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

HSR Technical Advisory Group (TAG)

History and development of the HSR algorithm

Contents

Summary

The intention of this paper is to provide an outline of the main processes, decisions and justifications made during the development of the current voluntary front-of-pack labelling (FoPL) scheme employed in Australia and New Zealand, specifically for the Health Star Rating (HSR) algorithm that is part of the HSR system. The paper also covers other FoPL options considered. The overall aim of the paper is to improve transparency on the process undertaken to develop the final HSR algorithm.

Following the 2011 Blewett Review, a FoPL Project Committee was established to progress Recommendation 50 to develop a FoPL scheme in a collaborative process with industry, government and public health professionals. In October 2012 the Technical Design Working Group (TDWG) of the Project Committee approached Food Standards Australian New Zealand (FSANZ) with a request for assistance in its technical work on the development of a FoPL scheme. The focus of this work was to develop an algorithm for a single FoPL symbol that, alongside some elements of interpretive information, would *'provide convenient, relevant and readily understood nutrition information and/or guidance on food packs to assist consumers to make informed food purchases and healthier eating choices'.*

Based on research of several possible models, FSANZ considered a modified Nutrient Profiling Scoring Criterion (NPSC) to be the best basis for a single symbol for consideration by the TDWG for use in a new FoPL scheme. The evidence base for this decision included the extensive research previously undertaken by the UK government for a nutrient modelling system for identifying individual foods eligible to carry media advertising for children, that undertaken by FSANZ when revising *Standard 1.2.7 Nutrition and health claims* and developing the NPSC, as well as that undertaken in developing the 2003 and 2013 Australian Dietary Guidelines (ADG). The proposed nutrient profiling model best met the Legislative and Governance Forum on Food Regulation, now the Australia and New Zealand Ministerial Forum on Food Regulation (the Forum) objectives for a FoPL scheme, was consistent with existing provisions in the Australia New Zealand Food Standards Code (the Code) for nutrition and health claims and other labelling requirements, had a food categorisation system and an underlying algorithm balancing key health risk and health benefit nutrients, the selection of which had been based on the ADG.

The key technical decisions made to modify the NPSC algorithm in such a way as to create a graduated system to describe the 'healthiness' of a food (the HSR) are outlined below with the justification for those decisions. The outcome of the NPSC was a yes/no answer to determine eligibility of a food to carry health claims. The modifications for the HSR algorithm were intended to better describe differences in food composition between foods in a given food group (improve granularity) to assist consumers in making a healthy choice when purchasing food. The HSR has 10 levels ranging from ½ star (least healthy) to 5 stars (most healthy).

The HSR system, including the HSR algorithm, was launched in June 2014 with a dedicated website with consumer information, an on-line calculator (HSR Calculator), and industry and style guides to assist users. The Forum, in endorsing the voluntary FoPL scheme in June 2014, also stipulated there should be a review of its impact; in July 2016 the Forum agreed to a progress report after two years and a five-year review to evaluate its impact. The HSR Advisory Committee (HSRAC) is currently undertaking the five-year review on behalf of the Forum. A Technical Advisory Group (TAG) convened by the HSRAC is tasked with investigating the performance of the HSR algorithm.

Any nutrient profiling system and/or food categorisation system will require the drawing of lines between lists of foods and it is unlikely that all stakeholders will always agree on the foods determined to be either side of those lines. The five-year review presents an opportunity to evaluate whether the key decisions underpinning the development of HSR algorithm for the HSR system and incorporated in the HSR Calculator had the intended impact in practice and are fit for purpose now that the system has been implemented in practice for four years.

The main steps in the decision-making process for the HSR system are summarised in Appendix 1 and covered in more detail in the main report.

Purpose of the paper

The intention of this paper is to provide an outline of the main processes, decisions and justifications made during the development of the current voluntary front-of-pack labelling (FoPL) scheme, the Health Star Rating (HSR) system. The paper focuses specifically on the development of the HSR algorithm but also covers other FoPL options considered. The overall aim of the paper is to improve transparency on the process undertaken to develop the final HSR algorithm.

Background

The background to the development of the HSR system currently employed in Australia and New Zealand is outlined below, setting the parameters within which the current system was developed. A timeline is given in Appendix 1.

Initial consideration for the need of a FoPL system was first raised in 2004 by the Australian and New Zealand Ministerial Forum on Food Regulation (the Forum) and the Forum agreed to develop policy guidance for a FoPL in Australia. In 2009 the Forum endorsed a Policy Statement for FoPL, and agreed to a comprehensive independent review of food labelling law and policy.[1]

In 2009 an expert panel chaired by Dr Neal Blewett, AC, undertook the review. The panel's final report, *Labelling Logic Labelling Logic: Review of Food Labelling Law and Policy* (the Blewett Review), was publicly released on 28 January 2011. In December 2011, the Forum responded to the review[2].

The Forum supported Recommendation 50 of the Blewett Review, namely that an interpretive Front-of-Pack Labelling (FoPL) scheme should be developed, proposing *to 'undertake a collaborative design process with industry, public health and consumer stakeholders, with a view to reaching a broad consensus on a possible approach to interpretive FoPL'*. The Forum in its response also pointed out that the '*food labelling regulatory framework must strike a balance between seeking to ensure good public health outcomes (both short and longer term) and ensuring a strong and profitable food industry*'.

The stated aims and objectives of the proposed collaborative process were given in a Forum policy statement (Appendix 2), the main aims being to:

- move away from the current divisive debate and polarised views by building on the common ground among stakeholders
- focus on addressing issues of concern, exploring new approaches and possibilities for building on existing schemes
- help avoid the proliferation of different FoPL systems and the potential for consumer confusion from conflicting or inconsistent nutrition messages.

[1] Australia and New Zealand Food Regulation Ministerial Council, 2009, Final Communique, 23 October 2009: http://foodregulation.gov.au/internet/fr/publishing.nsf/Content/A86500D7041BEEC1CA257F79000DF7F7/$File/2009-10-23-ANFRMC-Final%20Communique.pdf

[2] Legislative and Governance Forum on Food Regulation, 2011, Communique, 9 December 2011: http://foodregulation.gov.au/internet/fr/publishing.nsf/Content/forum-communique-2011-December

Governance

The Food Regulation Secretariat (located within the Australian Government Department of Health) at the direction of the Forum convened in early 2012 an oversighting FoPL Steering Committee (Steering Committee) and a FoPL Project Committee (Project Committee). The Steering Committee consisted of Australian state and territory government officials drawn from the Food Regulations Standing Committee (FRSC) with the remit of guiding the Project Committee's recommendations through the Forum processes. The Project Committee membership included relevant stakeholders, including government, industry, public health and consumer representatives, to undertake the task of developing a suitable FoPL scheme. Such a scheme was to be developed in accordance with the policy objectives outlined in the Forum *Policy Statement on front of pack labelling* (Appendix 2). That is, to develop a FoPL scheme to guide consumer choice towards healthier food options by enabling a consumer to make comparisons between foods in a supportive environment, ensuring the FoPL scheme was consistent with existing health strategies and guidelines and that it provided incentives to improve the healthiness of the food supply.

These objectives for a FoPL scheme were summarised by the Project Committee:

> *'To provide convenient, relevant and readily understood nutrition information and/or guidance on food packs to assist consumers to make informed food purchases and healthier eating choices'.*

The scope of the FoPL scheme, as determined by the Project Committee, was that it should combine both interpretive and informative elements within two parameters: one system that was widespread, simple and interpretive; with a priority focus on packaged, manufactured or processed foods presented ready for sale to the consumer in the retail sector (Appendix 3).

Design elements were identified by the Project Committee such that the FoPL scheme:

- should synthesize, simplify and translate substantiated nutritional information and present it to inform food choice and support healthy eating
- should be widely understood including by those most at risk from poor nutrition and associated health risks
- may be based on symbols, numbers, words, colours and/or quantifiable attributes of the food products, or combinations of these elements
- should enable appropriate comparisons between foods based on agreed and consistent measures. The system should be aligned with other food regulation, public health policies, and authoritative sources of dietary advice including:
    - Australian Dietary Guidelines (ADG)
    - Ministerial Guidelines and Statements
    - Nutrition, Health and Related claims regulations and industry codes
- should be based on elements that inform choice on balance by assessing both health-benefit and health-risk associated food components
- should comprise both numerical and consumer education elements.

To assist its work the Project Committee convened a Technical Design Working Group (TDWG) and an Implementation Working Group (IWG), both of which were required to prepare a proposed work plan for report back to the Forum by 11 May 2012. The plans for implementation, future monitoring and consumer work of the IWG is not covered in this paper, nor the outcomes of consumer testing of proposed FoPL schemes as these are available elsewhere.

In October 2012 the Project Committee approached Food Standards Australia New Zealand (FSANZ) with a request for FSANZ to work with the TDWG and provide technical advice on the development of the numerical component of a FoPL scheme. A FSANZ draft technical report was prepared for consideration by the TDWG by February 2013. The Chief Public Health Nutritionist and staff from the Food Data Analysis and Labelling Sections of FSANZ provided technical expertise for the project. The Project Committee also requested that the

National Health and Medical Research Council (NHMRC) provide advice on using information on total sugar and/or added sugar content in the FoPL scheme and likely impact on diet quality. The TDWG made recommendations to the Project Committee who made the final decisions on the numerical component of the FoPL scheme, taking the advice from FSANZ and the NHMRC into account[3]. The work of all parties was guided through the decision-making process of the Steering Committee (see Figure 1 for governance structure[4]).

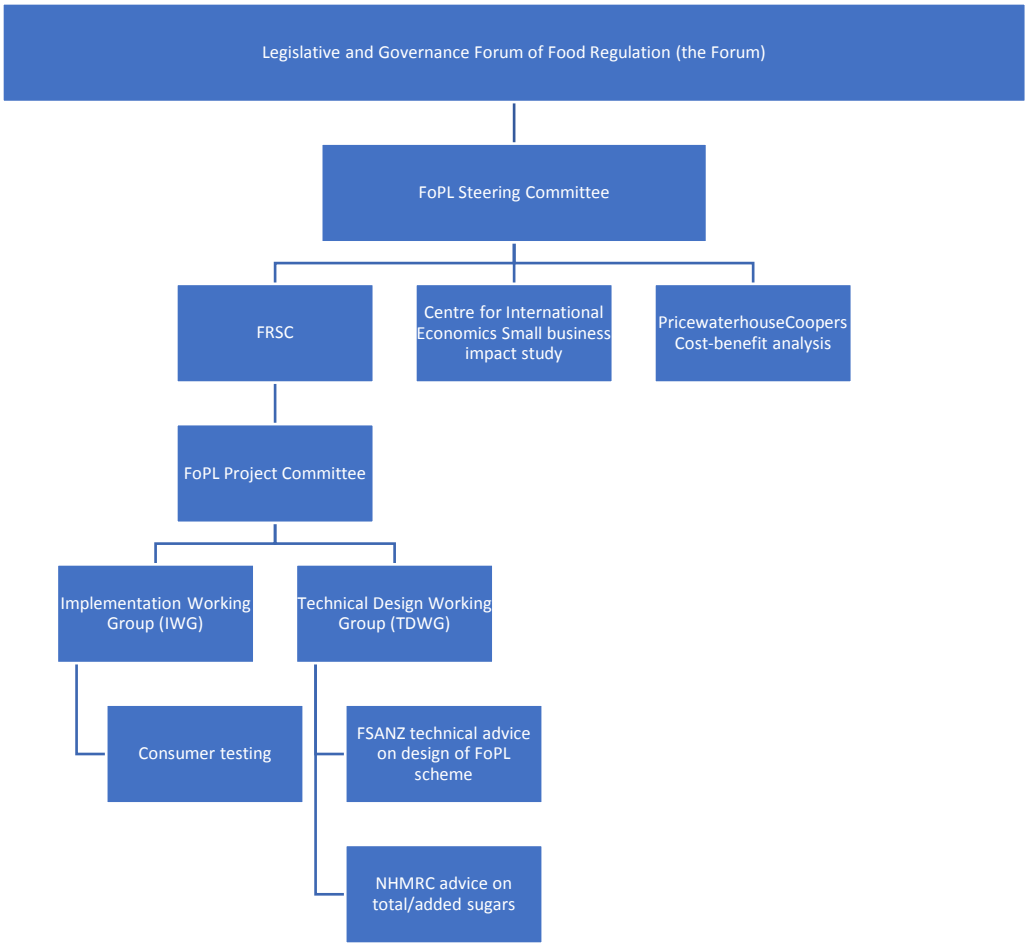

Figure 1: Governance of the development of the FoPL scheme

[3] A FSANZ technical report and the NHMRC advice were provided to the TDWG and the FoPL Project Committee as working documents (unpublished)

[4] Further information on the outcomes of FoPL committee and working group meetings are available on the Food Regulation website, including the cost-benefit analysis and small business impact reports: http://foodregulation.gov.au/internet/fr/publishing.nsf/Content/frontofpackcommittee

Development of the HSR algorithm

The Project Committee reviewed various labelling schemes, including the dietary intake guides (DIG) and the traffic lights scheme employed in the UK. The Project Committee concluded that a scheme with a single symbol combined with consumer education elements would meet the need for a simple interpretive system and the design criteria outlined above, providing it synthesised complex nutritional information in a way that informed food choice and supported healthy eating whilst being widely understood by the intended target groups. The TDWG was tasked with developing the numerical component underpinning the use of a symbol with technical assistance from FSANZ.

The development process for the HSR algorithm was an iterative one and took a number of months with many options considered and evaluated. There was no requirement to formally record the details of the decision making process at the time, however summaries of committee and working group meetings are available on the Food Regulation website.[3] FSANZ worked with the TDWG from October 2012 to June 2013 on the HSR algorithm and provided technical advice to the TDWG and the Australian Government Department of Health on the development of the user guides up until June 2014. Between July 2013 and June 2014 the TDWG and Project Committee finalised the HSR algorithm and guides.

On 27 June 2014, the Forum endorsed the finalised algorithm and supporting material. The release of the voluntary HSR scheme was supported with a dedicated website, consumer information, online calculator (HSR Calculator) and user guides. The Forum also welcomed the announcement of the New Zealand government on 27 June 2014 to join the voluntary HSR system, based on their own research and alignment with Eating and Activity Guidelines for New Zealand Adults[5] (NZEAG) and the New Zealand principles for voluntary FOPL.

Food categorisation system

It was recognised from previous work on the ADG and other labelling schemes, such as the Heart Foundation tick, that a numerical system used to describe a whole food for a FoPL scheme might need to encompass different rules for different food categories.

Initially the TDWG sought to classify foods according to the Australian Guide to Healthy Eating (AGHE) food groups, which supported the 2003 ADG, noting the revised 2013 ADG were not published at this time.[6] However, this approach presented some difficulties due to the number of mixed foods available in the food supply which were difficult to classify consistently against the AGHE, for example, mixed food or meals made with ingredients from more than one of the five food groups (FFG) and not containing any discretionary foods or ingredients, such as casseroles, stir fries, macaroni cheese and other pre-prepared pasta meals, some pizzas and hamburgers.

From October 2012, FSANZ examined alternative approaches to categorising foods, including the Nutrient Profiling Scoring Criterion (NPSC) food categories used to determine eligibility of foods to carry a health claim (Standard 1.2.7) [7] and the food categories used in the food additive standard (Standard 1.3.1), in the Australia New Zealand Food Standard Code (the Code).

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[5] Ministry of Health, 2015, Current Food and Nutrition Guidelines: https://www.health.govt.nz/our-work/eating-and-activity-guidelines/current-food-and-nutrition-guidelines

[6] The work was based on the 2003 version of the ADG and the AGHE as it was undertaken prior to the publication of the revised ADG. Though key messages in the current 2013 ADG are similar to the 2003 version, the revised ADG have been updated with recent scientific evidence about health outcomes. To make the information easier to understand and use, the 2013 ADG are based on foods and food groups, rather than nutrients as in the 2003 edition. Assumptions made in the HSR system development were however considered to be still valid against the 2013 ADG.

[7] FSANZ, 2012, P293 - Review Report: http://www.foodstandards.gov.au/code/proposals/Pages/proposalp293nutritionhealthandrelatedclaims/Default.aspx.

To test out the impact of proposed FoPL schemes, including different food categorisation approaches, the TDWG, worked with the food industry (through its industry representatives) to compile a database of ~1500 packaged foods across various food groups with nutrient content information required for food labelling via the Nutrient Information Panel (NIP). Where necessary, data gaps were filled in by FSANZ using its most up to date national food composition (NUTTAB 2010) and survey (AUSNUT 2011-13)[8] databases. The TDWG database was later expanded to approximately 3,000 foods to better cover all foods categories. The compiled databases were validated by FSANZ by comparing reported nutrient content against expected nutrient content ranges derived from the NUTTAB 2010/AUSNUT 2011-13 databases for each food type and, where necessary, information submitted by food industry members was clarified and updated if necessary.

Table 1 summarises the assessment of the three food categorisation systems undertaken by FSANZ and the TDWG. All three food categorisation systems were considered to have potential advantages and disadvantages when assessed against the design criteria, though the food additive classification system was deemed the least suitable as it was only indirectly linked to health policies and guidelines. The AGHE is directly linked to the messages in the ADG; however, as stated earlier it could not classify complex mixed foods, especially non-discretionary mixed foods, consistently. The NPSC had well defined food categories consistent with the Code and the added advantage of an associated well-researched and substantiated scoring system based on the nutrient content of individual foods, so it was considered the best starting point for a FoPL scheme to be applied to individual foods. A further consideration for a new FoPL scheme was that there should be alignment between the appearance of a health claim on a food and the numerical components of the FoPL scheme; that is foods eligible to carry health claims should not have a low rating.

Table 1: Assessment of food categorisation systems against the design criteria for a FoPL scheme

	AGHE[2]	**Food additive standard**	**NPSC**
Original purpose	Supports the 2003 ADG, describes components of a healthy diet at a food group and subgroup level, and quantifies amounts to be consumed.	Supports the safe use of food additives in processed foods according to technological function, describes processed foods at a food group and subgroup level.	Enables the eligibility of individual foods to carry a health claim, uses 3 broad food categories and a nutrient profiling tool that produces a score for each food that is used to determine a yes/no answer within each category.
Alignment with Australian Dietary Guidelines (ADG)	Supporting document to 2003 ADG.	N/A	Nutrients used in the nutrient profiling tool based on those highlighted in ADG, also consistent with NZEAG.
Alignment with health policies and strategies	Part of wider health education strategies on healthy eating and obesity, focus on what should be eaten for health.	N/A (indirectly food additive permissions and the Code aim to support a safe food supply)	Food labelling is part of wider health education strategies on healthy eating and obesity enabling consumers to make an informed choice about purchase of individual foods.
Alignment with Standard 1.2.7	N/A	N/A	Part of Standard 1.2.7, Schedule 5 in the Code.

[8] AUSNUT 2011-13 was unpublished at this point in time, later published in 2014 and updated in 2016 with a free and added sugars database, available at: www.foodstandards.gov.au/science/monitoringnutrients/Pages/default.aspx

	AGHE[2]	Food additive standard	NPSC
Nutrition and health claims			Definitions for foods and exclusions for use of health claims could be applied to foods in FoPL scheme to ensure consistency in labelling (e.g. for infant formula, kava, alcohol).
Basis of food categorisation system	Based on whole foods, sorted into FFG of ADG. Cannot easily categorise mixed foods (especially those with non-discretionary food ingredients).	Based on processed foods, has a mixed food category with carry over permissions for food additive use for ingredients (linked to international Codex standards).	Based on whole foods divided into 3 main categories (beverages, fats/oils and hard cheese, all other foods). Mixed foods are included in Categories 1, 2.
Balance of health-benefit ('positive') and health-risk increasing ('negative') food components	FFG contribute to necessary intake of micronutrients (positive components). Determination of when foods contain enough negative components to become discretionary rather than FFG foods is not specified.	N/A No algorithm associated with food classification system.	The NPSC's numerical algorithm, is based on 4 negative nutrients, 2 positive associated nutrients and proportion of fruit, vegetables, nuts and legume (FVNL) ingredients.
Synthesis, simplification and translation of substantiated nutritional information	Numerical basis for determining discretionary foods determined from extensive research (ADG background documents) but approach varies with food group. Does not cover non-discretionary mixed foods. No allowance for reformulation of individual products over time.	N/A No algorithm associated with food classification system.	NPSC algorithm based on extensive UK and FSANZ research on nutrient profiling tools and ADG research, uses nutrient content information from analysis of individual foods or food composition tables and recipes (% FVNL). Can be applied to individual foods in each of 3 food categories, including complex mixed foods. Takes reformulation into account.

NPSC as a basis for a FoPL scheme

After evaluation of different approaches using the three food classification systems, FSANZ provided technical advice to the effect that a modified NPSC was likely to be the best basis for the numerical component of a new FoPL scheme and not the dichotomous FFG/discretionary food system from the ADG. A brief outline of the scientific basis for the development of the NPSC is given in Appendix 4; further details are available in documents supporting FSANZ Proposal P293 Nutrition, health and related claims.[7]

Advantages and disadvantages of using a nutrient profiling tool in the numerical component of a FoPL scheme

In the HSR algorithm, a product's HSR is based on *empirical* nutrient and ingredient content and a relevant risk assessment. This *theoretical* risk matrix is derived from both a body of evidence sitting behind the NPSC and the ADG. This includes extensive research previously undertaken by the UK government in developing a nutrient modelling system for identifying individual foods eligible to carry media advertising for children, that undertaken by FSANZ when revising Standard 1.2.7 Nutrition and health claims, and developing the NPSC, as well as that undertaken in developing the 2003 and 2013 ADG.

The main advantage of nutrient profiling systems is that by design they are only based on the nutrient, energy or ingredient content of a food or beverage (as analysed, determined from a reference database or derived from a recipe) rather than a subjective decision. For the NPSC and HSR algorithms, the specific food components chosen are those deemed from research to be relevant to risk or prevention of diet related chronic disease (energy, sodium, saturated fat, total sugars, protein, fibre and fruit, vegetable, nut and legume ingredients). The composition of a specific food or beverage or nutrient profile is inherent to that product as is the score it achieves i.e. within each food category the score and star rating is 'self-selected' in the sense that it is determined only on the basis of this profile. A food can then be related to the content of neighbour foods using their respective HSRs, making consistent comparison possible.

All the risk-increasing nutrients highlighted in the ADG with advice for consumers to reduce their intake are accounted for in both the HSR and NPSC algorithms; directly for sodium and saturated fat; and, indirectly for added sugars by using total sugars. The health benefit nutrients calcium and iron are indirectly accommodated by including the protein content as a proxy for calcium in dairy products and iron in animal products. The inclusion of protein as a health benefit nutrient also serves to modify the influence of the intrinsic sugar (lactose) content of dairy products on the total sugar content and hence final scoring outcome for a dairy food or beverage.

For industry, use of a modified NPSC to determine a food's HSR ensured consistency between the HSR and NPSC systems and minimised extra cost burdens, in line with Forum objectives for a FoPL scheme. This is because the same nutrient content and ingredient information is required for both labelling schemes. As noted above, the HSR system was designed such that foods eligible to carry health claims generally achieved a higher star rating than similar ineligible foods, this achieving consistency in labelling and messaging to consumers.

The main disadvantage of a nutrient profiling system is the complexity of information on nutrient content and recipes (to determine FVNL content, for example) required to run each individual food through an algorithm to determine a HSR, which also requires some technical knowledge of Excel or another statistical platform. The mitigation of these risks in relation to the HSR algorithm is discussed below.

Adapting the NPSC for the FoPL scheme

In adapting the NPSC for use in the proposed Australian FoPL scheme, it was recognised that the NPSC was designed to determine the answer to a simple question for food manufacturers and retailers, that is, is the food eligible to carry a health claim or not? However, to meet the objectives and criteria for a FoPL system that gave information on *relative* 'healthiness' of a food, the point scoring system in the NPSC needed to be modified to provide greater discrimination between foods within the same category. The NPSC point scales for some nutrients and FVNL ingredients were extended at the top end of each scale to achieve this outcome (see Table 2 and Appendix 5).

A graduated star system had proved to be readily understood by consumers in other contexts (white goods, accommodation and restaurant ratings) and FSANZ was asked to

provide advice to the TDWG about how this may be applied to a modified NPSC (2013 FSANZ draft report to the TDWG). Various algorithms were modelled by FSANZ using the database of 1,500 foods (1-step versus a 2-step model[9], 3 versus 5 stars, different ways of allocating modified NPSC points).

A 1-step 10 level system (5 stars in half star increments) was agreed by the TDWG, with some modifications made in mid to late 2012 to the algorithm following feedback from the TDWG, the Project Committee and stakeholders (see next section: *Summary of key decisions*). Despite not accepting a 2-step model, the expectation of the TDWG was that the NPSC and HSR system would be aligned as closely as possible, such that foods that were ineligible to carry health claims would be likely to receive half to two-and-a-half stars or less and foods eligible to carry health claims would likely receive three to five stars.

This approach has the advantage of using the same risk increasing (negative) and health benefit (positive) components and ingredients originally derived from the ADG, thus aligning the proposed HSR with the ADG as far as possible. It also aligns well with Standard 1.2.7 Nutrition, health and related claims, and with industry codes, meeting one of the stated objectives for a FoPL scheme.

The disadvantages of using a nutrient profiling tool for the FoPL scheme were considered to be mitigated to some extent because the set of information required for a modified NPSC algorithm is identical to that required for determination of the eligibility of a food to carry health claims, therefore no additional technical analyses would be required over and above that specified in the Code for the NPSC. In addition, for small businesses with no resources to undertake analysis for nutrient content of the foods they produce for labelling purposes, the Code permits use of recognised sources of referenced information on nutrient content for similar foods, such as the NUTTAB or AUSNUT databases published by FSANZ.

The main points of difference between the HSR algorithm (modified NPSC) and the original NPSC are:

- the changes in points scored for nutrient and FVNL content
- addition of three new food categories for dairy beverages, hard cheeses and other dairy-based foods
- inclusion of some Standard 2.9 Special Purpose Foods (supplementary foods) in the HSR system that are excluded from carrying health claims.

Feedback on an early draft of the HSR system highlighted the fact that basic dairy products received a high modified NPSC score and hence a lower star rating than expected, mainly due to the high fat content of some products, which did not align well with the ADG. Following consideration of the substantive scientific evidence base on the potential health benefits of eating basic dairy foods, including literature reviews and ADG research, three additional categories, which are supported by suitable definitions in the Code, were added to the HSR algorithm. These categories have set criteria to distinguish dairy from other foods and a slightly different way of assigning star points so as to better align with the ADG. Non-dairy analogues were included in the relevant dairy food group, providing they met the set criteria for calcium, in line with provisions in the Code for cow milk substitutes, and the ADG. These re-scaled categories also enabled greater differentiation between dairy products to align with the requirement of the HSR system to provide information to assist consumer choice.

Once the HSR system was implemented, a HSR calculator was provided on the HSR website to assist small businesses, enforcement agencies and public health professionals with running foods though the HSR algorithm, thus alleviating the need for a high level of technical expertise.

[9] 1-step model was one decision on a star rating based on the modified NPSC points; 2-step model first determined if a food was eligible to carry a health claim, then calculated the modified NPSC points before assigning a star rating but this resulted in bi-modal distribution of stars across food categories that was not seen as desirable.

Summary of key decisions

Key decisions taken in the development of the final HSR algorithm are presented below in Table 2, based on existing documentation, presentations and papers prepared for the TDWG and discussion with FSANZ, Australian Government Department of Health staff and TDWG members involved in the process (not necessarily in chronological order). This does not necessarily capture all the work undertaken on alternative approaches as some, such as using the AGHE as a basis for the numerical component of the FoPL scheme, were extensively researched and later discarded.

The current algorithm may also differ from the model first proposed in the 2013 FSANZ technical report to the TDWG, since this was the starting point for the development of the algorithm only. As stated earlier, it was an iterative process, taking account of opinions expressed by TDWG members at various stages of the system's development and a wider group of stakeholders who had an opportunity to give feedback on the proposed final HSR algorithm.

The major decision for a new FoPL scheme was to use a nutrient profiling approach and base the HSR algorithm on the NPSC described in Standard 1.2.7 Nutrition and health claims of the Code and its associated food categories. The HSR system also retained relevant labelling conditions and food definitions prescribed in the Code, thus achieving consistency for food manufacturers and messaging for consumers, in line with the FoPL objectives.

In summary, the HSR algorithm requires foods to be assigned to one of the six food categories (three from the NPSC approach and three additional dairy categories). The content of energy, saturated fat, sodium, total sugar, FVNL, protein and fibre in 100 g of the product once entered into the calculator generate a HSR score, which is then converted into a HSR (a rating ranging from 0.5-5 stars – in half star increments).

Since its release in June, 2014, no further changes have been made to the underpinning HSR algorithm, but changes have been made to the overall system in addressing accepted anomaly submissions.[10]

The TDWG also considered the NHMRC report on sugars provided to the FoPL Project Committee and decided to recommend total sugars be part of the informational content of the HSR and hence use total sugar in the HSR algorithm for the following three reasons:

- agreement between the ADG recommendation about sugar consumption and the legal requirements of the NIP could only be achieved by use of total sugars
- claims regarding added sugar cannot be verified, either by industry or jurisdictions, meaning fraudulent claims cannot be challenged
- the seasonality of natural sugars content of some ingredients requires variable compensation using added sugar in some foods, such that the added quantity cannot be consistently stated.

A policy decision to assign an automatic 5 stars to water (as defined in the Code) was taken by the Project Committee and endorsed by the Forum, noting that water would otherwise have a lower 2 star rating, which was not in line with dietary advice to drink plenty of water.

[10] FoPL Secretariat, 2017, Anomalies: http://www.healthstarrating.gov.au/internet/healthstarrating/publishing.nsf/Content/Applying-to-your-products#anomalies

Table 2: Key steps taken in the development of the HSR algorithm

Decision	Justification	Date
The NPSC point scoring components were suitable for the HSR algorithm: • saturated fats, sugars, sodium, energy content (baseline points, associated health risks) • protein, fibre content, % FVNL (modifying points, associated health benefits noting that protein was a surrogate for several micronutrients).	As for NPSC, nutrient content information already required for NIP labelling, reducing requirements for additional analytical data.	By end 2012
No additional components considered for HSR	Although ADG advice is to consume foods high in iron, calcium and/or omega-3 fats, use of protein as a surrogate for these derives from modelling done by Rayner et al. when developing the UK model (i.e. protein is a good proxy for iron content in meat products; for calcium in dairy products and omega-3 content and, for dairy products, offsets the lactose content of milk) (Rayner et al 2009[5]). Fibre might also be considered a proxy for the wholegrain content of a food, there being no analytical method for determining wholegrain content, the proportion of wholegrain may only be determined from recipe information if known. *Note*: TDWG noted that manufacturers already have an option to make a wholegrain content claim to provide this information to consumers.	By end 2012
Total sugars retained as a component in HSR not added sugars. The TDWG considered the NHMRC technical report on sugars provided to the FoPL Project Committee and decided to recommend total sugars be part of the informational content of the HSR system, rather than include in the HSR algorithm.	ADG advice is to reduce intake of added sugars, however added sugars not required on the NIP and there is no easily accessible analytical method for determining added sugar content for industry to use. The NPSC and HSR aim to implement this ADG in a two-step process using both total sugar content and % FVNL (to offset sugar in fruit) or protein (to offset lactose in milk). *Note*: the proportion of added sugar may only be determined from the product recipe, if known.	By end 2012
Basic NPSC algorithm to be modified to extend point scales for some components to meet different purpose of HSR, by	Extra granularity between foods in same food group required to describe by a star rating with 10 levels (½-5 stars) compared to a	By end 2012

Decision	Justification	Date
'uncapping' point scales for nutrients.	yes/no answer required for NPSC outcome. NPSC point scales, for Standard 1.2.7, had not needed to be extended further because they achieved the desired outcome of classifying foods for the purpose of answering a yes/no question.	
Uncapping achieved by extending NPSC linear point scales beyond the top end, thus retaining the existing NPSC point scales at the bottom end: • linear extension for sugar • non-linear extension of NPSC point scales for sodium, fibre, saturated fats and protein (Categories 1, 2) • gaps filled in NPSC point scales for %FVNL and % concentrated FVNL, with same rules and definitions applying as for NPSC. *Note* • linear NPSC point scales for energy, sugars, saturated fats remained unchanged for Category 3 foods (Further details in Appendix 5)	For Category 3 foods the existing NPSC point scales captured composition of foods in this category, so no need to uncap point scales further. Scale extended linearly for sugar as some foods could be 100% sugar (although most foods are <50%); there are a range of foods between 50-100% sugar (e.g. dried fruit, jam, fruit pastes, fruit-based sauces, meringues, confectionery, some biscuits, muesli bars). Non-linear extensions for some health risk components for Categories 1 & 2, based on food composition information and the fact that foods in these categories could not contain 100% sodium, and unlike Category 3 foods were unlikely to contain 100% saturated fatty acids. For protein and fibre the distributions were tapered off by using non-linear extensions as it was not considered necessary to assign a large number of points to higher content, over and above that at the lower end already covered by the NPSC scales. Gaps were filled in the % FVNL % concentrated FVNL scales to increase granularity of scores between similar foods in a category where recipes varied (e.g. muesli bars, breakfast cereals).	By Jun 2013
The balance between maximum baseline and maximum modifying points in the HSR is 2:1, remaining the same as in the NPSC.	Same ratio of maximum baseline and maximum modifying points (2:1) to be maintained in the NPSC and HSR for consistency, ensuring that in both systems negative components had more influence on the final score than positive components. (Note: NPSC ratio is 10:5 points; HSR ratio is 30:15 points)	By Jun 2013
Three extra food categories created for dairy products and non-dairy analogues, with criteria for classification as a dairy beverage, cheese and other dairy foods developed, based on calcium content: *Category 1D* (calcium content ≥ 80 mg/reference serve	Feedback highlighted the fact that basic dairy products received a high modified NPSC score and hence a lower HSR than expected, mainly due to the high fat content of some products, which did not align well with the ADG. A literature review and ADG research supported the Dairy Industry's	By Jun 2013

Decision	Justification	Date
of 200 mL) *Category 2D* all cheeses with a calcium content ≤320 mg/100 g and other FFG dairy based products (e.g. yoghurt, quark) with <25% other ingredients *Category 3D* cheese and processed cheese as defined in Standard 2.5.4 with a calcium content of >320 mg/100 g). Star assignment adjusted such that a dairy food with the same score as a non-dairy food was assigned a higher star rating (see Table 3).	submission to the TDWG on the potential health benefits of eating basic dairy foods. To make allowances for the special case for basic dairy foods, and to better align with the ADG, three additional categories were added to the system, with set criteria to distinguish them from other foods and to better differentiate foods within each dairy category (e.g. low fat content products from high fat products). Criteria: *Category 1D* criteria derived from calcium content required for a source of calcium claim on a beverage *Category 3D* in line with NPSC definitions *Category 2D* covered the remaining cheeses and basic dairy products. *Note:* Some dairy based desserts (e.g. sweetened custards), fruit cheese with >25% other ingredients and dairy based dips were not included in the dairy categories, as the ADG/AGHE indicated they would be considered to be discretionary foods.	
Exclusions for HSR based on general principle for FoPL developed by the TDWG and later endorsed as part of the HSR system by the Forum[11]. Excluded foods aligned with Standard 1.2.7, Schedule 5 conditions and definitions already prescribed in the Code for health claims (i.e. excluded vitamins and minerals, complementary medicines, breast milk, kava, alcohol including kits, Special Purpose Foods in Part 2.9 of the Code with specific compositional requirements for target groups {e.g. infant formula, toddler milks}) *except:*	Different exclusions in the HSR system for Standard 2.9.3 Formulated meal replacements and formulated supplementary foods compared to Standard 1.2.7 were made because they met the general principle agreed at the time that FoPL applied, as composition could be varied within regulatory constraints; these foods were considered to be no longer restricted to consumption by target groups and were part of everyday diets.	By Jun 2013

[11] General principle: *If the composition of a food can be varied, within regulatory constraints, to yield different foods, and a profiling mechanism exists within the FoPL system to detect compositional variation in those foods and rank them nutritionally, they will be comparable and therefore should be included within the scope of the FoPL system.*
Foods not captured by the general principle are excluded by precedents in the Code (e.g. Standard 1.2.7) or FoPL policy

Decision	Justification	Date
• unlike Standard 1.2.7, foods covered by Standard 2.9.3 Formulated meal replacements and formulated supplementary foods could be assigned a star rating. • Excluded foods intended for further processing or packing, for delivery to vulnerable populations (home meals or hospital) consistent with Standard 1.2.7.		
Excluded foods where a NIP is not required[12] (e.g. fruit and vegetables, sandwiches made up each day as composition may vary unless made to a specific recipe, in which case a NIP is required) Excluded non-nutritive ingredients where a NIP not required (e.g. vinegar, herbs, spices) and single non-nutritive foods except for plain water (e.g. tea, coffee, mineral water, ice, salt)	Consistent with Code. For non-nutritive ingredients where a NIP is not required, a HSR was not considered useful information for consumers, as a zero HSR is achieved for most of these foods. Policy decision taken by FoPL Project Committee and endorsed by the Forum to assign 5 stars to water (as defined in the Code), noting it otherwise would have a lower 2 star rating, which was not in line with dietary advice to drink plenty of water. *Note*: In final version of the HSR system, agreed by the FoPL Project Committee, foods with a zero nutrient content may not carry the full HSR system but rather an energy icon (e.g. diet drinks).	By Jun 2013
Include confectionery and soft drinks	General principle that FoPL applied as composition could be varied within regulatory constraints. No useful Code definitions to distinguish these foods from other foods determined suitable to carry FoPL and likely to be presented in the same shelf space in stores (e.g. confectionery, muesli bars, sweet biscuits, breakfast cereals can have similar nutritional profiles). Met the objectives of FoPL scheme to inform consumers about the nutrient profile of food. *Note*: for some confectionery items the HSR may not be displayed on the pack but only the energy icon due to small package size, a labelling option outlined in the Style Guide.	By Jun 2013
The HSR should be based on the form of food for which the NIP information has been displayed (as sold if it can be	Alignment with labelling requirements, Standard 1.2.8; conditions already prescribed in the Code.	By Jun 2013

[12] See Food Standards Code Standard 1.2.1-6 and Standard 1.2.8-5, available at http://www.foodstandards.gov.au/code/Pages/default.aspx

Decision	Justification	Date
consumed as sold or prepared). If the HSR is based on food 'as consumed', the label should clearly specify elsewhere on the pack the directions for preparation or cooking. (Further details in Industry guide to the HSR system).	HSR not to be used with food made up with milk (Industry guide specifically mentions HSR to apply to breakfast cereals as sold, consistent with requirements in the Code for NIP). Intention was that for drink powders this would also apply but no specific mention was made in the Industry guide to this effect.	
HSR protein point scale further modified such that high protein foods do not score as many offset points compared with earlier versions of algorithm (cut offs higher at the top end of the scale after 5 points).	Removed many high protein/high sodium anomalies.	By June 2014
Changes made to allocation of stars from calculated HSR profiler scores by use of a 'clip and scale' algorithm based on range of scores observed in database of 3000 foods. The distribution of scores at lower and upper centiles was censored (5% at the more nutritious end and 99% cut offs at the less nutritious end for dairy foods, 1% and 99% cut offs for non-dairy foods). The range of scores between each set of end points was then divided into 10 equal intervals to determine the HSR score cut-offs for the star ratings from ½ - 5 stars.	Foods with a nutrient content at the extreme end of the range expected may result in a very high or low score. The clip and scale approach was intended to result in a more normal distribution of ratings not influenced by these outliers (outlier foods are then assigned ½ or 5 stars). The intention of dividing the remaining score range into 10 equal intervals using somewhat flexible profiler score end-points was to reduce the skewness of distribution of scores, ensure a more even distribution of star ratings achieved by foods, centre the distribution of stars within categories about the desired NPSC cut point ratings and the AGHE FFG/discretionary "zone" and hence increase differentiation within different food groups. Strict compliance of a scaling continuum with binary FFG/discretionary definitions is not possible as the HSR relies on a consistent set of components, the values of which are inherent in the food, so in effect foods self-select a star rating on the basis of their nutrient and ingredient content, whereas the FFG/discretionary model (as implemented in the AHS classification) is usually based on single nutrient threshold levels for a given food group, decided by expert review. The scaling process was undertaken so as to respect both health claim cut points as well as the ADG, to the extent possible. Final scaling end-points were determined by an iterative process to achieve the best match with a food's eligibility to carry a health claims and the AGHE FFG/discretionary food boundaries, the results examined and	By June 2014

Decision	Justification	Date
	percentiles agreed by the TDWG, and finally built into the HSR calculator. The HSR Calculator profile score for the food is assigned a numeric value from a 10-point range defined by the clipping points, being calibrated from 0.5 to 10.5 divided into equal intervals (to avoid half intervals at either end of the scale). Most foods therefore lie within the 10-point range, the remainder (6% dairy, 2% non-dairy) being assigned as outliers a ½ or 5 star, depending on which end of range they were in.	
ADG FFG food group added to online HSR Calculator as a required field before the user can proceed to use the Excel spreadsheet (not part of the web-based form for the HSR Calculator)	The reason for adding this was to provide additional information to the user following stakeholder feedback to the FoPL Project Committee on potential difficulties with understanding how the HSR system fitted in with the ADG. *Note:* The ADG food group is not used in the HSR algorithm and is not mentioned in the industry guide to use of the calculator.	By June 2014

The HSR system

Name for the FoPL system

A name for the voluntary FoPL scheme was required to avoid confusion with the nature of Standard 1.2.7 and mandatory use of the NPSC to determine eligibility of individual foods to carry heath claims should manufacturers choose to do so. After much discussion between FSANZ and the TDWG, the FoPL scheme was termed the 'Health Star Rating (HSR) system', which was later endorsed by the Project Committee and the Forum, with the HSR algorithm being part of the HSR system. The use of the term 'HSR system' was supported by qualitative research undertaken from December 2012- January 2013 to test the options of using the current information available on food packs with no FoPL, the existing daily intake guide (thumbnail icons) and the proposed star rating system.[13]

Final HSR system

The HSR system consists of the following components:

- HSR graphic: includes the HSR logo and additional nutrient icons
- HSR Calculator which is underpinned by the HSR Algorithm
- Supporting documentation, which outline the rules of the system (including the *Health Star Rating Style Guide* and the *Guide for Industry to the Health Star Rating Calculator*), and
- Education and marketing activities associated with HSR implementation.

The HSR system finally proposed by the Project Committee was designed to assist consumers to discriminate between foods in each of the six food categories (HSR categories 1,1D 2, 2D, 3 and 3D) but not necessarily between categories or between dairy and non-dairy foods and beverages), by use of a star symbol, with a possibility of 10 different star ratings able to be displayed for foods ranging from ½ star (least healthy) to 5 stars (most healthy). The HSR system graphic also had additional interpretive information on the amount of the four risk increasing nutrients and one selected health benefit component per 100 g (Figure 2).

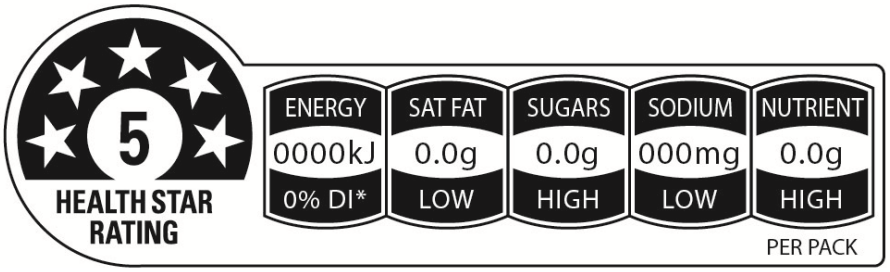


Figure 2: An example of the HSR graphic.

[13] Hall & Partnership/Open Mind, 2013, Proposed front-of-pack food labelling designs: qualitative research outcomes: http://www.healthstarrating.gov.au/internet/healthstarrating/publishing.nsf/Content/formative-research

For the HSR system, component and ingredient information is used in a different way to the NPSC. Hence, the HSR score used to assign a star rating may not have the same numerical value as the NPSC score. The relationship between profiler scores and HSRs for each category is based on both the HSR profiler and the clip and scale process described above in Table 2. The HSR is therefore obtained by a two-stage process, within the one step model:

1. profiling the food to obtain a profiler score, then
2. scaling the profiler score for any particular food relative to the category range of scores converted to 10 equal intervals (Star Points).

The HSR score is assigned a rating according to Table 3, depending on which of the six categories of food in the HSR Calculator it is classified in.[14]

Table 3: Final scores used to assign ratings in the Health Star Rating Calculator

Health Star Rating	**Food Category 1 Non-dairy beverage**	**Food Category 1D Dairy beverage**	**Food Category 2* Non-dairy foods**	**Food Category 2D# Dairy foods**	**Food Category 3 Oils and spreads**	**Food Category 3D Cheese >320 mg Ca/100g**
5	≤ -6	≤ -2	≤ -11	≤ -2	≤ 13	≤ 22
4½	-5	-1	-10 to -7	-1	14 to 16	23 to 24
4	-4	0	-6 to -2	0	17 to 20	25 to 26
3½	-3	1	-1 to 2	1	21 to 23	27 to 28
3	-2	2	3 to 6	2	24 to 27	29 to 30
2½	-1	3	7 to 11	3	28 to 30	31 to 32
2	0	4	12 to 15	4	31 to 34	33 to 34
1½	1	5	16 to 20	5	35 to 37	35 to 36
1	2	6	21 to 24	6	38 to 41	37 to 38
½	≥3	≥7	≥25	≥7	≥42	≥39

**All foods other than dairy not in Category 1 or 3*

 # All dairy foods not in Category 1D or 3D

The use of a modified NPSC to determine a star rating for a food was intended to provide an integrated process for industry users, one which used the same nutrient content and ingredient information as required in the NPSC to determine eligibility for carrying a health claim. This was to ensure consistency between the two labelling options and minimise extra cost burdens for the food industry, in line with the Forum objectives for a FoPL scheme. As noted above, the HSR system was designed such that foods eligible to carry health claims generally achieved a higher star rating than similar ineligible foods, this achieving consistency in labelling and messaging to consumers.

[14] The cut-off points of HSR scores for assigning star ratings were derived from the range of HSR scores generated for over 3000 foods, including packaged, unpackaged foods in the various food categories found in the food supply and single ingredient foods such as sugar and oil. For non-dairy foods, the 1st and 99th quantile scores were taken as the cut-offs for the 'most healthy' end point (5 stars) and 'least healthy' end point (½ star) respectively. For dairy foods the 5th quantile score was taken to determine the cut-off the most healthy (5 stars) and 99th quantile score for the 'least healthy' endpoint. Use of quantile scores to set the lower and upper HSR scores has the effect of removing outlier values, assigning them ½ or 5 stars as the case may be. The range of scores between each set of end points was then divided into 10 equal intervals to determine the HSR score cut-offs for the star ratings from ½ - 5 stars.

To assist industry and other stakeholders to assign a star rating to individual foods a HSR calculator was developed by the FoPL secretariat within the Australian Government Department of Health, using the agreed algorithm, and made available online on the dedicated HSR website as an Excel spread sheet or web-based form[15].

The HSR system and the Australian Dietary Guidelines

The HSR system is designed to assist consumers at the point of purchase to make healthier food choices by providing a single symbol (star rating) that indicates to the lay person the overall 'healthiness' of a food relative to similar foods. The HSR system is not intended to and does **not** replace the ADG, but is intended to be used by consumers along with other additional labelling information such as the NIP on the back of the pack to assist them to follow the ADG.

The ADG gives guidance on how to plan for and consume recommended amounts of a variety of foods such that a meal or daily diet contains food from each of the five food groups with an allowance for a small amount of discretionary foods. The five food groups may all be found in one mixed food or in several foods. By contrast the HSR system has no recommendation on amounts of food to be consumed and applies to individual foods not groups of foods. Additional labelling information such as the NIP and/or nutrient content claims on a food package may assist consumers with particular health conditions to purchase foods suitable for their needs that are high or low in specific nutrients; for example, foods low in sodium may be sought by people with hypertension.

The nutrient profiling system used in the HSR system is consistent with the 2013 ADG in that foods low in saturated fat, total or added sugars, sodium and/or energy are assigned higher star ratings than similar foods with an appreciably higher content of these nutrients; similar foods with a high fibre content are assigned a higher star rating than similar foods with an appreciably lower fibre content, which was confirmed by testing against the TDWG database. Foods in the ADG FFGs generally rate higher than similar foods flagged as discretionary in the AGHE (e.g. steamed potatoes versus hot potato chips). However, in some cases the foods termed as 'discretionary' may have been reformulated to better meet the ADG and therefore be assigned a higher star rating than expected by some (e.g. some brands of hot potato chips cooked with unsaturated oils rather than saturated fats). However, because the AGHE uses a dichotomous system to differentiate FFG and discretionary foods, and the threshold nutrient varies with each FFG, a list of discretionary foods such as those flagged by the Australian Bureau of Statistics for the specific purpose of analysing the 2011-13 Australian Health Survey against the ADG[16], will not necessarily match up exactly with results from the use of an empirically based nutrient profiling system, such as the HSR or NPSC. This is because these latter systems create a score to represent the whole food that balances the content of risk increasing and health benefit components, this score is then used to determine a star rating (HSR) or eligibility of a food to carry health claims (NPSC).

Further details on the alignment of the HSR system with the ADG can be found in the TAG paper on this topic.

The HSR system was **not** designed to give information on the quantity of each food to be consumed in a healthy diet; for this the ADG or NZEAG should be referenced.

[15] FoPL Secretariat, 2014, Calculator and Artwork: http://healthstarrating.gov.au/internet/healthstarrating/publishing.nsf/Content/calculator

[16] ABS, 2016, Australian Health Survey: consumption of foods groups from the Australian Dietary Guidelines: http://www.ausstats.abs.gov.au/Ausstats/subscriber.nsf/0/12E8766EBAB492B0CA257FAF001A3CFD/$File/43640do002_20112012.pdf

Implementation and review of the HSR system

The HSR system is the entirety of the specific algorithm component, a health star rating using a star symbol, graphics with specific nutrient information, user guides and an education campaign.

On 27 June 2014, the HSR Calculator and various consumer materials were published on a dedicated HSR system website with two guides for industry and other professionals:[17]

- an industry guide to the HSR system and calculator defines food categories, exclusions and calculation steps; includes decision flow charts for dairy and non-dairy foods and sample step-by-step calculations
- a style guide for the whole FoPL scheme for the correct presentation of the star rating on food labels with the prescribed consumer education elements (icons presented alongside the star rating to highlight the content of negative components with the option for manufacturers of also highlighting the content of one positive component, presented per 100 g with some exemptions, as detailed in the hierarchy of elements to be presented described in the guide).

The Forum agreed in June 2014 that the HSR system should be implemented voluntarily with a commencement date of 27 June 2014 and stipulated that there should be a review of its impact. The decision took account of the research presented to Ministers on a cost - benefit analysis and study of the impact on small businesses[18] and the significant goodwill and genuine collaboration amongst many stakeholders. A FoPL Advisory Committee, later renamed as the HSR Advisory Committee (HSRAC), was established to work to the Forum via the Food Regulation Standing Committee (FRSC). In July 2016 the Forum agreed that a progress report after two years and a five year review to evaluate its impact should be prepared (Appendix 1). The use of a HSR system was supported by a 2015 progress report on consumer testing.[19] The implementation time-frame was extended to enable cost effective implementation and the potential for food reformulation and consultation with small and medium sized enterprises.

The National Heart Foundation of Australia was commissioned to monitor and provide progress reports, using monitoring data on uptake of the HSR system by industry.[20] In New Zealand the Ministry for Primary Industries is responsible for coordinating the collection and analysis of monitoring data to inform HSR reviews.

The HSRAC has commissioned Matthews Pegg Consulting (mpconsulting) to undertake the independent, five year review on behalf of the Forum. The review will determine how well the HSR is performing, and may involve evaluation on whether the decisions underpinning the development of HSR algorithm for the HSR system and incorporated in the HSR Calculator had the intended impact and are fit for purpose. The HSRAC has convened a TAG to assist with provision of data analysis and modelling to support the reviewer undertake this task.

[17] FoPL Secretariat, 2017, Applying to products:
http://healthstarrating.gov.au/internet/healthstarrating/publishing.nsf/Content/Applying-to-your-products
[18] PricewaterhouseCoopers, 2014, Health Star Rating System – Cost Benefit Analysis; The Centre for International Economics, 2014, Final report: Impact analysis of the Health Star Rating system for small businesses. Both available at http://foodregulation.gov.au/internet/fr/publishing.nsf/Content/front-of-pack-labelling-1
[19] Pollinate, 2015, The Health Star Rating system: consumer use and understanding:
http://www.healthstarrating.gov.au/internet/healthstarrating/publishing.nsf/Content/monitoring
[20] National Heart Foundation of Australia - Progress Reports on Monitoring the Implementation of the Health Star Rating System available at:
http://www.healthstarrating.gov.au/internet/healthstarrating/publishing.nsf/Content/monitoring

Technical areas for review

The short time period for the development of the final HSR algorithm, and the limited data set provided by industry, was insufficient to allow for a full analysis of potential impacts of the decisions made on a wider range of individual foods and beverages prior to the launch of the FoPL scheme, particularly to fully assess the potential impact of clipping the HSR scores prior to assigning a HSR. Since release in June 2014, possible anomalies have been submitted to the HSRAC and resolved as appropriate, with technical information obtained from FSANZ on the algorithm and general labelling requirements as required. Those potential anomalies identified more recently from stakeholder consultation undertaken in 2016-17 as part of the five year review process are currently under consideration by the TAG, as directed by the HSRAC, as part of its role in investigating the performance of the algorithm. The TAG will also consider other issues raised by stakeholders, such as alignment with dietary guidelines, criteria for food categories, potential use of information on added sugars and wholegrains content in the algorithm.

In the five year review it will be important to evaluate whether the decisions underpinning the development of HSR algorithm for the HSR system and incorporated in the HSR Calculator had the intended impact in practice and are fit for purpose.

APPENDIX 1: Summary of key decisions in the HSR system development

Initial work on a FoPL scheme commenced in 2004 with the development of a Ministerial Policy Statement on FoPL, which was endorsed in 2009.

Pre-implementation 2011-June 2014

Jan 2011
- Blewett Review: *Labelling logic*
- Reccomendation 50 for FoPL system for food labels

Dec 2011
- Government response to the Blewett Review

Jan 2012
- FoPL Steering and Project Committees established
- Technical Design Working Group (TDWG) and Implementation Working Group (IWG) convened to assist
- Representation from industry , public health professionals, consumers and government

Oct 2012
- FSANZ requested to assist the TDWG to develop numerical component of a voluntary FoPL scheme
- work to be completed by October 2013

Mar 2013
- FSANZ technical report presented to the TDWG with model options
- Several possible models using a modified NPSC model with 1 or 2 step models with 3 or 5 stars
- TDWG suported a 1 step model with 10 levels (1/2 star 'least healthy' to 5 star 'most healthy' range)

Nov 2013
- FSANZ with TDWG prepare draft HSR algorithm with user guides
- Draft HSR algorithm then tested by industry and other stakeholders

Dec 2013
- Final version HSR algorothm considered by FoPL Project Committee
- Forwarded to Forum

Jun 2014
- Forum endorses HSR system, to be implemented from 27 June 2014
- Forum stipulates a review to be undertaken in future to assess impact
- New Zealand government decision to join the HSR system

Post-implementation June 2014 to present (and future)

APPENDIX 2: Front of pack labelling policy statement

AUSTRALIA AND NEW ZEALAND FOOD REGULATION MINISTERIAL COUNCIL

(Endorsed by Ministerial Council on 23 October 2009)

Front of Pack Labelling Policy Statement

Australia and New Zealand's health strategies stress the importance of a preventive population-based approach to promoting health and reducing the prevalence of diet related chronic disease.

In addition to individual behavioural approaches, the strategies recommend changing the environment to make healthier choices easier choices for people and addressing the needs of diverse population groups.

FOPL provides nutrition information to consumers on the front of packaged foods. FOPL is not a stand-alone strategy but can fit within the context of broader health strategies.

There are indications that FOPL can contribute to consumer understanding of the nutritional content of foods and make it easier for consumers to make healthy choices. FOPL can additionally be used as a marketing incentive to drive the market towards the development of healthier products.

A FOPL scheme is a scheme that can guide consumer choice towards healthier food options and aims to:

Guide consumer choice by:

1. Enabling direct comparison between individual foods that, within the overall diet, may contribute to the risk factors of various diet related chronic diseases.
2. Being readily understandable and meaningful across socio-economic groups, culturally and linguistically diverse groups and low literacy/low numeracy groups.
3. Increasing awareness of foods that, within the overall diet, may contribute positively or negatively to the risk factors of diet related chronic diseases.

Be consistent with other health strategies and guidelines by:

4. Supporting and being consistent with the objectives of programs and strategies designed to reduce the risk of diet related chronic diseases.
5. Guiding consumers to the selection of foods consistent with the Australia and New Zealand dietary guidelines
6. Supporting and being consistent with the Australia and New Zealand dietary guidelines and Nutrient Reference Values

Affect the environment in which consumers make choices by:

7. Contributing to the creation of a supportive environment that can guide consumer choice towards healthier foods within the overall diet.
8. Providing incentive for improvements to the healthiness of the food supply

APPENDIX 3: Objectives and principles for a FoPL system

Front of pack labelling Project Committee

Objectives and principles for the development of a front-of-pack labelling (FoPL) system

Context:

In December 2011, the Legislative and Governance Forum on Food Regulation (FoFR) agreed to support Recommendation 50 of *Labelling Logic: Review of Food Labelling Law and Policy* (the Blewett Review), namely that an interpretive Front-of-Pack Labelling (FoPL) system should be developed. In its response, FoFR was careful to emphasise its view that the divergence of stakeholder views regarding FoPL means that *government is best placed to lead a collaborative process* to deliver on this task. However, FoFR was also careful to point out that the *food labelling regulatory framework must strike a balance between seeking to ensure good public health outcomes (both short and longer term) and ensuring a strong and profitable food industry*.[21]

FoFR therefore proposed to undertake a collaborative design process with industry, public health and consumer stakeholders, with a view to reaching a broad consensus on a possible approach to interpretive FoPL.[22] The stated aims and objectives of the process were to:

- move away from the current divisive debate and polarised views by building on the common ground among stakeholders;
- focus on addressing issues of concern, exploring new approaches and exploring possibilities for building on existing schemes;
- help avoid the proliferation of different FoPL systems and the potential for consumer confusion from conflicting or inconsistent nutrition messages.[23]

The FoFR response also stated that *"[i]t is important that consensus is on the basis that the approach adopted achieves the aims and objectives set out in the* [Australia and New Zealand Food Regulation Ministerial Council] *Policy Statement*." A copy of the Policy Statement is attached for reference, but key elements are extracted below to assist in discussion.

To give effect to the FoFR wishes the Department of Health and Ageing has convened a FOPL Project Committee of stakeholders to develop Front of Pack Labelling System

To provide a foundation for the Project Committee's task of developing a front-of-pack labelling system, this paper focuses upon three key elements of any system design process – namely objectives, scope and system design principles.

Objectives of a FoPL System:

According to the FOFR Policy Statement:

A FOPL scheme is a scheme that can guide consumer choice towards healthier food options and aims to:

Guide consumer choice by:

1. Enabling direct comparison between individual foods that, within the overall diet, may contribute to the risk factors of various diet related chronic diseases.
2. Being readily understandable and meaningful across socio-economic groups, culturally and linguistically diverse groups and low literacy/low numeracy groups.
3. Increasing awareness of foods that, within the overall diet, may contribute positively or negatively to the risk factors of diet related chronic diseases.

[21] Legislative and Governance Forum on Food Regulation (convening as the Australia and New Zealand Food Regulation Ministerial Council) Response to the Recommendations of *Labelling Logic*: *Review of Food Labelling Law and Policy (2011); Page8*

[22] Above, n1; *Page 52*

[23] Above, n1; *Page 52*

For the purposes of the Project Committee's work, this objective can more succinctly be expressed as:

'To provide convenient, relevant and readily understood nutrition information and/or guidance on food packs to assist consumers to make informed food purchases and healthier eating choices.'

Scope:

The Project Committee will develop a FoPL system combining both interpretive and informative elements within the following parameters:

- One system will be developed that is widespread, simple and interpretive
- The priority focus will be packaged, manufactured or processed foods presented ready for sale to the consumer in the retail sector.

Design and Implementation Principles:

In its response, FoFR explicitly stated that the collaborative approach should include consideration of the possibilities for building on existing schemes. It is therefore critical that a set of criteria be developed against which both new and existing schemes can be considered. In the context of this paper, these criteria are referred to as design and implementation principles, which are as follows:

Design

1. The FoPL system should synthesize, simplify and translate substantiated nutritional information and present it to inform food choice and support healthy eating.
2. The system should be widely understood including by those most at risk from poor nutrition and associated health risks.
3. The system may be based on symbols, numbers, words, colours and/or quantifiable attributes of the food products, or combinations of these elements.
4. The system should enable appropriate comparisons between foods based on agreed and consistent measures.
5. The system should be aligned with other food regulation, public health policies, and authoritative sources of dietary advice including:
    a. Australian Dietary guidelines
    b. Ministerial Guidelines and Statements
    c. Nutrition, Health and Related claims regulations and industry codes.
6. The system should be based on elements that inform choice on balance by assessing both health-benefit and health-risk associated food components.
7. The system should comprise both the FoPL scheme and consumer education elements.

Implementation

8. Implementation must be practical, widespread, properly resourced and consistent with the agreed system.
9. The system must include stakeholders in a formal and agreed ongoing process of engagement.
10. The system should be fully and effectively monitored and evaluated both at a fixed time and on an ongoing basis, based on evidence, and against agreed performance indicators.
11. Implementation should include a well-resourced, on-going social marketing program led by Government and supported by industry and the wider public health sector

APPENDIX 4: NPSC development

The NPSC had been developed as part of the FSANZ work on Proposal P293 Nutrition, health and related claims[7]. In that process, FSANZ had examined seven models to capture risk increasing and health benefit components of food, which mainly used nutrients that were mandatory declarations in the NIP. It was found that for health claims purposes a scoring model would be more effective than a threshold approach with cut-off points for single nutrients or multiple single nutrients in providing a picture of the overall nutritional quality of individual foods. It also did not suffer from the disadvantage that a series of new food categories would need to be defined in the Code.

A nutrient profiling tool was designed in the UK between 2003-2005 for the purpose of 'tightening the rules for broadcast limiting advertising of foods that are high in fat, saturated fat, salt or sugar to children'. This used a dichotomous classification of food and was considered suitable as a starting point for the development of the NPSC, noting it had some gaps in that it did not perform well for fats/oils and cheeses in particular (Rayner et al 2009[24]).

The underpinning evidence for the development of the system was based on a risk matrix approach, using research on risk predictions for cardiovascular disease. A representation of the risk matrix approach from New Zealand research is given in Appendix 4, Figure 3 (Jackson 2000).[25]

In developing the NPSC as part of Standard 1.2.7 Nutrition and health claims for the purpose of determining eligibility of individual foods for health claims, FSANZ made some alterations to the UK model, including separating fats/oils and adding hard cheese to form a new category, raising the protein tipping point and increasing the number of points scored by a food that was 100% fruit, vegetable, nuts or legumes (% FVNL). This enabled plain nuts, for example, to carry a health claim[5].

[24] Rayner M, Scarborough P, Lobstein T, 2009, The UK Ofcom Nutrient Profiling Model: Defining 'healthy' and 'unhealthy' foods and drinks for TV advertising to children: https://www.ndph.ox.ac.uk/cpnp/files/about/uk-ofcom-nutrient-profile-model.pdf

[25] Jackson R, 2000, Updated New Zealand cardiovascular disease risk-benefit prediction guide, *BMJ*; 320:709-10: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1117717/

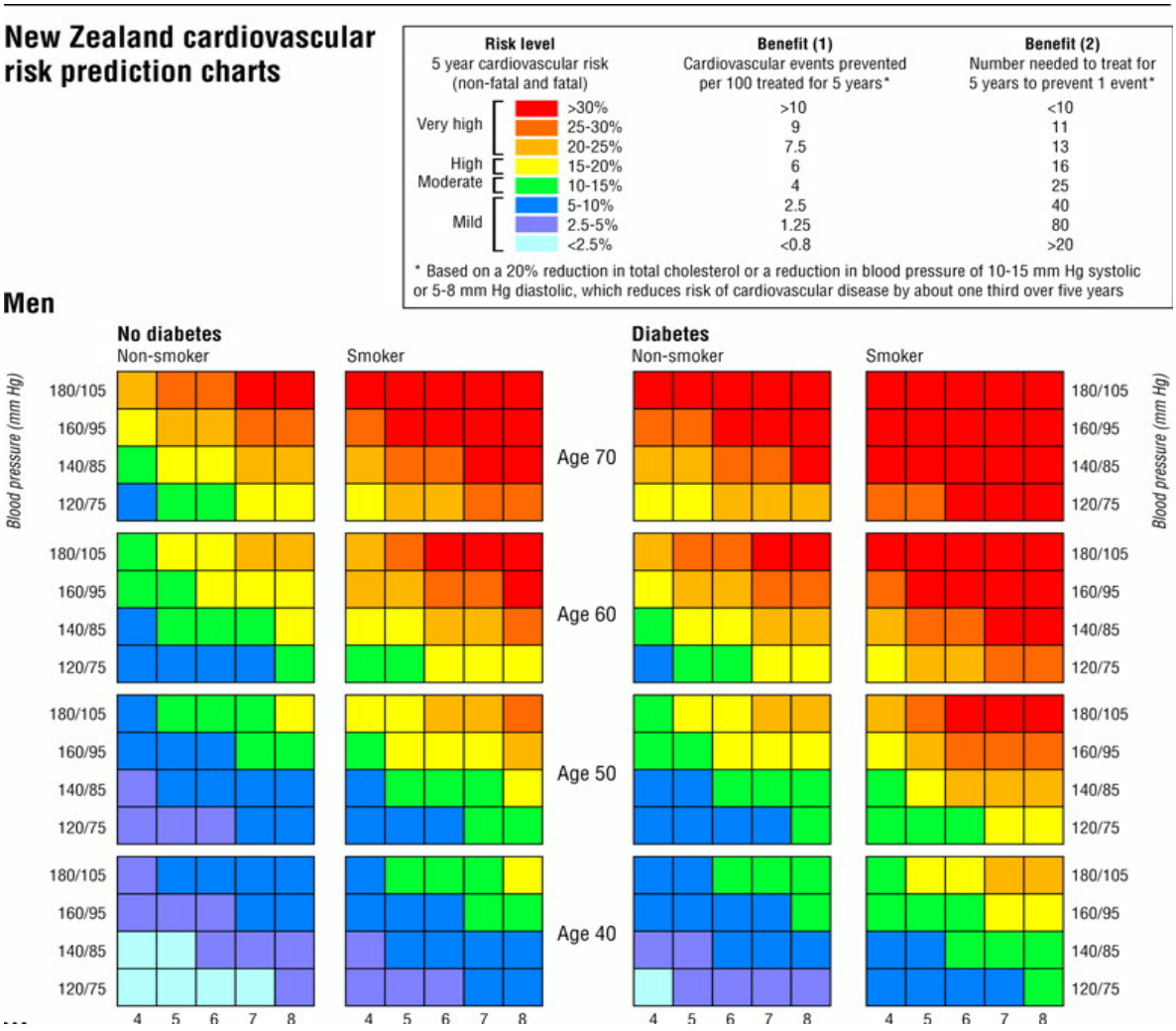
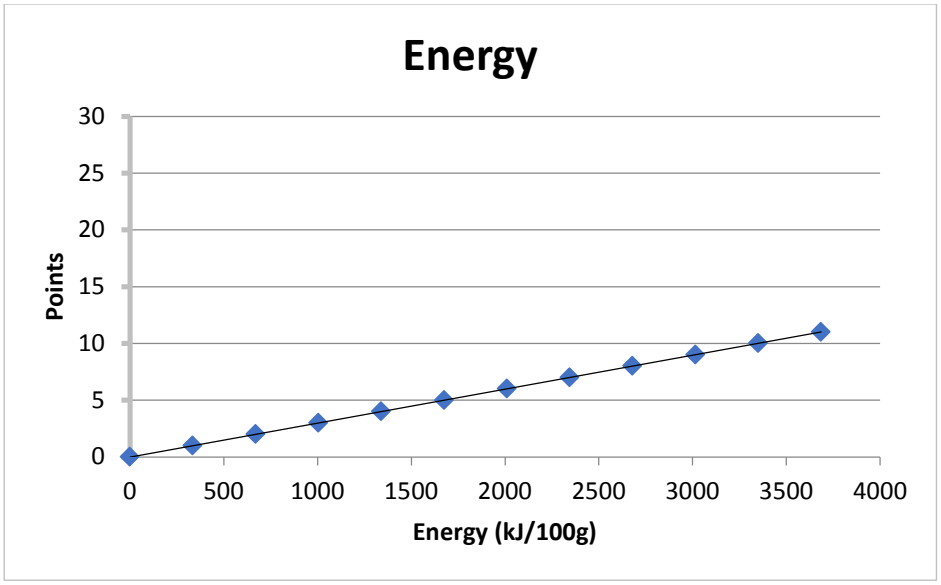
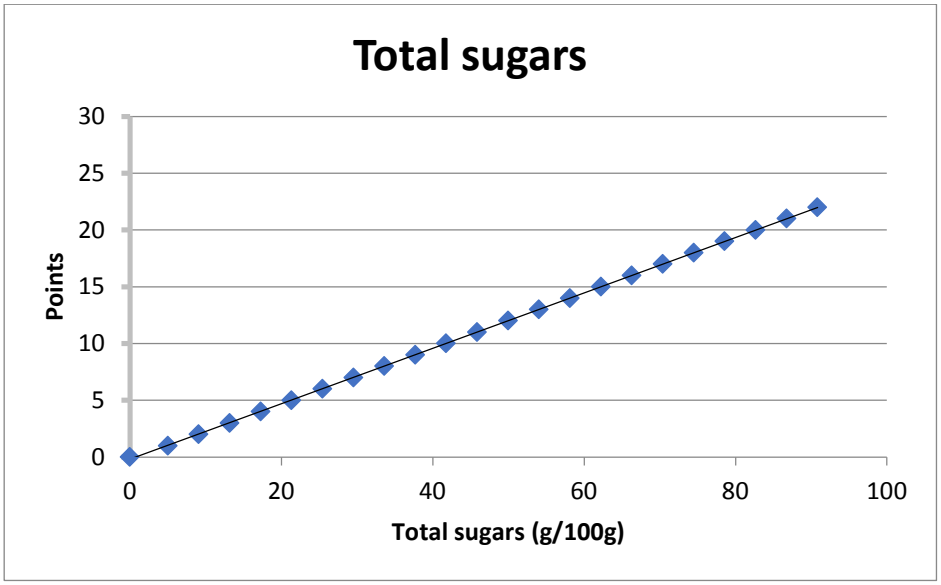


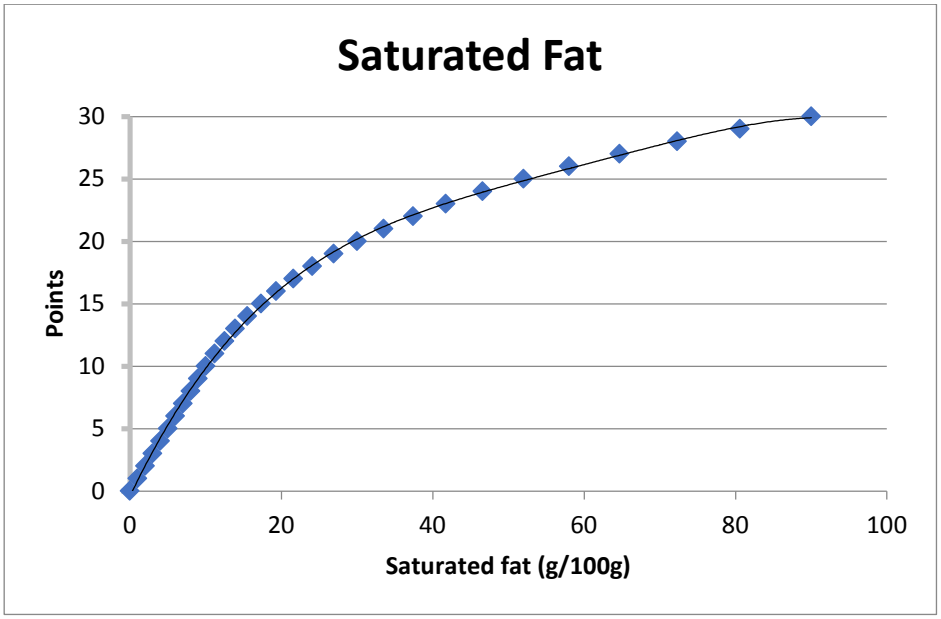
Figure 3: Risk prediction chart for cardiovascular disease

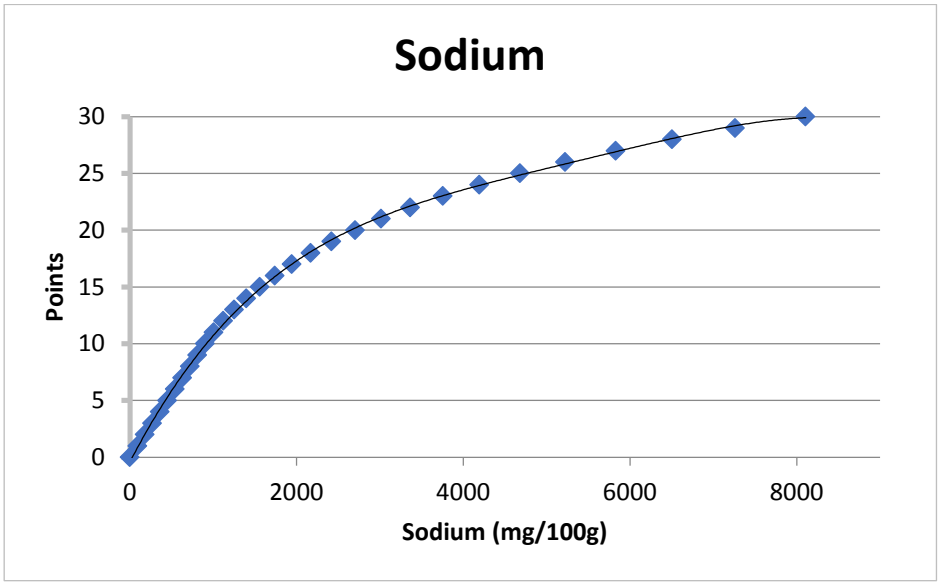
APPENDIX 5: Scaling HSR nutrient and food components

Negative components – baseline points for Categories 1, 2





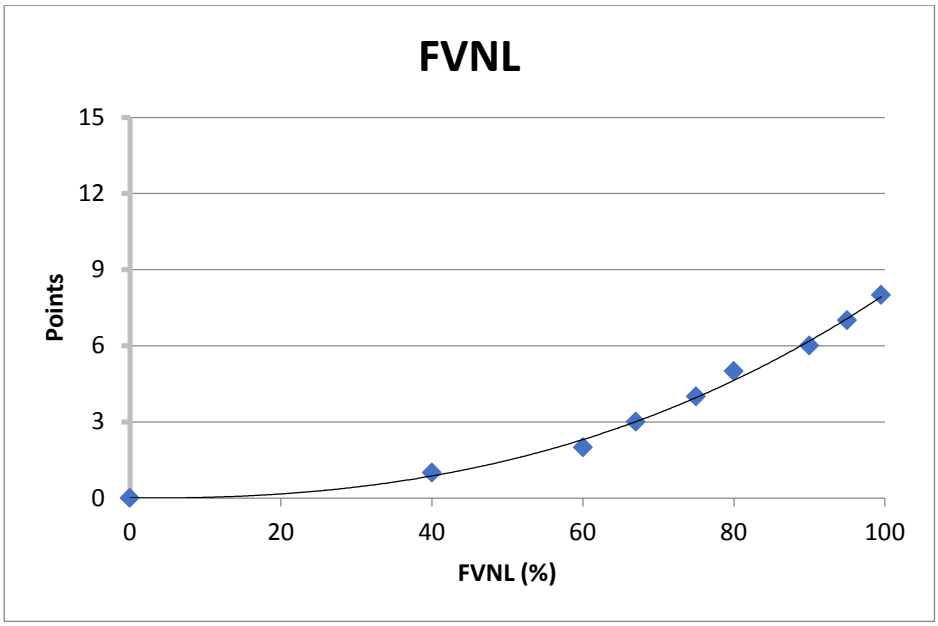


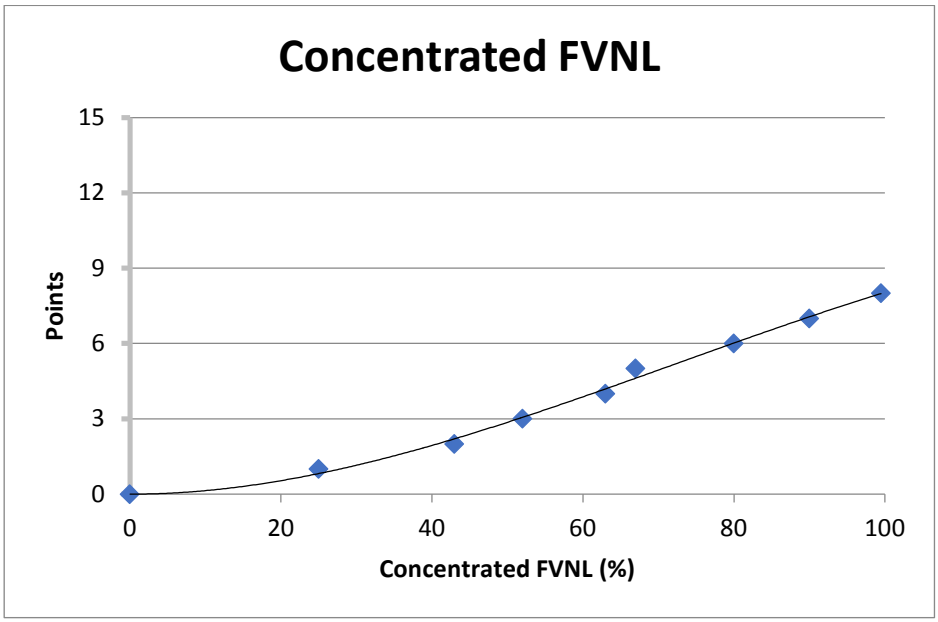


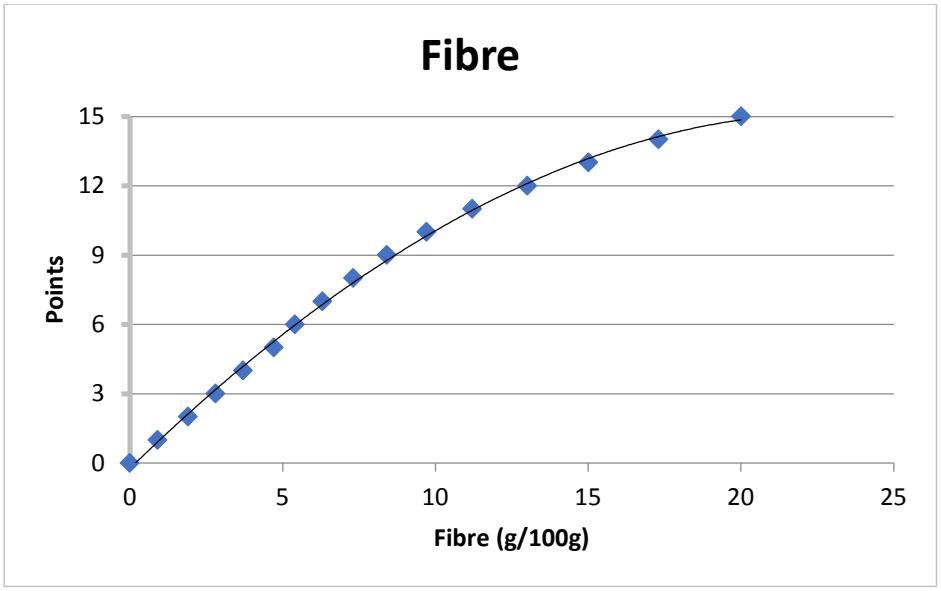
Notes on changes to HSR point scales compared to the NPSC point scales:

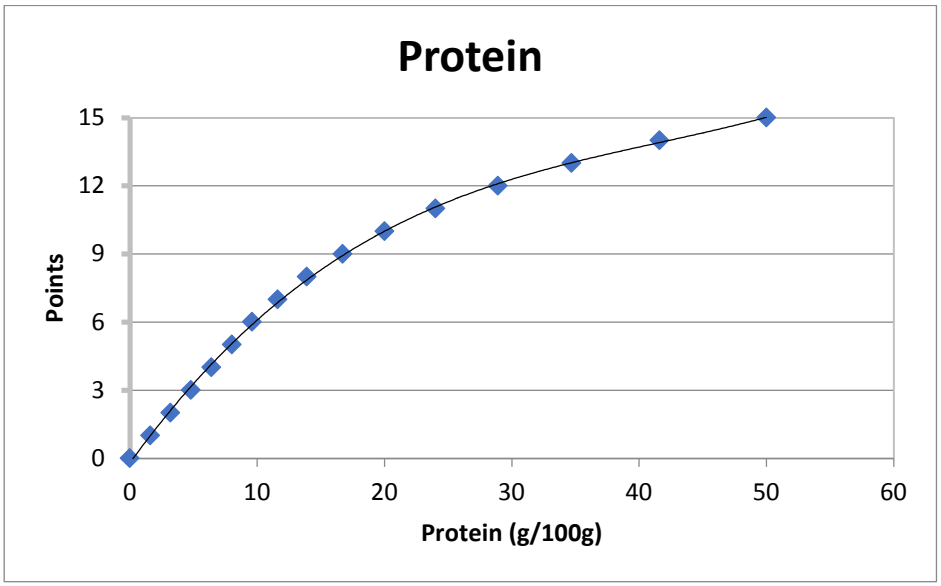
- The scope for Energy remains as per the NPSC (contributing up to 11 Baseline points)
- Sugar extends to 100% content (contributing up to 22 points), originally 45% content and 10 points
- Saturated Fat extends to 90% content (contributing up to 30 points), originally 10% content and 10 points
- Sodium extended to 8106 mg/100 g (contributing up to 30 points), originally 900 mg/100g and 10 points
- Category 3 foods (Oils/spreads/hard cheeses) use the original NPSC point scales as there is adequate “capacity” in the nutrient ranges to cover all foods of this type.

Positive components – offset points for Categories 1, 2









Notes on changes to HSR point scales compared to the NPSC point scales:

- FVNL and conc. FVNL tables cover up to 100% content as do the NPSC point scales (contributing up to 8 points), but are now in-filled between previous points
- Fibre extends to 20% (contributing up to 15 points), originally 4.7% and 5 points
- Protein extends to 50% (contributing up to 15 points), originally 8% and 5 points.