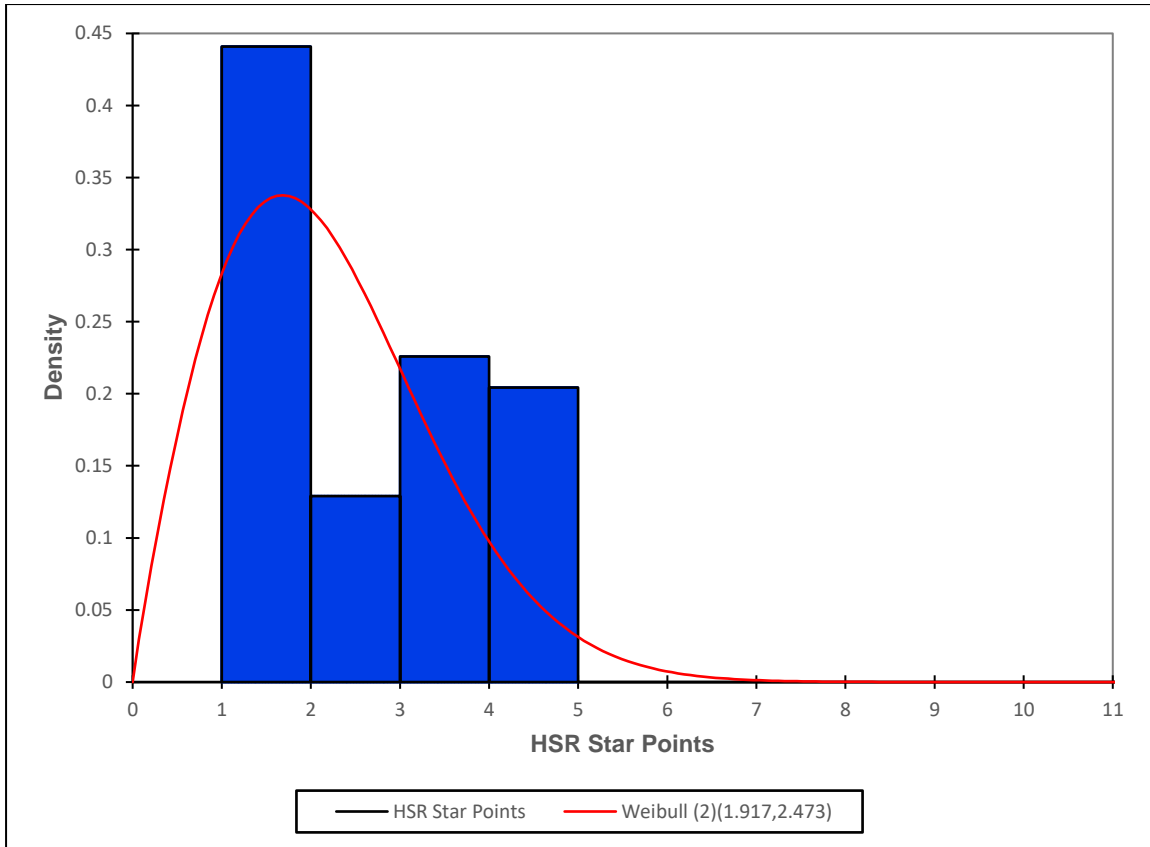
Figure 1: Star Points distribution for confectionery products in TAG database (n=93)
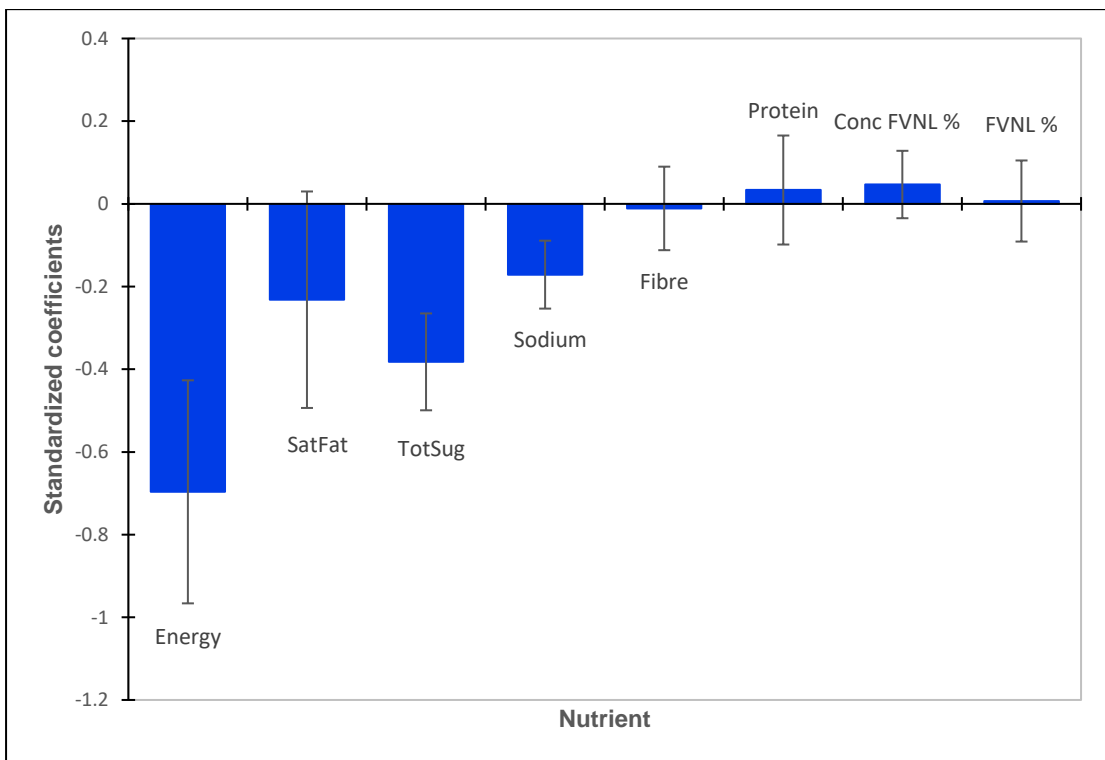

Figure 2: Component sensitivities (standardised coefficients) for confectionery, with 95% confidence intervals

Confectionery consumption data

Australia

The 2011-12 AHS[3] reported confectionery consumption as both 'chocolate and chocolate-based confectionery' and 'other confectionery'. 15.2% of people aged two years and over reported consuming chocolate confectionery on the previous day and 9.8% consumed other confectionery. Among these consumers, median daily consumption of chocolate confectionery was 28.4 g and of 'other confectionery' (primarily sugar-based lollies) was 16.6 g, with males consuming larger amounts than females. Across the population, more people reported consuming 'chocolate and chocolate-based confectionery' than 'other confectionery' (16.6% and 10.7% respectively). Confectionery provides around 8% of the daily intake of free sugars for Australians aged 2 years and over.[4] Table 2 details the contribution of confectionery to energy and selected nutrient intake for the Australian population.

Table 2: Percentage contribution of confectionery to intake of energy and select nutrients, Australia, 2011-12[5]

Component	Total Population 19 + years	Total Population 2-18 years	Female 19 + years	Female 2-18 years	Male 19+ years	Male 2-18 years
Energy	2.0	2.7	2.4	3.1	1.7	2.4
Protein	0.6	0.9	0.5	0.8	0.7	1.0
Fat (total)	2.5	3.2	2.0	2.8	3.1	3.6
Fat (saturated)	3.9	4.5	3.2	3.9	4.8	5.3
Carbohydrate	2.6	2.2	2.2	3.0	3.2	3.5
Sugars (total)	4.7	5.6	4.0	5.2	5.6	6.3
Free sugars	7.5	8.5	9.3	9.4	6.1	7.6
Sodium	0.3	0.5	0.3	0.5	0.4	0.6

New Zealand

The 2008-09 NZ Adult Nutrition Survey[6] reported on the consumption of 'sugar and sweets,' comprised of sugars, syrups, confectionery, chocolate, jam, honey, jelly, sweet toppings and icing, ice-blocks and artificial sweeteners. The 2002 National Children's Nutrition Survey[7] reported the consumption of 'sugar and sweets' for 5-14 year olds.

Tables 3 and 4 show the proportion of each macronutrient that comes from 'sugar and sweets' for adults and children in New Zealand.

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[3] ABS, 2014, Australian Health Survey: Nutrition First Results - Foods and Nutrients, 2011-12, available at http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4364.0.55.007Main+Features12011-12?OpenDocument

[4] ABS, 2017, Australian Health Survey: Consumption of added sugars, 2011-12, available at http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4364.0.55.011Main+Features202011-12?OpenDocument

[5] ABS, 2014, Australian Health Survey: Nutrition First Results - Foods and Nutrients, 2011-12; ABS, 2017, Australian Health Survey: Consumption of added sugars, 2011-12

[6] Ministry of Health, 2011, Chapter 3 Nutrient Intakes and Dietary Sources: Energy and Macronutrients, available at https://www.health.govt.nz/system/files/documents/publications/a-focus-on-nutrition-ch3_0.pdf

[7] Ministry of Health, 2003, NZ Food NZ Children - Key results of the 2002 National Children's Nutrition Survey, available at https://www.health.govt.nz/system/files/documents/publications/nzfoodnzchildren.pdf

Table 3: Percentage contribution of sugar and sweets to intake of macronutrient components for adults, 2008-09, New Zealand

Component	Total Population	Female	Male
Energy	4.2	4.3	4.2
Protein	0.9	1.0	0.7
Fat (total)	2.2	2.5	1.9
Fat (saturated)	2.8	3.2	2.4
Carbohydrate	7.1	6.9	7.3
Sugars (total)	14.6	13.4	15.9
Dietary fibre	1.1	1.2	0.9

Table 4: Percentage contribution of sugar and sweets to intake of macronutrients for children, 2002, New Zealand

Component	Total Population 5-14 years	Female 5-14 years	Male 5-14 years
Energy	5	5	5
Protein	<4*	<3*	<4*
Fat (total)	<5*	<4*	<5*
Fat (saturated)	<4*	<4*	<5*
Carbohydrate	7	7	7
Sugars (total)	15	14	15
Dietary fibre	<2*	<2*	<2*

* Sugar and sweets was not in the top 10 contributing categories for this nutrient/food component and unreported, therefore the value indicates less than the % contribution of the 10th contributing category

Issues raised in 5 year review submissions

The key message of relevant submissions to the five year review was that confectionery is a discretionary product of low nutritional value and with high sugar/energy content. Issues revolved around discussions of whether confectionery should display a "health" star rating and perceptions that certain products with high sugar/energy content receive what are considered to be inappropriately high HSRs. Further submissions highlighted the inability of products within this category to meaningfully reformulate.

Various policy options to address perceived issues were proposed, some conflicting:
- Confectionery should not display the HSR system
- Confectionery should display the HSR system
- Confectionery should use the energy icon only
- Confectionery should not use the energy icon only
- HSRs for confectionery should be capped

Proposed technical enhancements included adjusting weighting for sugars in the HSR Calculator so it has a greater impact on ratings.

Alignment with system objectives and priorities

Linkages with other TAG work

The following issues have been raised for consideration in the 5 year review and are being considered by TAG separately:

- Other sweet discretionary product categories (e.g. jelly, ice confectionery, ice cream, snack bars, cakes, biscuits and pastries)
- Treatment of sugars (whether total or added).

Dietary guidelines

This category is considered discretionary in the Australian Dietary Guidelines (ADG) and Australian Guide to Healthy Eating (AGHE). The specific advice provided is as follows:

Limit intake of foods and drinks containing added sugars such as confectionery, sugar-sweetened soft drinks and cordials, fruit drinks, vitamin waters, energy and sports drinks[8]

The New Zealand Eating and Activity Guidelines (NZEAG) state:

Choose and/or prepare foods and drinks with unsaturated fats instead of saturated fats and little or no added sugar[9]

Effect of changing the algorithm

As confectionery is within Category 2 (all foods other than those included in Category 1, 1D, 2D, 3 or 3D), a large and diverse range of products would be affected by any general changes to this Category.

Nutrient Profiling Scoring Criterion (NPSC)

Products with a NPSC of less than 4[10] (equivalent to a HSR >3) qualify to carry health claims, subject to meeting other claim-specific requirements.

Other evidence

The World Health Organisation (WHO) strongly recommends adults and children reduce their daily intake of free sugars to less than 10% of their total energy intake[11]. A further recommendation is for intake to be reduced to below 5% or roughly 25 grams (6 teaspoons) per day for adults to minimise lifetime risk of dental caries. The recommendations are based on analysis of scientific evidence that shows that consumption of sugars has an effect on body weight and higher rates of dental caries when the intake of free sugars is above 10% of total energy intake. However, over half of Australians[12] and New Zealanders[13] exceed these recommendations.

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[8] National Health and Medical Research Council, 2013, Australian Dietary Guidelines, p. v, available at https://www.nhmrc.gov.au/_files_nhmrc/file/publications/n55_australian_dietary_guidelines1.pdf

[9] Ministry of Health, 2015, Eating and Activity Guidelines for New Zealand Adults, p. 6, available at https://www.health.govt.nz/system/files/documents/publications/eating-activity-guidelines-for-new-zealand-adults-oct15_0.pdf

[10]FSANZ, 2017, Australia New Zealand Food Standards Code Schedule 4 – Nutrition, Health & Related Claims, available at https://www.legislation.gov.au/Details/F2017C00711

[11] World Health Organization, 2015, Guideline: Sugars intake for adults and children, p. 4, available at http://apps.who.int/iris/bitstream/10665/149782/1/9789241549028_eng.pdf?ua=1

[12] ABS, 2016, Australian Healthy Survey: Consumption of added sugars, 2011-12

[13] Kibblewhite R, Nettleton A, McLean R, Haszard J, Fleming E, et al., 2017, Estimating Free and Added Sugar Intakes in New Zealand, Nutrients 9(12), available at https://doi.org/10.3390/nu9121292

A 2016 study[14] found consumers felt products with HSRs≤2 were generally considered unhealthy, whereas those with HSRs of ≥3 were seen as healthier options.

Consideration of issues raised and options to address identified issues

Several options have been identified through submissions or by the TAG:

1. No change/status quo
2. Changes to HSR system guidance
   a) Confectionery ineligible to display the HSR system
   b) Limit confectionery to use of energy only icon
   c) Remove confectionery from Category 2 and cap HSRs for products
   d) Remove confectionery from Category 2 and assign a single, mandatory HSR
3. A change to Category 2 to shift more products towards the bottom end of the HSR range
4. Increase the impact of sugars in the HSR system
5. A wider strategy to address perceived anomalies, particularly where discretionary foods receive higher HSRs. This option would include separating Category 2 into four 'FFG' and one 'discretionary' food categories and then rescaling the 'discretionary' category.

A summary of the pros and cons of these options is presented in Table 5.

Additional analysis of options

Methods

The initial database used in the development of the HSR system was expanded with data provided by the food industry. This revised HSR database (the TAG database) covers the range of HSR component data (where applicable) for over 5,800 food products across 42 food categories based on the AGHE, such as fats and oils, core cereals and dairy, processed and unprocessed fruits and vegetables, animal protein etc. The data are not independently verified. All data analysis was conducted on the most recent active version of this database using the current version of the HSR algorithm obtainable from the HSR website, or otherwise as defined in the current Guide for Industry.[15]

The analysis was undertaken using the most recent version of Microsoft Excel for Mac (version 16.11.1) and the Microsoft software partner add-in application XLSTAT 2017: Data Analysis and Statistical Solution for Microsoft Excel[16]. XLSTAT provides modelling tools that help to predict general trends from limited data. This includes:

- use of Weibull curves (a graphical method of portraying a distribution of malleable shape determined by the underlying data) for predicting the "maximum likelihood" distribution of expected star ratings from limited though high quality data
- standard food modelling techniques for predicting dilution effects on nutrient content
- standardised residuals from linear regression to predict the sensitivity of star ratings to the different nutrients, for example within food categories. When

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[14] Talati Z, Pettigrew S, Kelly B, Ball K, Dixon H, Shilton T. Consumers' responses to front-of-pack labels that vary by interpretive content. Appetite 2016; 101:205–213

[15] FoPL Secretariat, 2018, Guide for Industry to the Health Star Rating Calculator, v. 6, available at www.healthstarrating.gov.au/internet/healthstarrating/publishing.nsf/Content/guide-for-industry-document

[16] Addinsoft, 2017, XLSTAT 2017: Data Analysis and Statistical Solution for Microsoft Excel

regression is used, 95% confidence intervals or 95% confidence ellipses are used to provide readers with an estimate of the predictive reliability of the underlying data.

Further details of all analysis types and techniques may be obtained from TAG.

Results

Option 3 (shift products at the lower end of the HSR range down) was the only option modelled.

Figure 1 showed the current distribution of confectionery Star Points in the TAG database, with equivalent HSRs spread between 0.5 and 2.0. Figure 3 demonstrates the effect of shifting lower scoring products downwards and indicates that this downward shift results in a distribution for confectionery of between 0.5-1.5 HSRs.

Figure 3: Star Points for confectionery when lower scoring products are shifted downwards (option 3)

Options summary

Table 5: Outline of options 1 – 5 to address identified issues with confectionery products

Option	Option description	Benefits	Disadvantages	Comments
1	No change to category	No change to existing labels	Will not address concerns raised	
2a	No HSR on confectionery	• Avoids comparisons to other products in category 2 • Addresses concerns about products with limited positive nutritional value receiving 'health' stars • Addresses concerns about high sugar products receiving 'stars'	• Does not align with intent of HSR system to improve information for consumers • Category already has good uptake • Difficult to define scope of confectionery for industry • Does not align with social marketing advice on using the HSR	510 confectionery products currently display the HSR system
2b	Limit to energy icon only	• Avoids comparisons to other products in category 2 • Allows simple comparison between all confectionery products based on energy • Addresses concerns about products with limited positive nutritional value receiving 'health' stars • Addresses concerns about high sugar products receiving 'stars'	• The energy icon may not be sufficiently interpretive for consumers • Doesn't align with social marketing advice on using the HSR • Difficult to define scope of confectionery for industry	337 (66%) of confectionery displays only the energy icon and not the HSR itself.
2c	Policy decision to remove confectionery from category 2 and cap (e.g. at 2 HSR)	• May address concerns about products with limited positive nutritional value receiving 'health' stars • Addresses concerns about high	• Difficult to define scope of confectionery for industry • May not align with intention of system to provide differentiation, noting that there is already a	• Would require technical changes to the HSR Calculator • Creates a precedent for the treatment of discretionary products

			narrow range of HSRs	• A small minority of products in this category display a HSR ≥2
		sugar products receiving 'stars'	• May result in the HSR being removed from products	
2d	Policy decision to remove confectionery from category 2 and assign all a single HSR (e.g.1)	• May address concerns about products with limited positive nutritional value receiving 'health' stars • Addresses concerns about high sugar products receiving 'stars'	• Difficult to define scope of confectionery for industry • May result in the HSR being removed from products • May not align with intention of system to provide differentiation, noting that there is already a narrow range of HSRs	• Would not require technical changes to the HSR Calculator • Creates a precedent for the treatment of discretionary products • A majority of products in this category already display a HSR ≤1
3.	Shift products at lower end of HSR scale in Category 2 down	• Would address concerns, including around other products with low nutritional value in Category 2 • Improves demarcations between discretionary and FFG foods.	• All Category 2 products would need to be rescaled • Would require changes to existing scores	• Modelling provided • Would affect all products at lower end of Category 2 • HSRs would decrease by 0.5 • Provides an implicit cap to HSRs for this category
4.	Increase the impact of high sugar on HSR e.g. increase baseline points assigned to sugars	• May address concerns about high sugar products receiving 'stars' • Could remain in Category 2 • Simple change to technical component	• HSR calculator moves further away from NPSC	• Not modelled in this paper • Linked to other TAG work
5.	Separate Category 2 into four 'FFG' and one 'discretionary' food categories and then rescaling the 'discretionary' category	• May address concerns, including around other food products/categories • Would mitigate comparisons between FFG and discretionary foods • May provide greater differentiation	• Would require remodelling all Category 2 products • Would require changes to existing scores for a large number of products • Would require significant definitional work	• Unable to be modelled at present • Would affect all products currently in Category 2

Discussion and conclusions

A clear (if implicit) intention of the HSR system is to have the system displayed by as many products as possible. In addition, many submissions to the five year review indicate that consumers would prefer to see HSRs on all eligible products.

As such, TAG considers that confectionery should continue to display the HSR graphics, with the key issue being whether it is appropriate for confectionery to receive HSRs up to 3.5.

Other than status quo, there are three options available which support the intent of the HSR system and may improve alignment with the intent of dietary guidelines to reduce consumption of foods high in energy and total sugars:

- Option 3 - low-scoring products in Category 2 could be shifted further towards the lower end of the HSR scale, effectively decreasing HSRs by 0.5. This is expected to impact products at the bottom of this category, such as confectionery, but not products with HSR >3. This would provide an implicit cap to HSRs for confectionery
- Option 4 - increase the impact of high sugar in the HSR Calculator. This work is being considered by TAG separately and may complement any decision on confectionery.
- Option 5 - separate FFG and discretionary categories, which is technically feasible. This option can only be considered/modelled once total system enhancements are being deliberated.

APPENDX 1: Scatter plots showing component drivers for confectionery

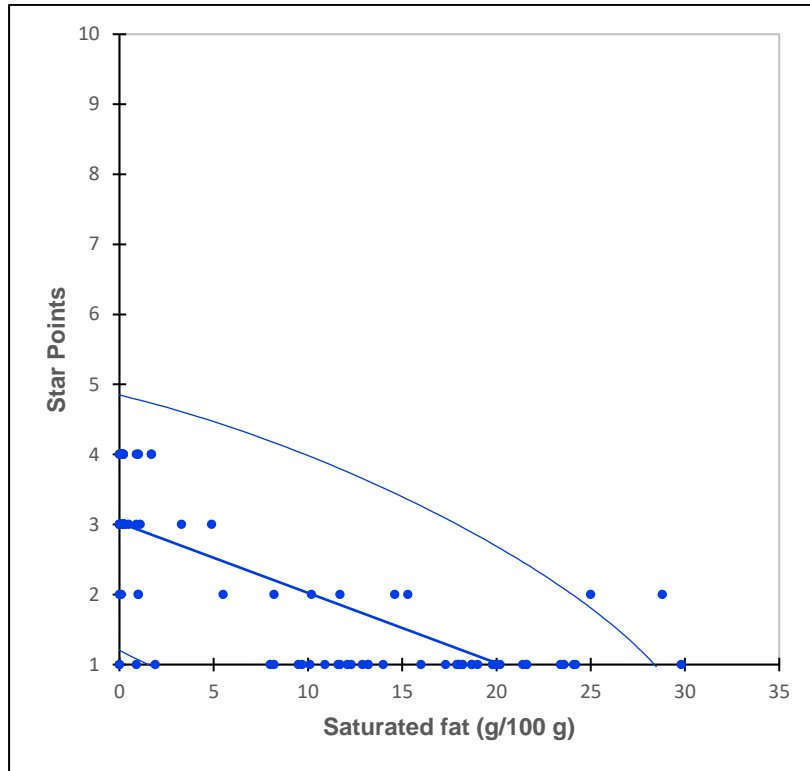Note: Lines on figures in this Appendix show the trend and ellipses show the 95% confidence interval.

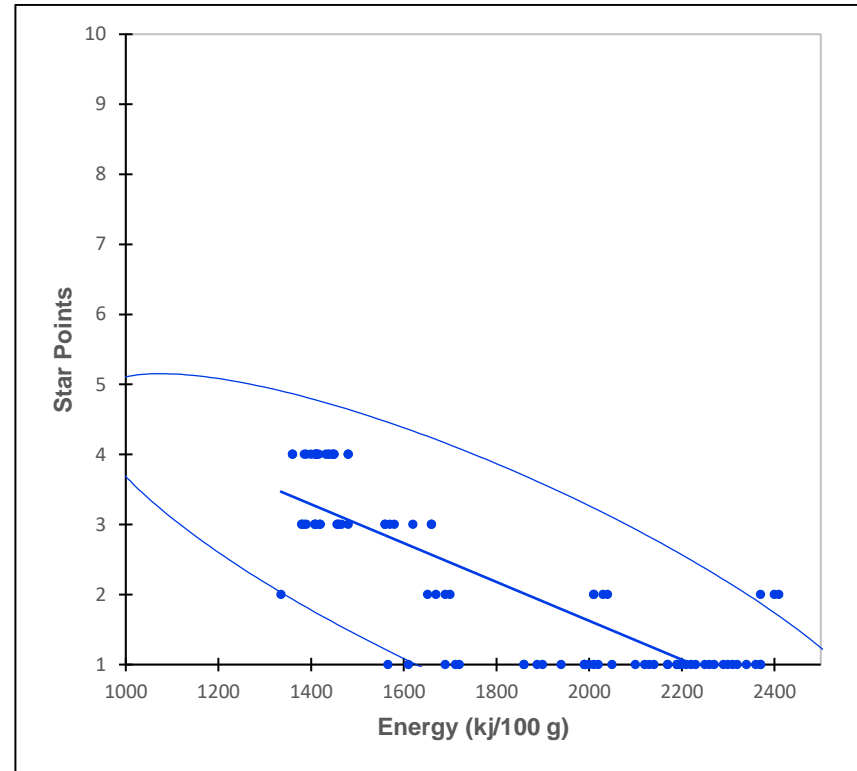*Figure 4: Scatter plot for saturated fat*
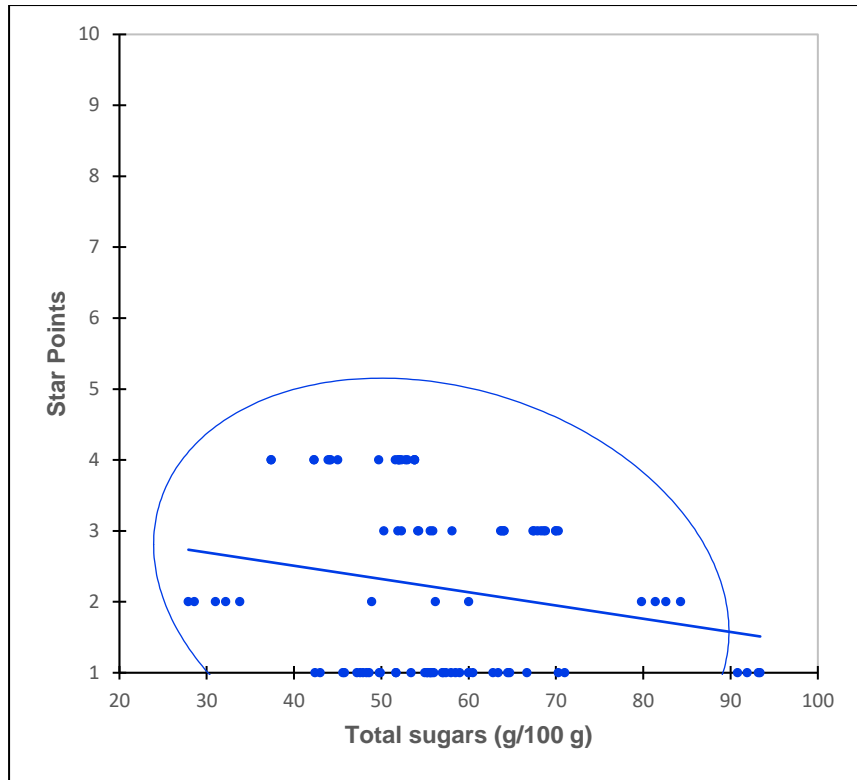
Figure 5: Scatter plot for energy

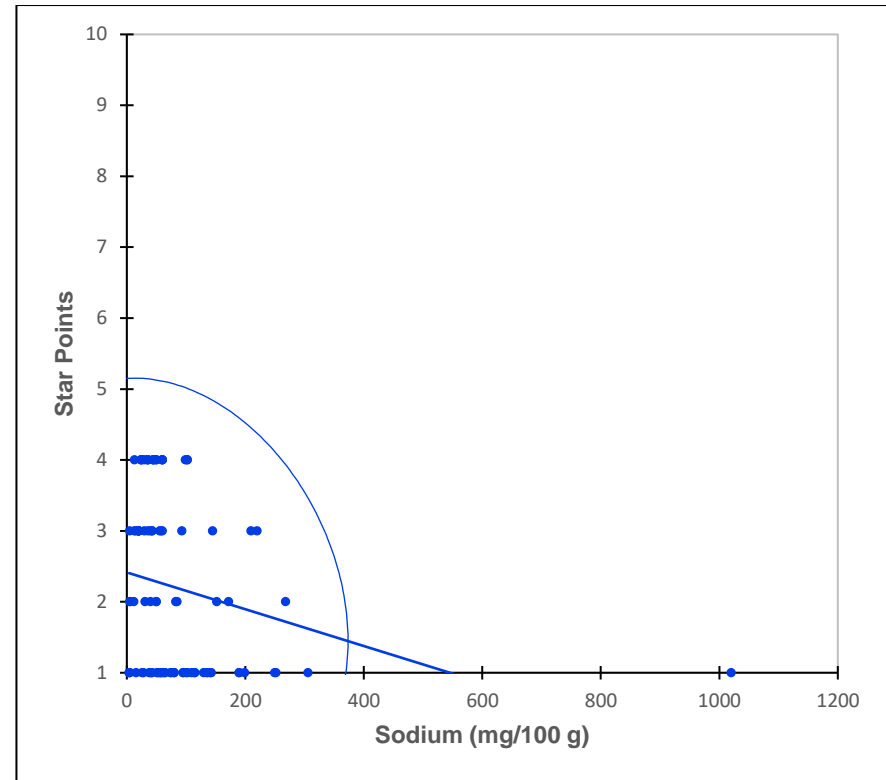*Figure 6: Scatter plot for total sugars*
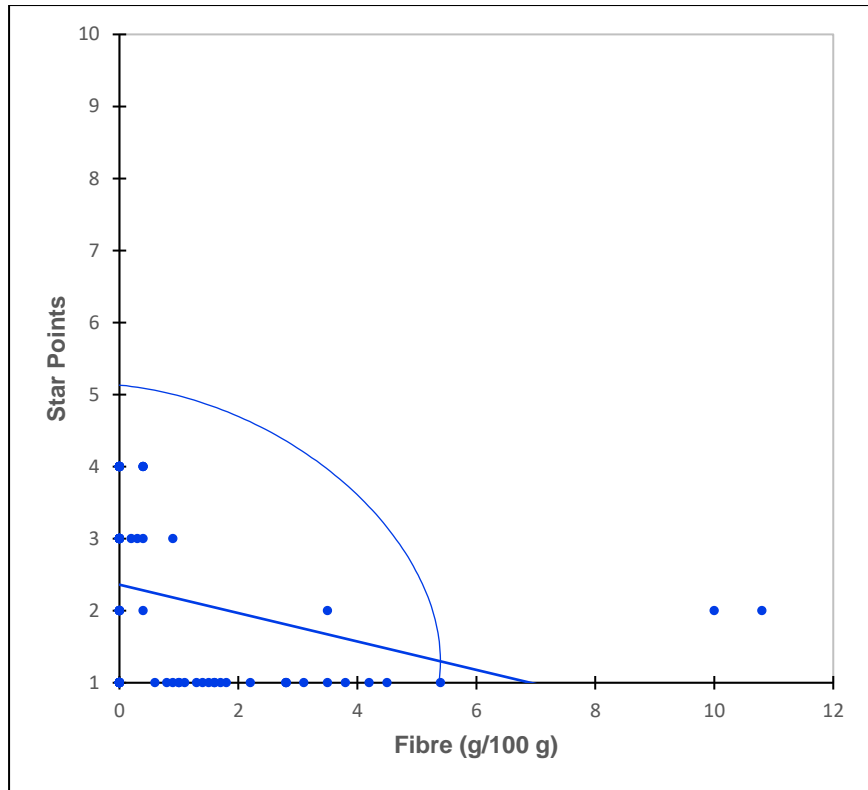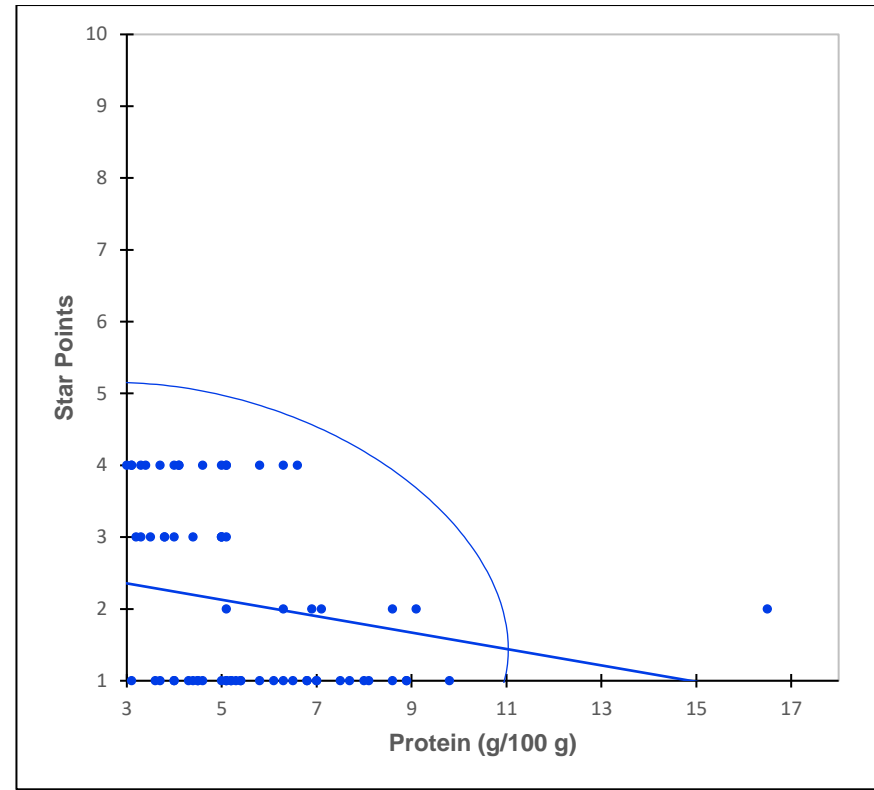

Figure 7: Scatter plot for sodium

Figure 8: Scatter plot for fibre

Figure 9: Scatter plot for protein