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Letter to the Editor

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Response to two Letters to the Editor: we maintain that ultra-processed supermarket foods are less healthy than their minimally processed counterparts

Madam

Recently, a Letter to the Editor from Katherine Rich, CEO of the New Zealand Food & Grocery Council, was published in *Public Health Nutrition*[1]. This letter questions the validity of the scientific methods and conclusions presented in our paper 'Ultra-processed foods have the worst nutrient profile, yet they are the most available packaged products in a sample of New Zealand supermarkets'[2]. Miss Rich's main concerns are related to the way we have used the Nutrient Profiling Scoring Criterion (NPSC) algorithm to determine the healthiness of packaged food products in relation to their level of industrial processing; she is worried that due to our methods the 'results will be heavily biased against processed foods'[1]. Later, we received a second letter from Dorothy Mackerras, also expressing concerns about our use of the NPSC, but with no concerns about our main conclusions[3]. We agree that our use of the NPSC had some important limitations (most clearly explained in the paper) and both letters raise some valid questions. However, none of the issues raised would change the main conclusion of our paper, that 'The majority of packaged foods in NZ supermarkets are ultra-processed and these foods are also the least healthy.' Below we address the four main issues outlined in the letter by Miss Rich. The issues raised in the second letter overlap with these concerns and relate to: not using all seven components of the NPSC (see 1); not considering different scores for different foods (see 1); and not dichotomizing the final NPSC (see 2).

1. We did not use the full Nutrient Profiling Scoring Criterion

The first and main concern raised is that we did not consider the full NPSC. Indeed, our paper transparently describes that we did not allocate positive points for fibre (F points) and fruit, vegetable, nut and legume (FNVL) content (V points) because this information was missing for many products in our database (i.e. only 25 % of products listed fibre on the Nutrition Information Panel). We agree this is an important limitation and to determine the impact this might have had on our findings we have re-analysed our data including all F and V points. For this purpose, standard V points were allocated at sub-category level based on ingredient information on the Nutrition Information Panel. Fibre points were calculated from the Nutrition Information Panel where data were available or imputed where data were missing using the mean values for similar products in that category or using data from the New Zealand (NZ) Food Composition Database[4] when no sufficient data were available in our database. We then recalculated the NPSC now including all required points (Table 1). Results show that, while the NPSC is indeed lower (indicating healthier) in all three groups, the score is still significantly lower (better) in the minimally processed group (−3·88) compared with the culinary (5·92) and ultra-processed food groups (8·00; worst score). This means that our main conclusion ('The majority of packaged foods in NZ supermarkets are ultra-processed and these foods are also the least healthy') remains unchanged.

A related concern raised was that it is incorrect to 'compare the NPSC across all foods' and that we should have taken the three major categories of the NPSC profiler based on energy density into account. We addressed this concern by analysing the data separately for the three NPSC groups (Table 2). Results show that ultra-processed foods in both Category 1 and 2 (where the majority (93 %) of food sits) still have a significantly worse NPSC compared with culinary and minimally processed foods ($P < 0{\cdot}001$). This means that our original conclusion remains unchanged. For Category 3 foods (cheeses, edible oils, butter and margarine) the NPSC is better for ultra-processed compared with culinary processed foods. However, no foods in this category were classified as minimally processed so we cannot say how that would impact the overall finding for this category.

2. The Nutrient Profiling Scoring Criterion was used beyond its purpose

The second main concern raised in both Letters to the Editor[1,3] is that we used the NPSC beyond its purpose. The NPSC was developed by Food Standards Australia New Zealand for the regulation of health claims[5]. Products receive points based on both positive and negative nutrients and this score is then dichotomized to decide whether a product qualifies for a health claim (yes/no). Both letters suggest that using the NPSC as a continuous score (as we did in our paper) is therefore incorrect. However, in most cases in science, when continuous measures are available, these are preferred to dichotomous measures[6]. Nevertheless, we re-analysed our data by dichotomizing all the foods based on their qualification to display a health claim (yes/no), again considering the three NPSC food groups separately. Results are presented in Table 3. In agreement with the findings for our

Table 1 Nutrient profiling score for a sample of packaged foods in New Zealand supermarkets (*n* 6020) by level of industrial processing

	Group 1: Minimally processed			Group 2: Culinary processed			Group 3: Ultra-processed			
	n	Mean	SD	*n*	Mean	SD	*n*	Mean	SD	ANOVA* *P* value
NPSC score overall	622	−3·88	5·11	332	5·92	10·7	5066	8·00	7·87	<0·001

NPSC, Nutrient Profiling Scoring Criterion.
*Results from ANOVA; the Welch and Brown–Forsythe test was used when a difference in variance between the groups was observed.

Table 2 Nutrient profiling score for a sample of packaged foods in New Zealand supermarkets (*n* 6020) by level of industrial processing and by NPSC category

	Group 1: Minimally processed			Group 2: Culinary processed			Group 3: Ultra-processed			
	n	Mean	SD	*n*	Mean	SD	*n*	Mean	SD	ANOVA* *P* Value
NPSC Category 1 (beverages)	186	−5·00	2·56	–	–	–	192	4·05	5·87	<0·001
NPSC Category 2 (all foods not in Category 1 or 3)	436	−3·40	5·81	225	−0·56	5·89	4551	7·57	7·83	<0·001
NPSC Category 3 (cheese, edible oils, margarine and butter)	–	–	–	107	19·5	2·96	323	16·4	2·3	<0·001

NPSC, Nutrient Profiling Scoring Criterion.
*Results from ANOVA; the Welch and Brown–Forsythe test was used when a difference in variance between the groups was observed.

Table 3 Number and percentage of packaged food products in New Zealand supermarkets (*n* 6020) qualifying for a health claim by level of industrial processing

	Health claim*			
	Yes		No	
	n	%	*n*	%
Group 1: Minimally processed	590	95	32	5
Group 2: Culinary processed	295	89	37	11
Group 3: Ultra-processed	2080	41	2986	59
Overall	2965	49	3055	51

*$P<0·001$ (χ^2 test).

continuous data above, we found that less processed foods were significantly healthier than more processed foods; that is, 95 % of minimally processed foods would qualify for a health claim compared with only 41 % of ultra-processed foods. Our findings are similar to those reported by Rosentreter *et al.*, showing that 38 % of a selection of NZ packaged food products would be eligible to carry a health claim[7]. We agree that future research should normalize the NPSC or the Health Star Rating (HSR) when used as a continuous score in analysis.

3. We should have used the Health Star Rating instead of the Nutrient Profiling Scoring Criterion

The third concern raised is that we used the NPSC to determine how healthy a product is, while there is now a new (and improved) nutrient profiling system available in Australia and NZ: the front-of-pack HSR Calculator. We acknowledge this, but the HSR system was not available to us at the time of data analysis for our paper (April/May 2014). The Guide for Industry to the HSR system, the HSR Style Guide, the HSR Calculator and the anomalies process were first made available on the Australian Health Ministers' Advisory Council website after its meeting on 27 June 2014. Furthermore, the availability of this new system is no reason to suggest the NPSC is invalid, particularly because the NPSC is currently still being used in NZ to determine products eligible to display health claims.

4. Incorrect listing of New Zealand food and beverage companies

A final point raised in the first letter[1] is that we made errors in referring to specific NZ food and beverage companies, particularly that we failed to list Sanitarium and Kellogg's as the two largest breakfast cereal companies. We had been alerted to this issue prior to publication of Miss Rich's letter and as such had previously checked our data, finding that our original data indeed listed Sanitarium and Kellogs's as the two main breakfast cereal companies in NZ. A corrigendum has been published to address this. We appreciate that this mistake was pointed out to us by the author.

Conclusions

In summary, we acknowledge our study limitations, but maintain that the main conclusions of our paper are justified. Both our original analysis and new analysis undertaken for this response (including F and V points; separately analysing NPSC energy density categories; using dichotomous scores) consistently show that ultra-processed foods from NZ supermarkets are significantly less healthy than their minimally processed counterparts. We appreciate the responses to our paper, which will be beneficial for future research using the NPSC.

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Wilma E Waterlander[1], Claire M Luiten[2], Helen Eyles[1] and Ingrid HM Steenhuis[2]

[1]National Institute for Health Innovation
School of Population Health
Tamaki Campus
The University of Auckland
Private Bag 92019, Auckland Mail Centre
Auckland 1142, New Zealand
Email: w.waterlander@nihi.auckland.ac.nz

[2]Department of Health Sciences and the EMGO Institute for Health and Care Research
Faculty of Earth and Life Sciences
VU University Amsterdam
Amsterdam, the Netherlands

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