

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

HSR Technical Advisory Group (TAG)

Wholegrain

Contents

Summary	3
Problem Definition.....	4
Definition and quantification.....	4
Issues identified in five year review	5
Alignment with system objectives and policy.....	6
Consideration of issues raised in submissions	8
Rationale for inclusion of wholegrain as an HSR component.....	8
Restriction to relevant categories.....	8
How should wholegrain in food be accounted for?.....	8
Additional analyses undertaken.....	9
Summary.....	12
Industry data for wholegrain products.....	12
Options Summary.....	14
Conclusion	15
APPENDIX 1: Modelling of the impact of options 1 and 2 for cereal foods	16

Summary

Both the Australian Dietary Guidelines (ADG) and New Zealand Eating and Activity Guidelines (NZEAG) promote the consumption of wholegrain cereals, but the HSR system algorithm does not directly account for wholegrain content.

Stakeholders raised the issue of the lack of a clear and obvious HSR benefit for a food containing wholegrains compared to a similar, more refined product, (for example white bread compared to wholegrain bread was stated to be a half star difference).

In considering technical solutions to this issue, it is noted that there is a definition of wholegrain in the Australia New Zealand Food Standards Code (the Code), which is the same as that used in the widely accepted Industry Code of Practice to regulate wholegrain content claims for food.

Three options were considered:

Option 1 is to do nothing. This leaves the issue not directly addressed by the HSR system, but front of pack wholegrain content claims can be made under the Industry Code of Practice.

Option 2 is to account for wholegrain cereal content using the fruit, vegetable, nut and legume (FVNL) modifying points, raising the HSR for foods containing wholegrain cereals). Inclusion of wholegrain as a FVNL component will require a relatively small adjustment to the current algorithm in a subset of one HSR category which has a small HSR impact. However it would better distinguish wholegrain foods from their refined grain counterparts, and increases the alignment of the HSR system with dietary guidelines in Australia and New Zealand. In its most effective and least disruptive form, the solution requires the formation of another HSR food category (a subgroup of Category 2) where HSR points are rescaled. Therefore this option is technically possible, but results in a substantially more complex HSR algorithm.

Option 3 is to apply option 2 but to also disallow foods that gain wholegrain points from also gaining fibre points. Discounting fibre points has a negative impact on HSR eligibility that is out of proportion to the positive impact of consideration of wholegrain. It is noted that many discretionary foods gain eligibility for additional stars because of their fibre content, however so do FFG (five food group) cereal foods. Therefore this option is again technically possible, but initially produces a poorer result for many wholegrain and other foods and pragmatically results in a substantially more complex HSR algorithm.

Problem Definition

Definition and quantification

Wholegrain is defined in the Australia New Zealand Food Standards Code (the Code)¹ as: the intact grain or the dehulled, ground, milled, cracked or flaked grain where the constituents—endosperm, germ and bran—are present in such proportions that represent the typical ratio of those fractions occurring in the whole cereal, and includes wholemeal (Standard 1.1.2–3).

Whole grain is not a nutrient but it might be considered a proxy for increased nutrient concentration. For example, wholegrains are typically higher in dietary fibre and some micronutrients than refined cereal counterparts (e.g. white bread contains 2.8 g/100 g fibre and 1.5 mg iron/100 compared to 6.3 g/100 g and 2.1 mg/100 g respectively in wholemeal bread).²

It is not possible to determine the content of wholegrain in food by analysis.

The HSR algorithm includes another component which is not a nutrient – i.e. fruit, vegetable, nuts and legumes (FVNL). For some grains widely used in cereal containing foods (e.g. corn, oats) almost all usage would be defined as wholegrain, because the grain is generally not refined.

The HSR system does not directly include any algorithmic consideration for foods containing wholegrain to modify their star points. However a wholegrain food may achieve a higher HSR than it otherwise would through the use of fibre modifying points as a proxy. Therefore under the current HSR system, the perceived superiority of wholegrain foods does not result in sharp distinction in HSR compared to similar foods where the grain content is not wholegrain.

Consumption data: grain food and wholegrains

Australia

The Australian Bureau of Statistics (ABS) Australian Health Survey (AHS) 2011-12 found that, on average, Australians aged two years and over consumed around 4.5 serves of grain (cereal) foods. Only 30% of Australians met their recommended guideline for grain foods. Males were more likely to meet these guidelines than females (35% compared with 25%).³

The ABS used the ADG⁴ definitions of a standard serve of grain (cereal) food as 500 kJ or:

- 1 slice (40 g) of bread
- ½ cup (75-120 g) cooked rice, pasta, noodles, barley, buckwheat, semolina, polenta, bulgur or quinoa
- ¼ cup (30 g) muesli
- 3 (35 g) crispbreads.⁵

¹ Food Standards Australia New Zealand (2015) *Australia New Zealand Food Standards Code Standard 1.1.2 – Definitions used throughout the Code*. Available at <https://www.legislation.gov.au/Details/F2017C00715>.

² NUTTAB 2010 Online Searchable Database, Food Standards Australia New Zealand. <http://www.foodstandards.gov.au/science/monitoringnutrients/nutrientables/nuttat/Default.aspx>. Records 02B10546 and 02B10548.

³ Australian Bureau of Statistics (2017). *Australian Health Survey: Consumption of Food Groups from the Australian Dietary Guidelines, 2011-12 – Key Findings*. Available at: <http://abs.gov.au/ausstats/abs@.nsf/Lookup/4364.0.55.012main+features12011-12>

⁴ National Health and Medical Research Council (2013) *Australian Dietary Guidelines*. Canberra:National Health and Medical Research Council. NHMRC Page 144. https://www.nhmrc.gov.au/_files_nhmrc/file/publications/n55_australian_dietary_guidelines1.pdf

⁵ Australian Bureau of Statistics (2017). *Australian Health Survey: Consumption of Food Groups from the Australian Dietary Guidelines, 2011-12 – Grain (Cereals)*. Available at: <http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/4364.0.55.012~2011-12-Main%20Features~Grains~16>

The ABS defines wholegrain as “foods that use every part of the grain (cereal).”⁶

On a given day in 2011-12, 34% of all grain foods consumed by Australians were wholegrain or high fibre products. Wholegrains or high fibre made up over half of all grains (55%) consumed by persons aged 71 years and over. This was double the proportion of wholegrains or high fibre consumed by adolescents aged 14-18 years (22% of total grain foods).⁷

A 2017 analysis⁸ of the same dietary survey, using a specifically constructed wholegrain food composition data base, found the median daily intake of wholegrain to be 21 g for adults (19-85 years) and 17 g for children/adolescents (2-18 years). A recommended daily target has been suggested to be 48 g for Australians 9 years and over.⁹ The median daily intake of wholegrains was lower than the recommended daily target for all age groups, however median daily intake was highest in people over the age of 70 years (at 34 g).

New Zealand

The 2008/09 New Zealand Adult Nutrition Survey was carried out from October 2008 to October 2009. A total of 4721 adults aged 15+ years participated, including 1040 Maori and 757 Pacific peoples.¹⁰

The survey found that the principal source of dietary energy in New Zealand adults aged 15 years and over was the *Bread* group, contributing 11%, followed by *Grains and pasta* (7%). While there is no data specifically for wholegrain intake in New Zealand, the 2008/09 Survey found that 10–14% of adults usually ate heavy grain bread, which is the bread type with the most wholegrains. Most adults ate more refined bread: 25–30 % chose white bread (which contains no wholegrain), and 50% ate light-grain breads (which contains varying levels of wholegrain, usually low amounts).¹¹

Issues identified in five year review

The HSRAC have requested that the FVNL component of the HSR calculator be considered for addition of components which may include wholegrains.

During consultation, some stakeholders have noted that, compared to white breads, the star ratings for wholegrain breads achieve only a minor (half star) increase which is inconsistent with the perceived health-promoting qualities of the food.

⁶ Australian Bureau of Statistics (2017). *Australian Health Survey: Consumption of Food Groups from the Australian Dietary Guidelines, 2011-12 – Grain (Cereals)*. Available at: <http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/4364.0.55.012~2011-12~Main%20Features~Grains~16>

⁷ Australian Bureau of Statistics (2017). *Australian Health Survey: Consumption of Food Groups from the Australian Dietary Guidelines, 2011-12 – Key Findings*. Available at: <http://abs.gov.au/ausstats/abs@.nsf/Lookup/4364.0.55.012main+features12011-12>

⁸ Galea LM, Beck EJ, Probst YC, Cashman CJ (2017). Whole grain intake of Australians estimated from a cross-sectional analysis of dietary intake data from the 2011-13 Australian Health Survey. *Public Health Nutrition* **20**, 2166-2172.

⁹ Griffiths T, Nestel P (2006). Developing a target for daily wholegrain intake for Australians. *Food Australia* **58**, 431-433.

¹⁰ New Zealand Ministry of Health (2015) *A Focus on Nutrition: Key findings from the 2008/09 NZ Adult Nutrition Survey*. Available at: <https://www.health.govt.nz/publication/focus-nutrition-key-findings-2008-09-nz-adult-nutrition-survey>

¹¹ New Zealand Ministry of Health (2011) *A Focus on Nutrition: Key findings from the 2008/09 NZ Adult Nutrition Survey- 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

Alignment with system objectives and policy

Linkages with other TAG work and issues raised in submissions

Issues and suggested changes relating to wholegrain may impact on many of the foods containing cereals including bread, breakfast cereals, pastas and rice, muesli bars, biscuits and other snack foods. Approaches to allow wholegrains to be counted as FVNL in discretionary foods may be inconsistent with proposals to disallow the consideration of positive HSR components in discretionary foods such as salty snacks.

Conceptually, this issue may relate to the issue of juices vs whole fruit where many stakeholders felt that whole fruit should have a higher HSR than the extracted 100% fruit juice. To achieve this would appear to require adjustments to the HSR algorithm. Similarly some stakeholders proposed that wholegrain should be eligible for a higher HSR than the refined cereals prepared from them.

Issues and suggested changes relating to wholegrain may be linked to work focussed on fibre content. To some extent, refining cereal results in a lower fibre content; providing HSR benefit for wholegrain and for fibre potentially double counts the food characteristics. However, the fibre content of wholegrains vary considerably, as does the reduction that refining imposes.

Dietary guidelines

The 2013 ADG¹² recommend Australians eat a variety of grain foods, 'mostly wholegrain &/or high cereal fibre varieties'. The placement of 'and/or' in this Guideline statement implies that high cereal fibre grain foods and grain foods that include wholegrain are equally valuable to be used to provide most of the grain intake, and that one may substitute for another. A further implication is that added fibre is a desirable food characteristic (i.e. beyond the 'natural fibre content').

The NZEAG are perhaps less ambiguous in promoting the use of wholegrain, stating: 'Enjoy a variety of nutritious foods every day including ... grain foods, mostly wholegrain and those naturally high in fibre' and recommends that adults eat at least 6 servings of grain foods per day.¹³ The guidelines refer to the Code definition of wholegrain: *wholegrain means the intact grain or the dehulled, ground, milled, cracked or flaked grain where the constituents—endosperm, germ and bran—are present in such proportions that represent the typical ratio of those fractions occurring in the whole cereal, and includes wholemeal.*¹⁴

¹² National Health and Medical Research Council (2013) Australian Dietary Guidelines. Canberra:National Health and Medical Research Council. NHMRC Page 144.

https://www.nhmrc.gov.au/_files_nhmrc/file/publications/n55_australian_dietary_guidelines1.pdf

¹³ New Zealand Ministry of Health (2015) *Eating and Activity Guidelines for New Zealand Adults* (2015) Available at: https://www.health.govt.nz/system/files/documents/publications/eating-activity-guidelines-for-new-zealand-adults-oct15_0.pdf

¹⁴ Food Standards Australia New Zealand (2015) *Australia New Zealand Food Standards Code – Standard 2.1.1 – Cereal and cereal products* Available at: <https://www.legislation.gov.au/Details/F2015L00420>

Nutrient Profiling Scoring Criterion (NPSC)

Wholegrain quantification is not part of the NPSC

Nutrition labelling requirements

Declaration of wholegrain content is not required on food packaging, except where wholegrain is a characterising ingredient when the percent wholegrain must be quoted in the ingredient list. Dietary fibre is not a mandatory element of Nutrition Information Panels.¹⁵

There is no standard within the Code to regulate the use of wholegrain content claims to describe the amount of wholegrain in different foods.

Industry Code of Practice

A voluntary Code of Practice (COP) for Whole Grain Ingredient Content Claims was developed in July 2013 by the Grains & Legumes Nutrition Council (GLNC) which is intended to guide the use of wholegrain ingredient content claims on food labels in Australia and New Zealand. The definition of wholegrain used by the GLNC is: *Whole grain means the intact grain or the dehulled, ground, milled, cracked or flaked grain where the constituents – endosperm, germ and bran – are present in such proportions that represent the typical ratio of those fractions occurring in the whole cereal, and includes wholemeal.* This definition is identical to the Food Standards Code definition.

Under the GLNC COP, the minimum per serve content of wholegrain to allow an acknowledgement that a product contains wholegrain is 8 g per manufacturers serve (i.e. source of wholegrain). Tiered stronger content statements are permitted at 16 g per manufacturers serve and above (i.e. high in wholegrain) and 24 g per manufacturers serve and above (i.e. very high in wholegrain). The GLNC (in 2006) has facilitated the development of a Daily Target Intake for wholegrain of 48 g per day for adults and children above the age of 9 years.

'Pseudo grains' such as quinoa, amaranth, and buckwheat are considered 'wholegrains' for the purpose of the GLNC COP because of their nutritional similarity and similarity of use compared to true grains. Seeds, including chia, are not. Corn that is harvested when the seeds are dry is considered a grain; sweetcorn which is harvested prior to maturity is considered a vegetable.

Declaration of wholegrain content is not required on food packaging, except where wholegrain is a characterising ingredient when the percent wholegrain must be quoted in the ingredient list.

¹⁵ Australia New Zealand Food Standards Code (2017). Standard 1.2.8 Nutrition Information Requirements. <https://www.legislation.gov.au/Series/F2015L00395>

Consideration of issues raised in submissions

Rationale for inclusion of wholegrain as an HSR component

The rationale for explicitly including 'wholegrain' in the formulation of the HSR is that they are promoted by the dietary guidelines of both Australia and New Zealand, and their use is generally and widely understood to result in a 'healthier' food than the more refined grain alternative.

Therefore from the public perception, an algorithm component reflecting 'wholegrain might be expected to contribute to a higher HSR. It is likely that the feeling for this will be stronger for FFG (five food group) foods such as bread, and perhaps less so for clearly discretionary foods such as biscuits.

The NZEAG statements include 'Choose and/or prepare foods and drinks ... that are mostly 'whole' and less processed.' The concept of 'wholegrain' is one aspect of promotion of whole and less processed food, however the Code definition of wholegrain does not require that the wholegrain be less processed (or be 'whole) – only that it has all of the components of the grain in their original wholegrain proportions. There are substantial benefits to aligning definitions used in the HSR algorithm with definitions used by the Code.

Restriction to relevant categories

Foods outside category 2 are generally not significant sources of grain food and it could be argued that there is little nutritional difference or health benefit resulting from small amounts of grain food being wholegrain or not (for example muesli in yoghurt combinations). From a pragmatic point of view, discrimination of foods on the basis of wholegrain content will only be modelled for category 2 foods for the purposes of this paper.

How should wholegrain in food be accounted for?

FVNL content currently includes coconut, spices, herbs, fungi, seeds and algae content. FVNL can provide up to 8 'V' (or beneficial) points starting at 25% of weight for concentrated FVNL and 40% of weight for FVNL (not concentrated).

Fibre content might be considered to act as a proxy for wholegrain content, however the correlation is poor across grain foods (see Figure 1 in Appendix 1) because wholegrains vary substantially in their fibre content. Independently to FVNL, fibre can provide up to 15 beneficial points (F points) starting at a fibre concentration of 1.0 g/100g and rising to 20 g/100 g or more.

The total of the final Star Points are used to assign a HSR according to a scale that varies by category of food. One final Star Point is contributed by 335 kJ/100 g, about 1 g saturated fat/100 g (at the lower end of the saturated fat scale because the relationship is non-linear), about 4.5 g sugar/100 g, about 90 mg sodium/100 g (low end of scale), 10% content of FVNL above 40% of weight (varies across scale), 1.6 g protein/100 g (low end of scale) or 0.9 g fibre/100 g (low end of scale). While it is instructive to keep these 'equivalences' in mind, it is clear that their relative magnitudes are not related to relative disease risk or recommended intakes (partly because they are applied to foods, not diets), and some of the factors are not independent of each other - saturated fat, sugar and protein contribute to energy intake for example. The utility of the HSR system relies largely on whether it discriminates between foods (strictly within the same category) in a way that is consistent with dietary guidance in Australia and New Zealand, and in agreement with how nutritionists (and the general public) think it should. If wholegrain were to be incorporated into the HSR system, it should address the currently identified issues (i.e. have a real effect), without disrupting other parts of the algorithm or being unnecessarily complicated.

A proposal that consideration be given to only allowing intact wholegrain (rather than refined components which are reformulated) to be eligible to contribute to wholegrain content was

initially attractive, but was not taken further. This suggestion to allow the inclusion of only intact wholegrain was intended to promote principles of consuming less processed foods (inherent in the NZEAG), however the definition is inconsistent with the Code definition of wholegrain, and the GLNC Code of Practice governing wholegrain content claims. It is also debatable whether an intact wholegrain component added as an ingredient remains an intact wholegrain component in the finished food, or the extent to which health impact differs. There are aspects of the dietary guidelines that are best actioned outside the HSR system.

Additional analyses undertaken

Methods

Three options were considered:

1. Option 1: do nothing (status quo) which leaves the issue unresolved
2. Option 2: account for wholegrain cereal content as a % of food added to the FVNL modifying points (raising the HSR for foods containing wholegrain cereals)
3. Option 3: as for option 2, but also disallow foods that gained V points from wholegrain to also gain fibre points.

The food composition database developed for the Technical Advisory Group (TAG) to model algorithm changes included 1258 foods for which wholegrain values had been provided by food companies, 362 of which were non-zero. Most of these foods did not have an appreciable amount of wholegrain, and it was therefore determined that algorithm modification testing should be restricted to the Australian Guide to Healthy Eating (AGHE) categories for FFG cereals and the relevant discretionary foods categories (see Table 1). Foods were categorised as FFG or discretionary based on the categorisation used by the ABS in the 2011-13 Australian Health Survey (AHS).¹⁶

There are 596 foods in the HSR FFG Cereal and Discretionary Foods categories, for which useable wholegrain data was received from food companies, 346 of which had a non-zero wholegrain content and 267 of which had a wholegrain content of 40% by weight or greater. Foods in other categories may include wholegrain cereals, but few at the level of 40% (not concentrated) that is proposed to trigger the scale for inclusion of FVNL offset points.

A proposed algorithm change was modelled by adding wholegrain content by % weight to the FVNL % content (where not concentrated) and using the existing scale to generate V modifying points. The FFG food categories in the modelled categories (as described in Table 1) were segregated and re-scaled independently of the other foods in the large HSR Category 2. The re-scaling of the FFG foods category was oriented towards stretching upward the upper end of the star point distribution while leaving foods rated 3 stars and lower at their original rating. In effect, this is intended to widen the gaps between wholegrain cereal foods and refined grain cereal foods.

¹⁶ Australian Bureau of Statistics (2014). *Australian Health Survey Users' Guide – Discretionary Foods*. Available at: <http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/4363.0.55.001Chapter65062011-13>

Table 1: AGHE categories included for modelling in relation to wholegrain

FFG Cereals	Discretionary Foods: cereals or cereal based products
Cereals - bread (n=78; all FFG)*	Bakery/cake mixes (n=11; all discretionary)
Cereals - breakfast (n=216; 210 FFG, 6 discretionary)	Biscuits (n=168; 41 FFG, 127 discretionary)
Cereals - pasta/flour/grains (n=36; all FFG)	Meals/meal bases (n=17; all FFG)
	Snacks (sweet and savoury) (n=71; 9 FFG, 62 discretionary)

*Number of foods in each category modelled, and whether they were defined 'FFG or discretionary by the ABS categorisation.

Results

FFG cereal foods of various types benefit significantly more from wholegrain content than do discretionary foods containing wholegrain. This is because they were independently scaled, but also because FFG cereal foods tend to contain more cereal. Notably, many of the foods in the modelled database had insufficient wholegrain to result in any change. While the average HSR change is shown for each category under each option, because the modelled database is small and of unknown representativeness, a better comparison is to examine the difference between similar products with different wholegrain contents.

Graphs are included in Appendix 1 which show the change in Star Point distributions under each option for the seven different food groups outlined in Table 1. Each graph gives the average change in HSR for the food group and the number of foods for which there was no HSR change. These results are summarised below.

Pasta, Flour and Grains group

The TAG database sample of foods for FFG Cereals - Pasta/Flour/Grains was dominated by rice (31 of the 36 foods). The Star Point distribution for the foods was substantially increased (i.e. shifted to higher values) by the wholegrain amendment, and was also increased after fibre content was discounted. Under the current algorithm, less than 10% of the foods are eligible for 4.5 or 5 stars; with the wholegrain amendment (option 2) almost 50% are eligible for the same rankings, and when fibre is discounted (option 3) more than 40% remain eligible.

Closer examination indicated that foods in this category either had no wholegrain, or had 97% or greater wholegrain, with the exception of 2 types of instant noodles (which had 11% wholegrain).

- All foods that were nearly entirely wholegrain in this category were moved to 5 stars following the wholegrain amendment.
- Of the 31 rice foods, 17 had no wholegrain and 14 had between 97 and 100% wholegrain. For the rice foods without wholegrain, the wholegrain amendment increased the stars awarded by one half star in 10 cases and did not increase them in the other 7 cases. For the rice foods that were almost entirely wholegrain, stars were increased by 1 in 9 cases, and one and a half in 5 cases.
- The three other pasta/flour/grain foods were 100% wholegrain and scored 5 stars prior to the wholegrain amendment.

FFG Cereals - Breakfast Cereals

FFG Cereals – Breakfast Cereals are advantaged by the wholegrain amendment (option 2) but disadvantaged by the discounting of fibre (by the loss of up to 2 stars) (option 3). This indicates the importance of the fibre points for this category to receive a higher HSR, although more than 25% of foods had no change in eligibility by the wholegrain amendment and the fibre amendment.

FFG Cereals - Bread

Examination of categories of bread showed:

- 10 white breads or bread rolls with a mean wholegrain content of 6%
- 27 mixed grain breads or bread rolls with a mean wholegrain content of 14%
- 4 rye breads with a mean wholegrain content of 15%
- 22 wholemeal or brown bread or bread rolls with a mean wholegrain content of 46%.

The current mean HSR for the white breads and bread rolls in the database is 3.9 stars, while for wholemeal or brown bread or bread rolls it is 4.2 stars. Under the wholegrain amendment (option 2), white bread or bread rolls increased by an average of 0.2 stars (4 breads increased by half a star), and wholemeal or brown bread or bread rolls increased by an average of 0.4 stars (16 breads increased by half a star). Under option 2, the difference in means for HSR between white and wholemeal or brown breads is half a star. From wholegrain content alone, only one of the white breads (i.e. 10%) reached the 40% wholegrain threshold, 2 of the mixed grain breads (7%), none of the rye breads (0%), and 17 of the wholemeal or brown breads (77%).

There was no change in the HSR under the wholegrain amendment (option 2) for 60% of the foods in the FFG Cereals - Bread category and the eligibility changed by only half a star for the others.

Removal of the fibre points (option 3) had a negative effect on eligibility for stars on almost 90% of foods.

Discretionary Foods – Snacks

The wholegrain amendment (option 2) had only a small positive change on Discretionary Foods – Snacks (as they remained in category 2), with only a quarter of foods improving their eligibility. HSR eligibility changed by at most half a star and the change applied to some extruded snacks, some muesli/cereal bars and some popcorn.

Interestingly, the discounting of fibre (option 3) resulted in a negative change to more than 83% of foods with eligibility changing by up to 1 and a half stars. After the amendment, none of the foods were eligible for any more than 3 and a half stars indicating that fibre points influence the more than 35% of this category that are currently eligible for 4 or more stars.

Discretionary Foods – Meal bases

There was little impact of either proposed amendment on this product group.

Discretionary Foods – Biscuits

24% of this category is classified as FFG rather than discretionary but the wholegrain amendment (option 2) only had a small effect on a small number of wheat-based savoury biscuits (3% of the foods in the category).

Discounting of fibre (option 3) had a negative impact on more than 50% of the foods, generally by half a star but up to 3 stars.

Discretionary Foods – Bakery/Cake Mixes

This group is dominated by plain pastry items and saw no change in HSR eligibility under the proposed wholegrain amendment, and a decrease of half a star for more than 50% of the foods under the fibre discounting (option 3).

Summary

In summary, the proposed wholegrain amendment (option 2) appears to provide a HSR benefit to foods containing a substantial amount of wholegrain in the FFG cereal groups, while having minor impact on only a few foods in the discretionary foods groups examined. The distinction by health stars between wholemeal and brown breads compared to white bread was only marginally increased (to half a star) although the modelled white breads vary from 3.5 to 4.5 stars and the wholemeal or brown breads from 4 to 5 stars under option 2. Some concern has been expressed about the possibility of added positive elements in the HSR algorithm masking the presence of negative elements (for example wholegrain content offsetting sodium or sugar content).

The additional fibre discount (option 3) had a substantial negative HSR effect on eligibility for HSR on particularly the FFG - breads group, the FFG - breakfast cereal group and the Discretionary - snacks group, and to some extent on the Discretionary - biscuits group and the Discretionary - bakery group.

Industry data for wholegrain products

An audit undertaken by the GLNC in 2017¹⁷ covered 456 total bread products (loaves, rolls, sandwich alternatives, flatbread, bakery breakfast), snack bars and breakfast cereals showed the following results for wholegrain content and for fibre content (Tables 2 and 3).

Table 2: Whole grain content of selected grain product categories, including eligibility to make wholegrain content claims

Product group	Average (g/serve)	Range (g/serve)	% Eligible for content claim (>8g/serve)	% (8 - < 16 g/serve)	% (16-<24 g/serve)	% 24g+/serve
Sliced loaves - Wholemeal/wholegrain (n=141)	24	2-75	67	18	14	35
Sliced loaves - Gluten free (n=21)	1	1-14	5	0	0	5
Total bread products (n=456)	10	0 - 75	28	7	6	14
Grain based bars (n=54)*	4.8	0.7-16.1	9.3	7.4	1.9	0
Muesli/oats based bars (n=94)**	13.5	5.6-27.9	74.5	47.9	23.4	3.2
Ready to eat cereals (n=171)^	21.0	4.8 - 47	61.4	18.1	20.5	22.8
Muesli, granola clusters (n=206)^	26.7	3.6 - 45	52.4	2.4	12.6	37.4
Hot cereal (n=91)^	33.2	20 - 100	93.4	0	6.6	86.8

*Whole grain not assessable for n=39; **Whole grain not assessable for n=14; ^ Whole grain not assessable for n=119 cereals

¹⁷Grains & Legumes Nutrition Council (2018) <https://www.glnc.org.au/resources/healthcare-professionals/>

Table 3: Fibre content of selected grain product categories, including eligibility to make dietary fibre content claims

Product	Average (g/serve)	Range (g/serve)	Eligible for content claim (2g+ /serve)	% (2 - < 4 g/serve)	% (4 - < 7 g/serve)	% 7g+ /serve
Sliced loaves - White (n=81)	3	1 - 7	62%	47	15	0
Sliced loaves - Wholemeal/wholegrain (n=141)	5	1 - 11	90%	32	47	11
Sliced loaves - Gluten free (n=21)	4	1 - 7	81%	48	24	10
Grain based bars (n=54)	2.4	0.1–10.4	53.7	38.9	7.4	7.4
Muesli/oats based bars (n=94)*	2.6	1.1–5.7	71.3	68.1	3.2	0
Legume bars (n=3)	2.9	2.5 – 3.5	100	100	0	0
Ready to eat cereals (n=171)^	9.5	1 – 34.1	73.1	38.0	26.9	8.2
Muesli, granola clusters (n=206)^	8.9	3.2–18.9	91.7	36.4	47.5	7.8
Hot cereal (n=91)^	10	3.4–18.3	91.2	54.9	34.1	2.2

*Fibre not on label for n=8; ^Fibre information not on the label for 26 cereals

The results for wholegrain content do not necessarily reflect the results for fibre content – wholegrain content does not appear to be a good proxy for fibre content. The tables do indicate that a large percentage of the products in the survey are able to make dietary fibre content claims, and wholegrain content claims on food packaging.

Options Summary

Table 4: Options to explicitly incorporate wholegrain into the HSR

Option number	Option	Benefits	Disadvantages
1	No change to the HSR algorithm to incorporate wholegrain content.	No precedent for other 'neglected' parts of the guidelines to be included in the HSR (less processing generally, polyunsaturated fat).	HSR system does not apparently account for wholegrain cereal, potentially undermining trust in system.
2	After the creation of an appropriate HSR cereals food category, include the capacity to count wholegrain content in the FVNL content for foods of this category. Wholegrain content can approach 100% for some foods, and most foods with a high wholegrain content contain little if any FVNL.	<p>Whole grain is recommended in dietary guidance and would now be included in the HSR algorithm.</p> <p>Minimal change to other aspects of the algorithm (because wholegrain content fits the FVNL paradigm of being a percentage of total weight).</p> <p>A standard definition of wholegrain consistent with the FSC might be used.</p> <p>'Non nutrients components are in the same part of the algorithm.</p> <p>Foods with a significant wholegrain cereal content have a small HSR advantage compared to an equivalent non wholegrain cereal food.</p> <p>If wholegrain content were included as an FVNL element, foods with a high wholegrain content would benefit by FVNL offset points to raise their HSR.</p>	<p>HSR algorithm is made more complicated.</p> <p>HSR algorithm has components that are nutrients, caloric value of nutrients, foods and now a form of foods.</p> <p>HSR algorithm requires more information that is not required to be declared on pack.</p> <p>HSR algorithm requirements and form drifts further from the NPSC (which does not include wholegrain).</p> <p>Potential inconsistency of definitions of wholegrain may be confusing.</p> <p>Fibre may be double counted in some cases (however this is similar to energy being included in the algorithm as well as energy containing nutrients – sugar, fat, protein).</p> <p>It may be possible to counteract HSR negative nutrients with an added positive HSR element.</p>
3	As for option 2, but dropping the points that could be additionally generated by fibre content	<p>As above</p> <p>Benefit of fibre not 'double counted' in addition to wholegrain</p>	As above

Conclusion

The inclusion of wholegrain as a component of the FVNL scoring is a relatively small adjustment to the current algorithm (although it also requires development of a new category) which appears to have a small impact towards the aim of better distinguishing, through improved health star rating, wholegrain foods from their refined grain counterparts. It may also increase the perceived alignment of the HSR system with dietary guidelines in Australia and New Zealand which explicitly recommend wholegrain cereal foods.

However, wholegrain content cannot be analysed in a food so the content information is reliant on the manufacturer. While there are standard definitions of wholegrain in the Food Standards Code and promoted by the GLNC which administers the Industry Code of Practice for wholegrain content claims, the definition of wholegrain content is inherently complex. Manufacturers already have the option of highlighting wholegrain content on the food labels provided content thresholds are reached.

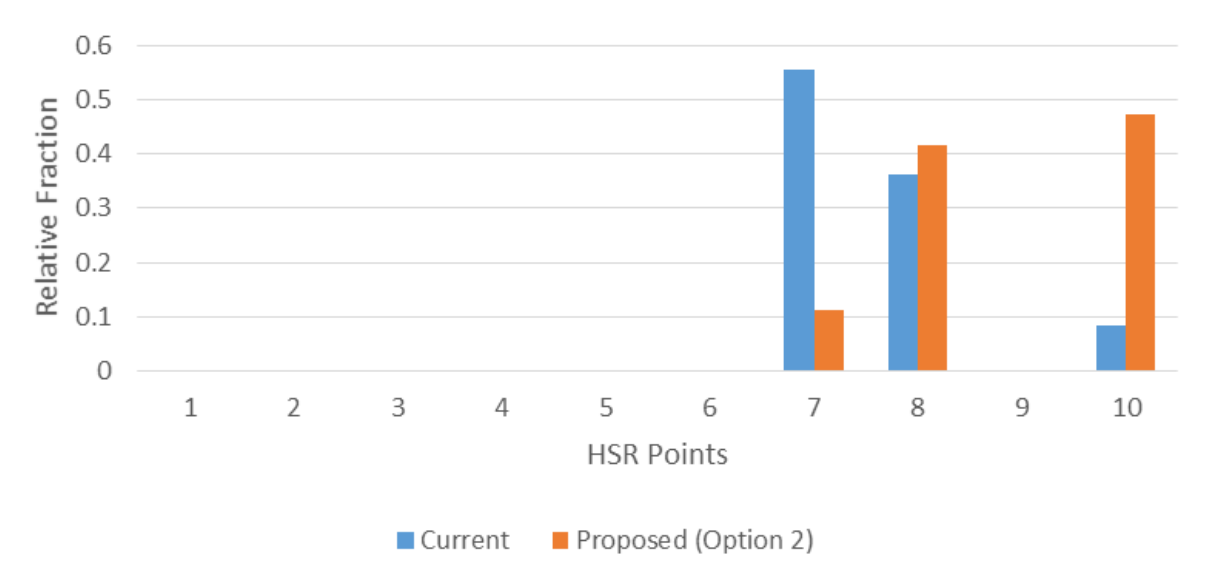
Discounting fibre points has a negative impact on HSR score that is out of proportion to the positive impact of consideration of wholegrain. It is noted that many discretionary foods gain eligibility for additional stars because of their fibre content, however so also do FFG cereal foods.

APPENDIX 1: Modelling of the impact of options 1 and 2 for cereal foods

A. FFG CEREALS: PASTA/FLOUR/GRAINS

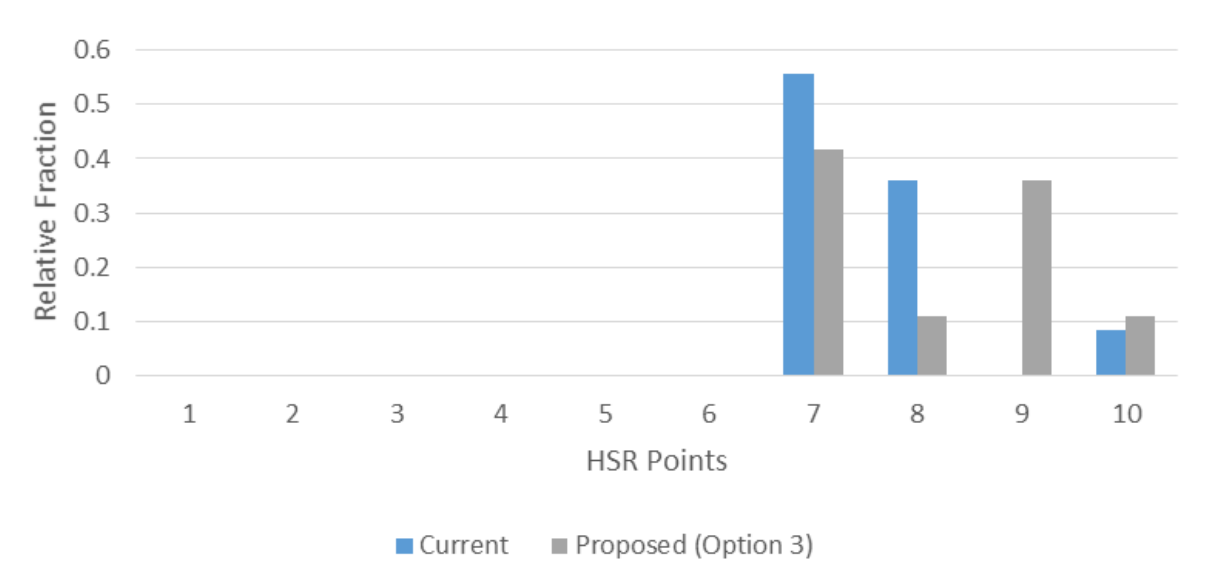
n= 31 foods are rice-based (i.e. 86%).

Wholegrain Amendment (Option 2):



The average HSR point change is + 1.2; range 0 to 3. There is no change in HSR points for 11 out of 36 products.

Wholegrain Amendment + Fibre Discounting (Option 3):

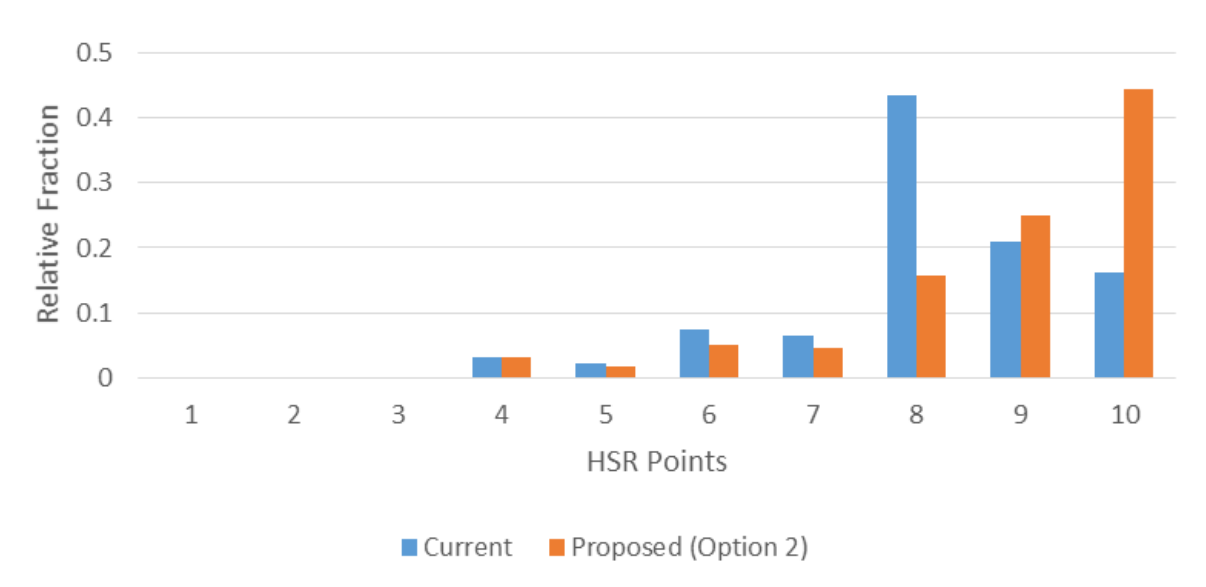


The average HSR point change is 0.56; range -1 to 2. There is no change in HSR points for 18 out of 36 products.

B. FFG CEREALS: BREAKFAST CEREALS

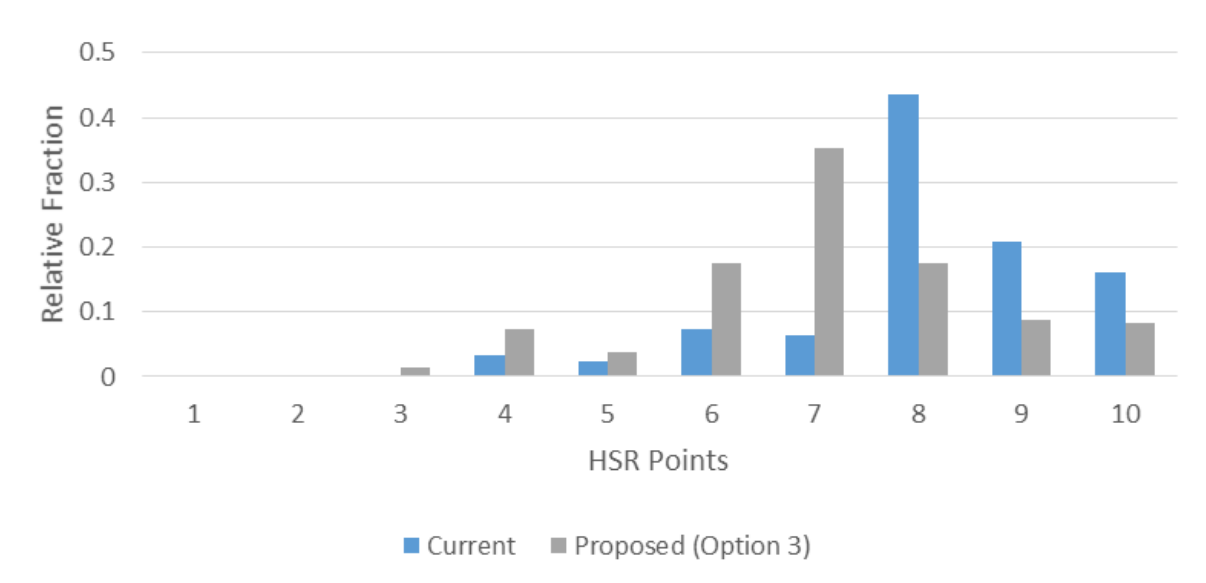
n=37 are porridge based.

Wholegrain Amendment (Option 2):



The average HSR point change is + 0.69; range 0 to 2. There is no change in HSR points for 90 out of 216 products.

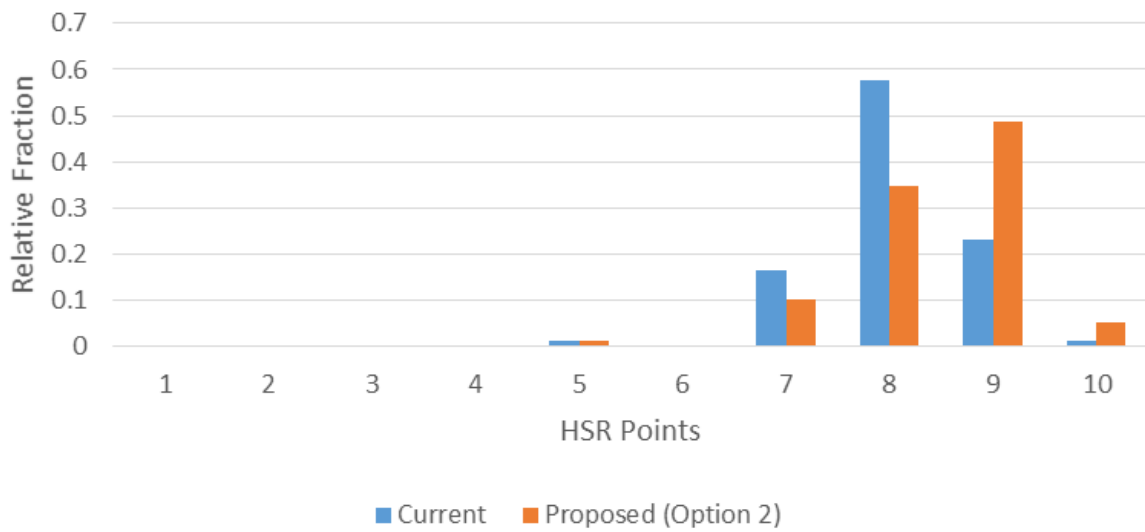
Wholegrain Amendment + Fibre Discounting (Option 3):



The average HSR point change is - 1.05; range -4 to 1. There is no change in HSR points in 60 out of 216 products.

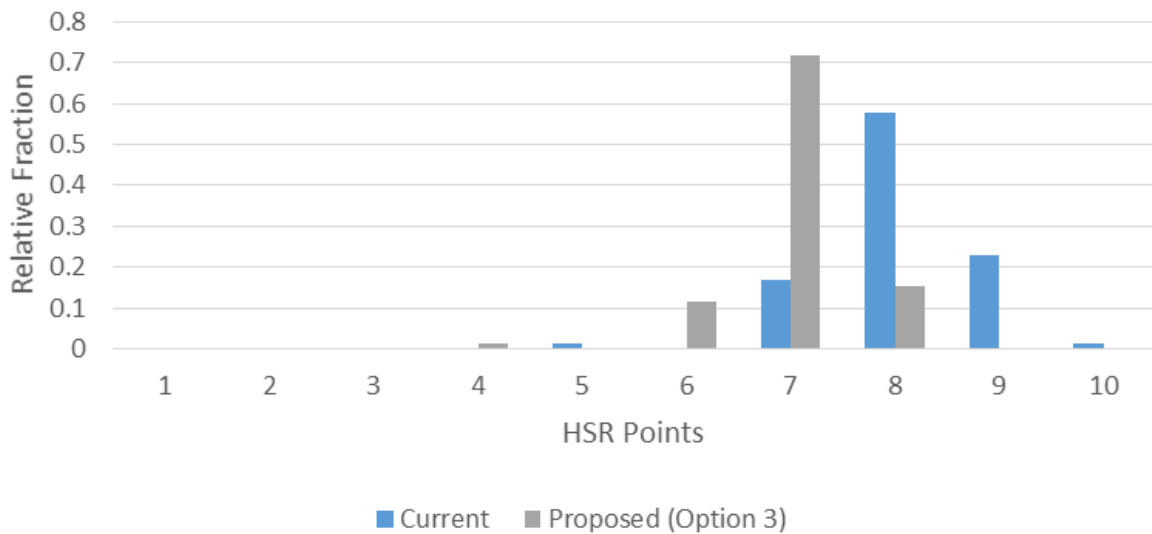
C. FFG FOODS: BREAD

Wholegrain Amendment (Option 2):



The average HSR point change is + 0.4; range 0 to 1. There is no change in HSR points in 47 out of 78 products.

Wholegrain Amendment + Fibre Discounting (Option 3):

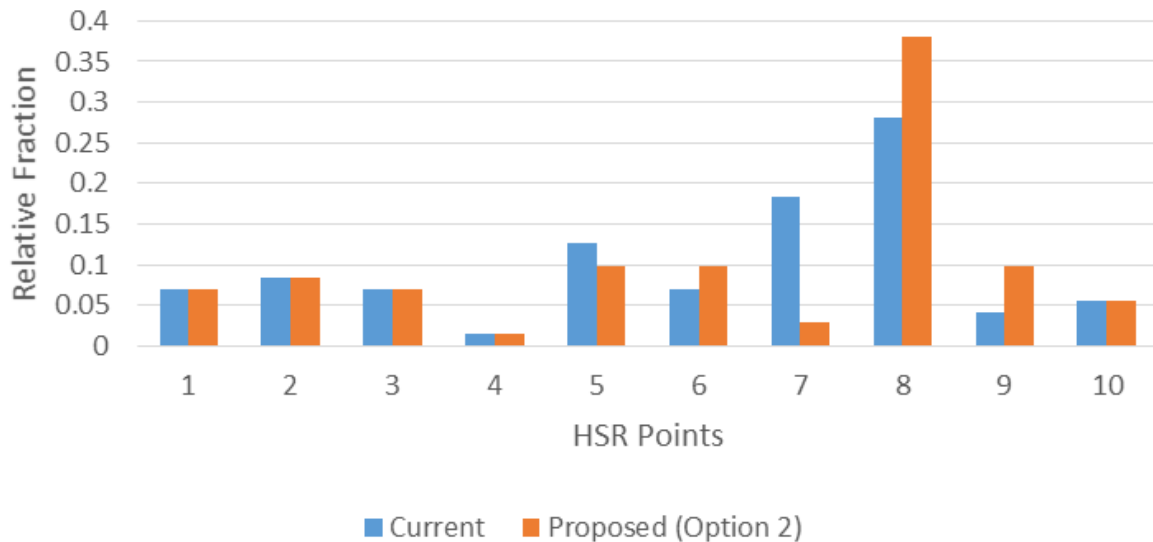


The average HSR point change is - 1.05; range -2 to 0. There is no change in HSR points in 8 out of 78 products.

D. DISCRETIONARY FOODS: SNACKS

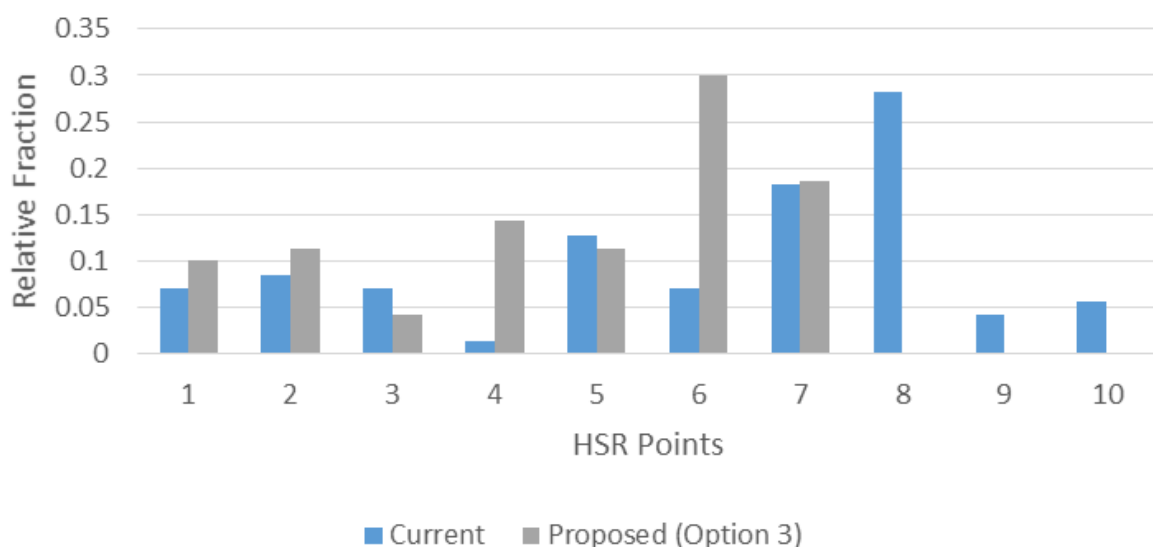
n=34 Muesli and cereal style bars.

Wholegrain Amendment (Option 2):



The average HSR point change is + 0.24; range 0 to 1. There is no change in HSR points for 53 out of 71 products. There is a + 1 HSR point for 9 extruded snacks, 4 popcorn, 4 muesli/cereal bars.

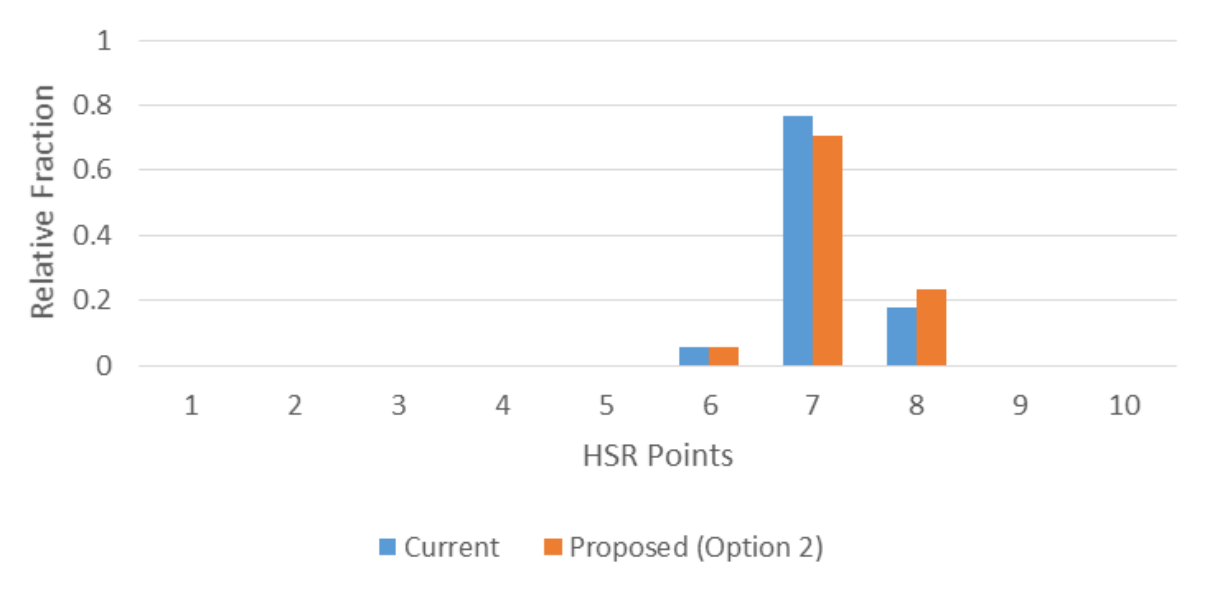
Wholegrain Amendment + Fibre Discounting (Option 3):



The average HSR point change is - 1.34; range -3 to 0. There is no change in HSR points for 12 out of 71 foods.

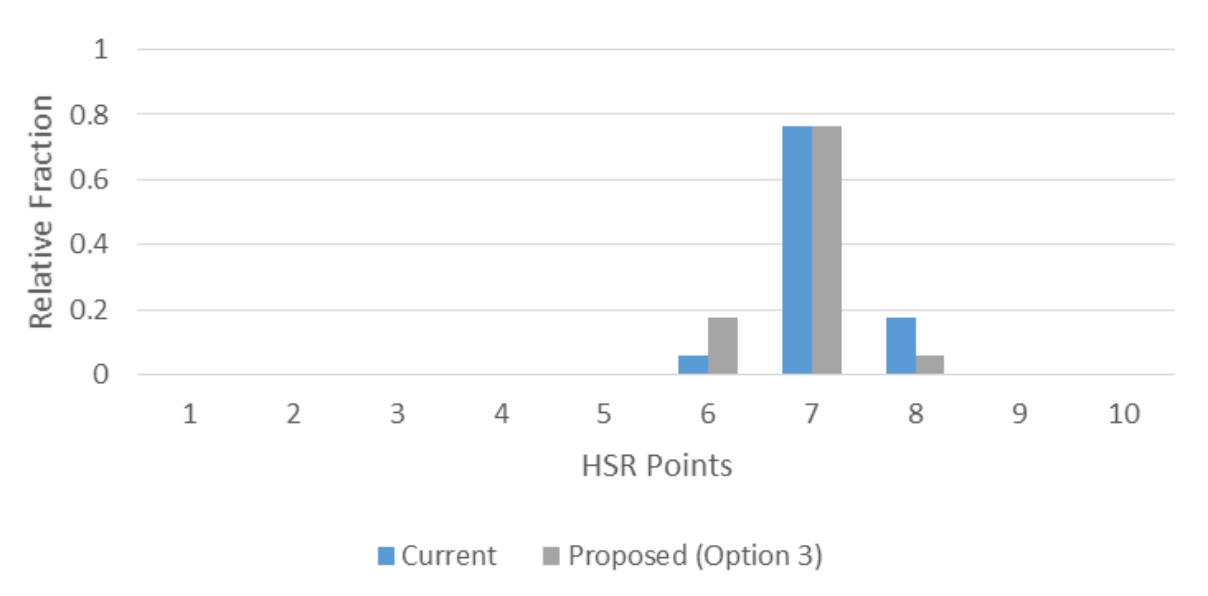
E. DISCRETIONARY FOODS: MEALS/MEAL BASES

Wholegrain Amendment (Option 2):



The average HSR point change is + 0.06; range 0 to 1. There is no change in HSR points for 16 out of 17 products.

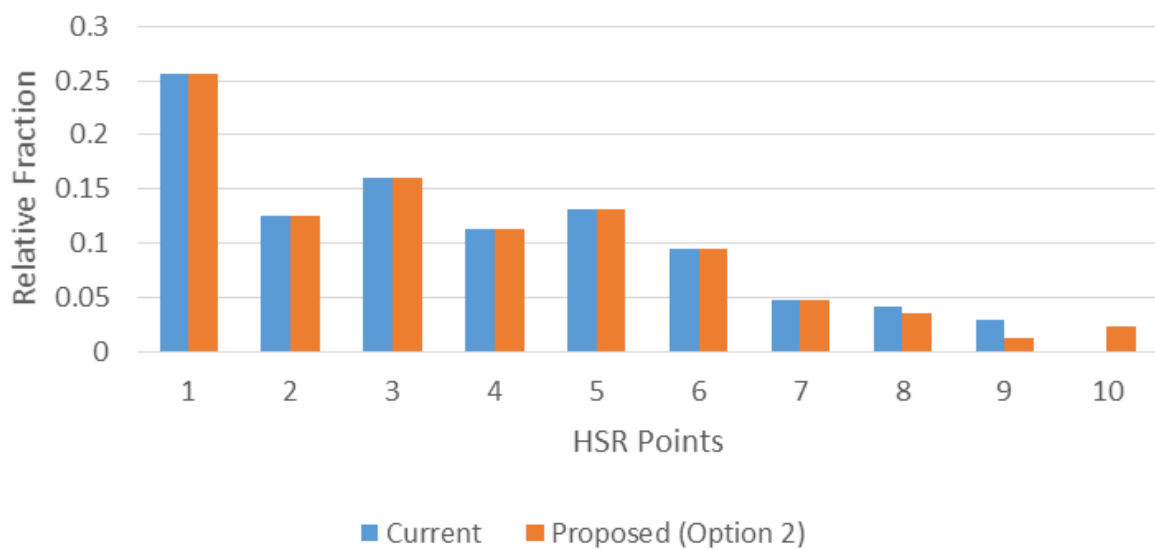
Wholegrain Amendment + Fibre Discounting (Option 3):



The average HSR point change is - 0.24; range -1 to 0. There is no change in HSR points for 13 out of 17 products.

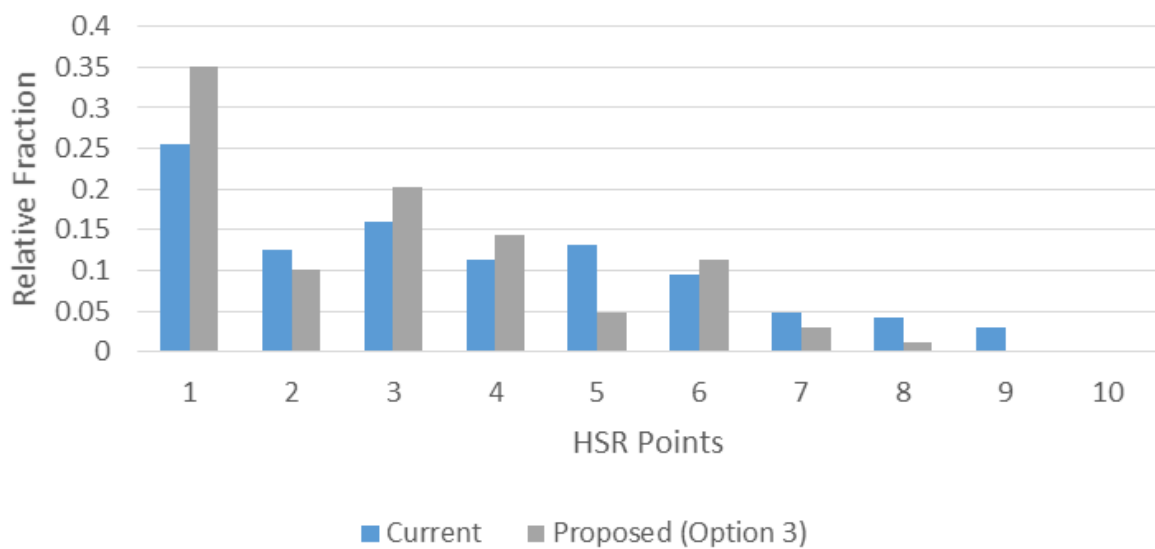
F. DISCRETIONARY FOODS: BISCUITS

Wholegrain Amendment (Option 2):



The average HSR point change is + 0.03; range 0 to 1. There is no change in HSR points in 163 out of 168 products. There is a +1 HSR point for n=5 plain wheat based savoury biscuits.

Wholegrain Amendment + Fibre Discounting (Option 3):

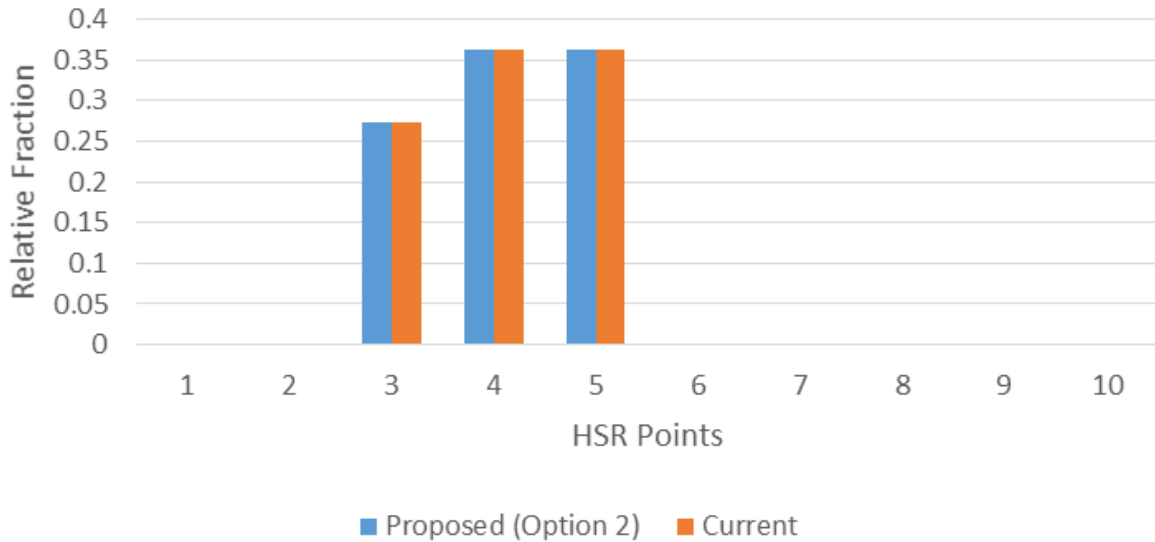


The average HSR point change is - 0.65; range -3 to 0. There is no change in HSR points in 78 out of 168 products.

G. DISCRETIONARY FOODS: BAKERY/CAKE MIXES

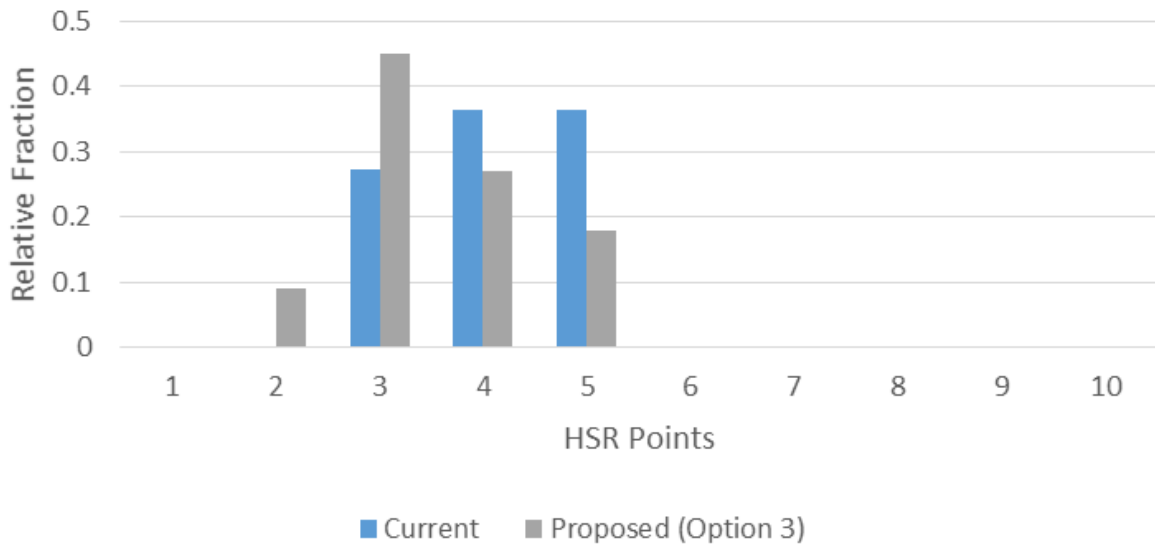
n=10 are plain/unfilled pastry items.

Wholegrain Amendment (Option 2):



The average HSR point change is 0; range 0. There is no change in HSR points in 11 out of 11 products.

Wholegrain Amendment + Fibre Discounting (Option 3):



The average HSR point change is -0.55; range -1 to 0. There is no change in HSR points in 5 out of 11 products.

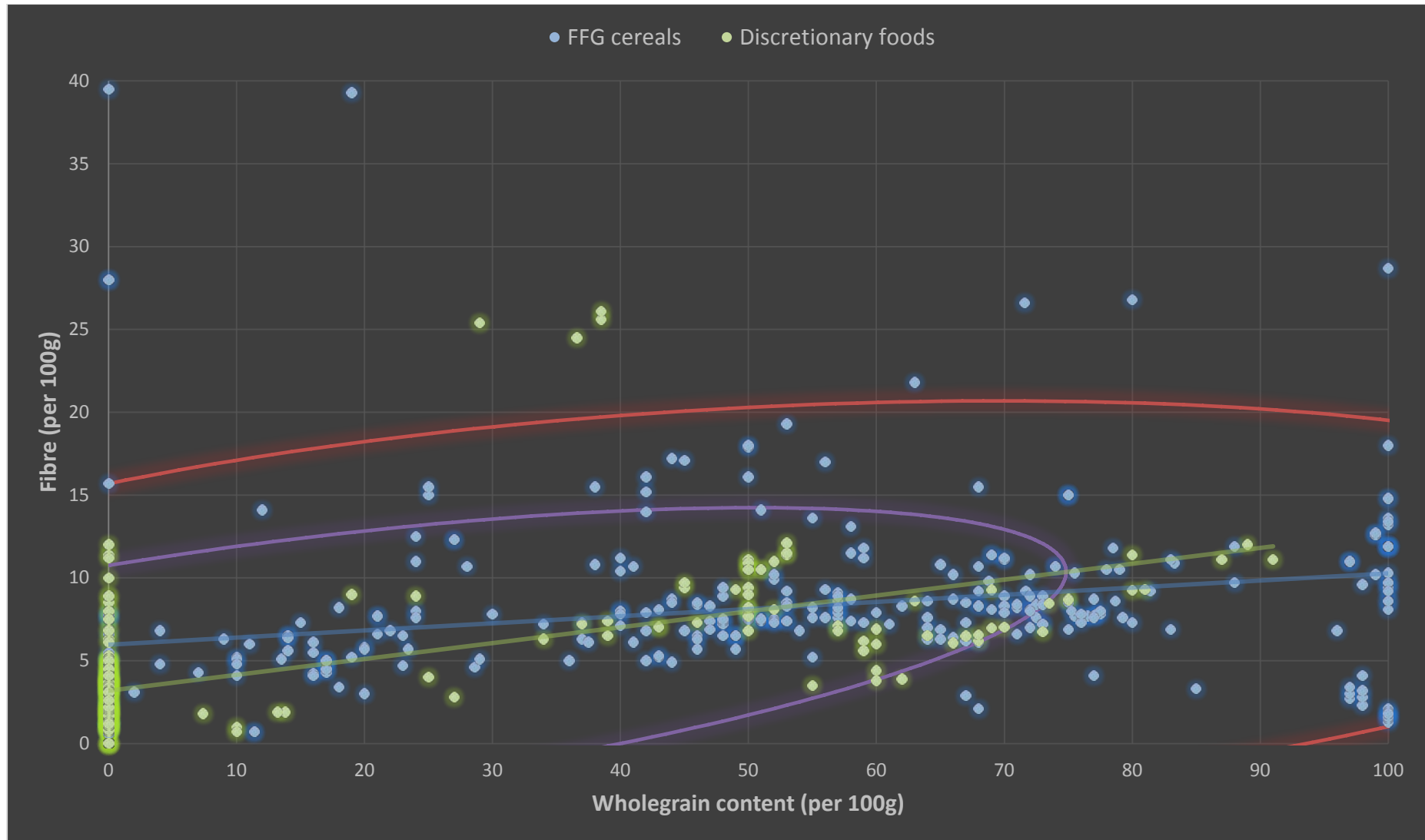


Figure 1: Scatterplot – fibre v wholegrain content (per 100g), with regression lines denoting relationship between wholegrain and fibre content and ellipses showing 95% confidence intervals – this indicates a weak relationship between wholegrain content and fibre content

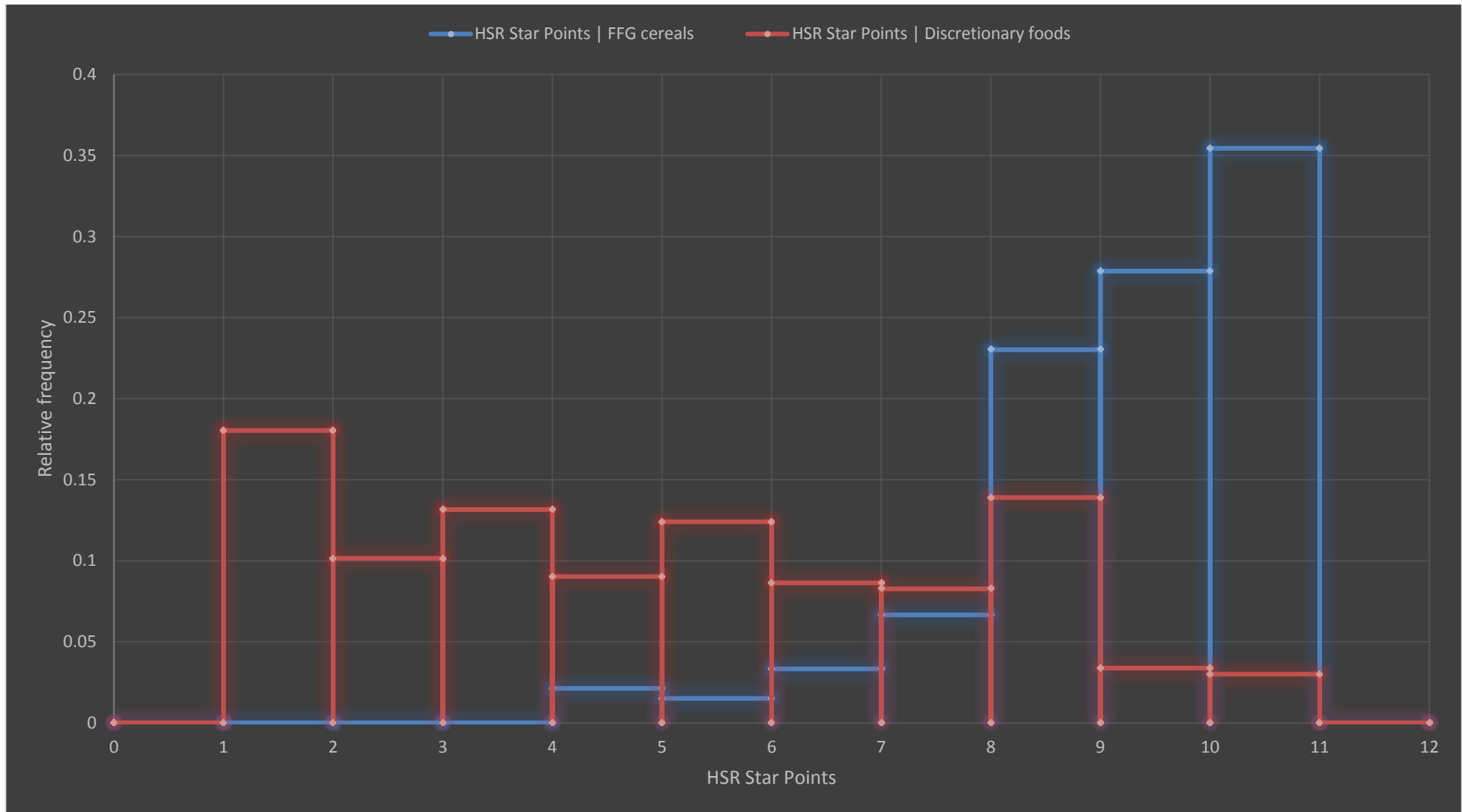


Figure 2: Distribution of FFG Cereal foods and Discretionary foods after applying modification option 2 (accounting for wholegrain).