

CHANGES IN THE NUTRITIONAL PROFILE OF PACKAGED FOOD AND BEVERAGE PRODUCTS FROM 11 LARGE COMPANIES IN INDIA OVER A THREE-YEAR PERIOD

Prepared by Elizabeth Dunford and Fraser Taylor for the Access to Nutrition Initiative

Contact

Dr Elizabeth Dunford
The George Institute for Global Health
edunford@georgeinstitute.org.au



ABBREVIATIONS

ATNI – Access to Nutrition Initiative

HSR – Health Star Rating

WHO – World Health Organization

WHO Euro – World Health Organization European Regional Office nutrient profile model

WHO SEAR – World Health Organization South East Asian Region nutrient profile model

DISCLAIMER

The George Institute for Global Health (The George Institute) prepared this report. Sections of this report involving analysis of sales-weighted data were prepared by ATNI under the terms of their licence to use Euromonitor International data.¹ In addition, ATNI commissioned additional product composition data from Innova Market Insights for the 2020² India *Product Profile*.³ ATNI is to assume responsibility for this aspect of the analysis.

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¹ Euromonitor International is an independent, privately owned global market research firm conducting in-country research in 100 countries worldwide analysing 26 consumer industries including; Hot Drinks, Packaged Food and Soft Drinks. Euromonitor International produces historic and forecast cross-comparable market data and strategic reports to narrate the current and future drivers shaping each one.

² Analysis for the 2020 India Product Profile was performed in 2019, using data from products on the Indian market in 2018 and applying sales-weighting data related to Financial Year 2018.

³ Innova Market Insights is a commercial knowledge supplier for the Food and Beverage industry.

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EXECUTIVE SUMMARY

The overall goal of this work was to provide stakeholders, including companies, government, nutrition experts and others with an understanding of how the nutritional quality of packaged food and non-alcoholic beverage products sold by the largest manufacturers in India has changed over time. Nutrient information for 821 packaged food and beverage products in 2016 and 1288 in 2019 sold by 11 large manufacturers in India were included in this analysis. Nutrient information was obtained either from product packaging, or directly from the manufacturer, using the methods described in the 2016 India *Product Profile* and the 2020 India *Product Profile*. As the 2016 India *Product Profile* and 2020 India *Product Profile* did not use the same manufacturers, only those manufacturers with data available in both years were included in this analysis.

The Australian Health Star Rating (HSR) system was used to assess the healthiness of company product portfolios, following the methods used in the 2016 and 2020 Product Profile reports. Each company was then ranked by the mean HSR of their product portfolio, both with and without sales-weighting using data from Euromonitor International. As a secondary objective, the levels of energy (kJ/100g), saturated fat (g/100g), sodium (mg/100g) and total sugars (g/100g) were also examined, both by each company overall, and by food or beverage category for each company. Where nutrient data were unavailable for specific manufacturers, this was also reported.

The mean healthiness of the 11 companies' products was found to be low overall at both time points, at 1.9 stars out of 5.0 in 2016 and 1.8 stars out of 5.0 in 2019. The change in mean HSR was non-significant when assessed at the aggregated level across all companies. Sales-weighting changed the rankings of the companies in relation to healthiness and it generally increased the disparities observed between companies. Comparing the results between 2016 and 2019, sales-weighting had an effect on the results for the assessed companies.

In 2019 a large improvement was seen in terms of labelling of saturated fat values, with four companies (Britannia Industries, Mondelez India, Nestle India and PepsiCo India) having 100% of their products labelling saturated fat values and the majority of remaining companies still showing an increase in the proportion of their product range reporting saturated fat values. There was a slight decrease overall in the proportion of products that had missing sodium values between 2016 (74% missing) and 2019 (64% missing) however sodium was still the nutrient with the most missing values on products from these 11 manufacturers. There was an increase in the proportion of products that had missing total sugar values between 2016 (7% missing) and 2019 (14% missing) however total sugar had the lowest proportion of missing values than when compared to sodium and saturated fat.

There were significant strengths and some important weaknesses to the analyses undertaken in this report. For example, in 2020 seven companies were willing to provide a list of their product portfolio. This is a major improvement compared to the response rate in 2016 when a first iteration of this assessment was performed where only one company provided full nutrient data, however, it remains difficult to determine what market coverage was achieved by the inclusion of these products. On balance, it is reasonable to conclude that the average healthiness of the products provided and sold by the largest Indian food companies is sub-optimal. Further, there are important differences between companies that could be addressed by investments that target improvements in the product mix as well as the reformulation of less healthy products to better compositions.

INTRODUCTION

The George Institute for Global Health's mission is to improve the health of millions of people worldwide. More specifically, the Food Policy Division works to reduce rates of death and disease caused by diets high in salt, saturated fat, sugar and excess energy, by undertaking research and advocating for a healthier food environment. The Division's main areas of activity are quantifying the healthiness of the food supply, encouraging food reformulation, and developing innovative approaches to encourage consumers to make healthier food choices.

In 2019, The George Institute was commissioned by the Access to Nutrition Initiative (ATNI) to examine whether the mean healthiness of packaged food and beverage products from leading manufacturers operating in India have changed between the release of the first India Product Profile in 2016 and the release of the 2020 India Product Profile. The 2016 and 2020 India *Product Profiles* input into ATNI's India Spotlight Index. The Index scores and ranks the contribution of India's largest food and beverage manufacturers to tackling the country's double burden of malnutrition. It consists of an analysis of those companies' policies, practices and disclosures (the *Corporate Profile*), which includes an analysis of the nutritional quality of each company's food and beverage products in the Indian market (the *Product Profile*). In contrast to the first ATNI India *Spotlight Index* published in 2016, the 2020 *Product Profile* was integrated into part of Category B within the India Spotlight Index 2020.

The George Institute was selected to undertake this study given its established presence in India with offices in Hyderabad, Bangalore and New Delhi, and its existing FoodSwitch India database, which contains food composition data for over 10,000 products in the Indian food supply. The George Institute also undertook analysis related to both the 2016 India *Product Profile* and 2020 India *Product Profile*. For the India Spotlight Index 2020, a collaboration was established with Innova Market Insights to provide additional food composition data from their database to ensure the coverage of company portfolios was optimal and the most up to date product data could be selected. The ATNI team, who had access to sales data from the Euromonitor database through a licensing agreement, also did a series of subsidiary sales-weighted analyses that have been included in this report.

This report sets out the objectives, methods, results and interpretation of the comparative analysis examining changes in the healthiness of packaged food and beverage products using data from the India *Product Profile* analysis done in 2020 for the India *Spotlight Index* 2020 and the 2016 India *Spotlight Index*.

OVERALL GOAL AND SPECIFIC OBJECTIVES

The overall goal of this work was to provide stakeholders, including companies, government, nutrition experts and others with a fuller understanding of changes that have occurred in the nutritional quality of packaged food and non-alcoholic beverage products (hereafter “foods and beverages”) sold by the largest manufacturers in India between 2016 and 2019.⁴ Specific objectives were to answer the following questions:

1. *How has the average nutritional quality of each company's product portfolio changed between 2016 and 2019 and how do companies compare?* The metric used was the mean Health Star Rating of the product portfolio.
2. *How has the average sales-weighted nutritional quality of each company's product portfolio changed between 2016 and 2019 and how do companies compare?* The metric used was the sales-weighted mean Health Star Rating of the product portfolio.
3. *How have the average levels of energy (kJ/100g), saturated fat (g/100g), total sugar (g/100g) and sodium (mg/100g) changed between 2016 and 2019 and how do companies compare?*
4. *How have the average levels of energy (kJ/100g), saturated fat (g/100g), total sugar (g/100g) and sodium (mg/100g) changed between 2016 and 2019 in each food and beverage category for each company?*

METHODOLOGY

Selection of companies

ATNI requested The George Institute to include the products of 11 manufacturers for which data was available in both the *2016 India Product Profile* and the *2020 India Product Profile*. The included companies, in alphabetical order, with the name used throughout this report in brackets are:

1. Britannia Industries Limited (Britannia Industries)
2. Coca-Cola India (Coca-Cola India)
3. Gujarat Cooperative Milk Marketing Federation (Amul)
4. Hindustan Unilever Limited (Hindustan Unilever)
5. ITC Limited (ITC)
6. Karnataka Cooperative Milk Producers Federation (KMF Nandini)
7. Mondelez India Foods Private Limited (Mondelez India)
8. Mother Dairy Fruit & Vegetable Private Limited (Mother Dairy)
9. Nestlé India Limited (Nestlé India)
10. Parle Products Private Limited (Parle Products)
11. PepsiCo India Inc (PepsiCo India)

Choice of nutrient profile models

Nutrient profiling is the science of classifying or ranking foods according to their nutritional composition for the purpose of preventing disease and promoting health.⁵ Nutrient profile models have been developed by academics, government departments, health-related charities and the food industry for a variety of applications including: to underpin food labelling; to regulate advertising of products to children; and to regulate health and nutrition claims. Although nutrient profiling is a tool to quantify aspects of individual foods, not diets, nutrient profile models are commonly used to underpin policies designed to improve the

⁴ Note that nutritional quality for the purposes of this report does not include assessment of whether products have been fortified with micronutrients.

⁵ World Health Organization, Nutrient Profiling <http://www.who.int/nutrition/topics/profiling/en/>

overall nutritional quality of diets. The *2016 India Product Profile* and *2020 India Product Profile* utilised the Australian Health Star Rating to evaluate the healthiness of each company's product portfolio.

The Australian Health Star Rating (HSR) is a front-of-pack interpretive nutrition labelling system designed to assist consumers in making healthier choices. The underlying nutrient profile model assesses risk nutrients (overall energy, sodium, total sugar, saturated fat) and positive nutrients (fruit and vegetable content, protein, fibre and in some cases, calcium) to score products on the basis of nutritional composition per 100g or 100mL across one of six categories. These scores are then converted to a 'Health Star Rating' from ½ to 5 stars.

Development was led by the Australian government in collaboration with industry, public health and consumer groups, and builds upon the Nutrient Profiling Scoring Criteria (NPSC) previously developed by the Australian and New Zealand Governments to regulate health claims.⁶ The NPSC itself was developed from United Kingdom's OFCOM model. The HSR has been implemented in Australia since June 2014 on a voluntary basis. The system has also been adopted in New Zealand. Further detailed information is available [online](#).⁷ One change in HSR rules that has been implemented for the purposes of the 2020 Index relates to products that require additional ingredients (other than water) for consumption. In the 2016 Index "as prepared" nutrient values for these products, if available, were used in analysis, however for the 2020 Index "as sold" values have been used for analysis due to changes in the HSR rules.

⁶ See Australia New Zealand Food Standards Code, Standard 1.2.7

⁷ Department of Health, Australian Health Star Rating website: <http://healthstarrating.gov.au>

Table 1 Information about the HSR algorithm


	HSR
Country/region of origin	Australia
Date of development	2014
Scoring method	Negative nutrients score is combined with positive nutrients score to arrive at a final 'score' which is then converted to a Health Star Rating from 0.5 to 5.0.
Positive nutrients	Protein Fibre Fruit, vegetable, nut and legume content (FVNL) Calcium
Negative nutrients	Energy Saturated fat Total sugars Sodium
Original purpose of development and existing applications	Front-of-pack nutrition labelling.
Original scoring system	Depending on which category the product falls in, the 'score' is converted to a Health Star Rating from 0.5 to 5.0 stars that can be displayed in a logo on the front of pack.

To work optimally, nutrient profile models such as the HSR rely on the availability of comprehensive nutrition information. In the Indian context, national nutrition labelling legislation generally only requires the display of energy content (in kilocalories), protein, carbohydrates, total sugars and total fats.⁸ Amounts of other nutrients are only required where a nutrient content claim is made. Table 2 below displays the alignment between nutrients required for the operation of the nutrient profile models, and those required to be declared on Indian nutrition labels.

⁸ Food Safety and Standards (Packaging and Labelling) Regulations 2011 (India)

Table 2 Alignment of nutrients required for the HSR calculation with those required by Indian labelling legislation

	Indian Regulations	HSR
Total number of nutrients required	5	8
Protein	✓	✓
Fibre		✓
Fruit and vegetable content		✓
Energy	✓	✓
Total fat	✓	
Saturated fat		✓
Monounsaturated fat		
Trans fat		
Carbohydrate	✓	
Total sugars	✓	✓
Added sugars		
Other sweeteners		
Sodium		✓
Calcium		✓
Number of nutrients aligned to Indian legislation		3/5

 = nutrients required by both the HSR and Indian labelling legislation

Calculating a nutrient profile score for a product requires values for all data points used by the nutrient profile model and imputation of missing data was therefore required for India.

Eligibility of food and beverage products

Foods and beverages eligible for inclusion were defined as ‘*all packaged foods and non-alcoholic beverages manufactured by the included companies available for purchase in India.*’ A food or beverage was considered a unique item based upon the brand name and description irrespective of serving size and packaging (i.e. a specific brand of cola sold in 330mL cans was considered to be the same food item as the same specific brand of cola sold in 600mL bottles). However, if two products with the same name and description existed yet had different nutrient values, both products were retained in analysis.

The following products were excluded from analyses:

1. Unprocessed meat, poultry, fish and raw agricultural commodities such as plain cereals (on the basis that such foods are not generally required to carry a nutrient declaration)
2. Plain tea and coffee (on the basis that these make an inherently low nutritional contribution and are thereby not required to display a nutrient declaration)
3. Condiments such as herbs, salt, pepper, vinegars and spices (on the basis that these make an inherently low nutritional contribution and are thereby not required to display a nutrient declaration)
4. Infant formulas, and baby food and baby beverages (excluded because these products are not consumed by the general population and the selected models are not appropriate for their evaluation).

Product identification

In 2016, The George Institute’s FoodSwitch India database was used to compile product lists for manufacturers. The approach used was as follows:

- Products in the FoodSwitch India database with data entered or updated after 1 July 2014 (an approximately two-year period prior to this analysis)
- Products identified between June and August 2016 by in-store surveys done at retail and wholesale outlets in Hyderabad, Bangalore, Delhi and surrounding areas. Permission was obtained from store owners and using a smartphone app, data collectors attended each site and systematically photographed publicly available nutrition information displayed on the product packaging, which was then uploaded and added to the FoodSwitch India database. Where a product was captured more than once, nutrition information was extracted from the most recent photograph of the item.

Product lists along with nutrition information were supplied to each manufacturer, and manufacturers were requested to check the information and update it where necessary. However, only three of the included companies (Hindustan Unilever, Mother Dairy and Britannia) accepted the offer to supply their full product list and only one manufacturer (Hindustan Unilever) also provided nutrition information for its products. An iterative process of review was used to obtain as complete a listing of products as possible whereby the products collected in-store were checked against any product portfolio information provided by companies, and information publicly available on company websites and in two large Indian online retailers. Products identified as missing were targeted for collection.

In 2020, two data sources were used to create a product list for each manufacturer:

- Products in the FoodSwitch India database with data entered or updated after 31 December 2016 (all products since the 2016 *Product Profile*)
- Products from Innova Market Insight's database with data entered or updated between 1 February 2015 and 31 December 2018

The FoodSwitch India and Innova market Insight databases were merged, and where the same product was available in both databases, the most recent entry was used in the present analysis. In July 2019, the 16 companies were provided with their data for review (product list and nutrient content) and offered an opportunity to make corrections or additions to information about their product range. Seven companies did so (Britannia Industries, Coca-Cola India, Hindustan Unilever, KMF Nandini, Mondelez India, Nestle India and PepsiCo India) and any corrected or new information was updated in the project database.

Imputation of essential missing data

For the majority of products the available nutritional information was insufficient to apply the selected nutrient profile model. It was therefore necessary to impute missing data which was done as follows:

- Proxy values for total fat, saturated fat, total sugar, sodium, fibre and 'fruit vegetable nut and legume' (FVNL) content were developed by using available data for 411 food categories and more than 10,000 products in the full FoodSwitch India database (regardless of manufacturer). The average value of the products with available data was estimated for each category and assigned to those products in that category with missing data.
- For added sugars a standard proportion of total sugars was assumed and was specified at the category level:
 - For cakes and desserts, confectionery, sauces and beverages (excluding milk), total sugar values were assigned as '*added sugars*'
 - For milks and yoghurts, an amount of sugar of up to 6g/100g and 8g/100g respectively was considered to be naturally occurring. These are reasonable values based upon known concentrations of lactose in these products. Any amount over this was assigned as '*added sugars*'.

Product categorisation

Products were categorised in two ways:

- To one of 411 categories within the FoodSwitch India database.
- To one of 19 categories within the Euromonitor International food and beverage categorisation system. Euromonitor International is a privately-owned market research firm providing data and

analysis on total market sizes, market shares and trends in a range of industries, including food. This categorisation was made to enable the nutrition analysis to be combined with sales data.

Groupings of Euromonitor International categories and sub-categories – hereafter called ‘EMI subsets’ - were made to generate subsets of products of sufficient size to allow nutritional analysis of comparable food products. Of note, results for milk drinks are presented as ‘foods’ not ‘drinks’ according to Euromonitor International’s method of classification but were considered beverages when calculating their nutrient profile scores. Also of note is that higher-level categories have been used in the 2020 *Product Profile* compared to the 2016 *Product Profile*. This was to ensure that the 2020 India *Product Profile* utilised the same classification system as ATNI’s 2018 *Global Product Profile*. EMI subset definitions have changed over time, and so for the purposes of this analysis, food and beverage products from 2016 were reclassified where necessary to those used in the 2020 India *Product Profile*. Key changes between the classification of foods in the 2016 and 2020 Product Profiles can be seen in Appendix A.

Table 3 EMI subsets

Food categories	Beverage categories
Baked goods	Bottled water
Breakfast cereals	Carbonates
Confectionery	Concentrates
Dairy	Juice
Edible oils	Other hot drinks
Ice cream and frozen desserts	
Processed fruit and vegetables	
Ready meals	
Rice, pasta and noodles	
Sauces, dressings and condiments	
Savoury snacks	
Soup	
Sweet biscuits, snack bars and fruit snacks	
Sweet spreads	

Definitions for EMI subsets can be found on ATNI's website

Application of imputed data in the nutrient profiling models

The HSR applied with the following use of proxy information from imputed values:

- For the purposes of generating a Health Star Rating, proxy values were used for saturated fat, sugar, fibre and sodium, but *only* if the product label was not missing energy nor missing three or more of four key nutrients (saturated fat, sugar, sodium, protein) required for the analysis. If three or more of these nutrients were missing, then the product was excluded from the analysis. Products were not included in analysis if energy content was missing. Plain packaged water (whether still or carbonated) was assigned a Health Star Rating of 5.0 consistent with the HSR Guidelines.⁹

These decisions were a pragmatic compromise between enabling analysis of the majority of identified products versus basing analysis on mostly proxy data. Table 4 outlines the sources of nutrient information used in generating nutrient profile scores.

⁹ Australian Government, Health Star Rating System 'Guide for Industry', available at <http://healthstarrating.gov.au/internet/healthstarrating/publishing.nsf/Content/guide-for-industry-document> (accessed 11 November 2016)

Sales data

Sales data were obtained at the Euromonitor subset level for each company. This was used to generate sales-weighted outcomes for analyses.

As ATNI held the licence for the Euromonitor International data, ATNI did the analyses and provided The George Institute with results. ATNI accepts full responsibility for these components of the report.

The data were analysed using STATA statistical software version 15.1.

RESULTS

Products included

There were 821 identified products manufactured by the 11 included companies in 2016 and 1,288 in 2019.

Table 4 Number of food products by company in EMI subsets

EMI Subset	Amul GCMMF		Britannia Industries		Coca- Cola India		Hindustan Unilever		ITC		KMF Nandini		Mondelez India		Mother Dairy		Nestlé India		Parle Products		PepsiCo India		Total	
	2016	2019	2016	2019	2016	2019	2016	2019	2016	2019	2016	2019	2016	2019	2016	2019	2016	2019	2016	2019	2016	2019	2016	2019
Baked goods	-	-	19	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	29
Breakfast cereals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	5	14	5
Confectionery	3	17	-	-	-	-	-	-	4	19	-	-	29	74	-	-	13	28	12	26	-	-	61	164
Dairy	42	98	14	34	3	2	-	-	-	-	23	33	-	-	41	56	17	15	-	-	-	-	140	238
Edible oils	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	6	-	-	-	-	-	-	3	6
Ice cream and frozen desserts	39	58	-	-	-	-	34	65	-	-	26	29	-	-	54	30	-	-	-	-	-	-	153	182
Processed fruit and vegetables	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	7	-	-	-	-	-	-	3	7
Ready meals	-	-	-	-	-	-	-	-	17	26	-	-	-	-	-	-	-	-	-	-	-	-	17	26
Rice, pasta and noodles	-	-	-	-	-	-	-	-	8	21	-	-	-	-	-	-	7	16	-	-	-	-	15	37
Sauces, dressings and condiments	-	-	-	-	-	-	25	19	-	-	-	-	-	-	-	-	10	9	-	-	-	-	35	28
Savoury snacks	-	-	8	8	-	-	-	-	22	44	-	-	-	-	-	-	-	-	19	59	92	37	141	148
Soup	-	-	-	-	-	-	19	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	23
Sweet biscuits, snack bars and fruit snacks	-	-	46	65	-	-	-	-	29	73	-	-	7	10	-	-	-	-	44	116	-	-	126	264
Sweet spreads	-	-	-	-	-	-	7	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	7
Total	84	173	87	136	3	2	85	114	80	183	49	62	36	84	101	99	47	68	75	201	106	42	753	1164

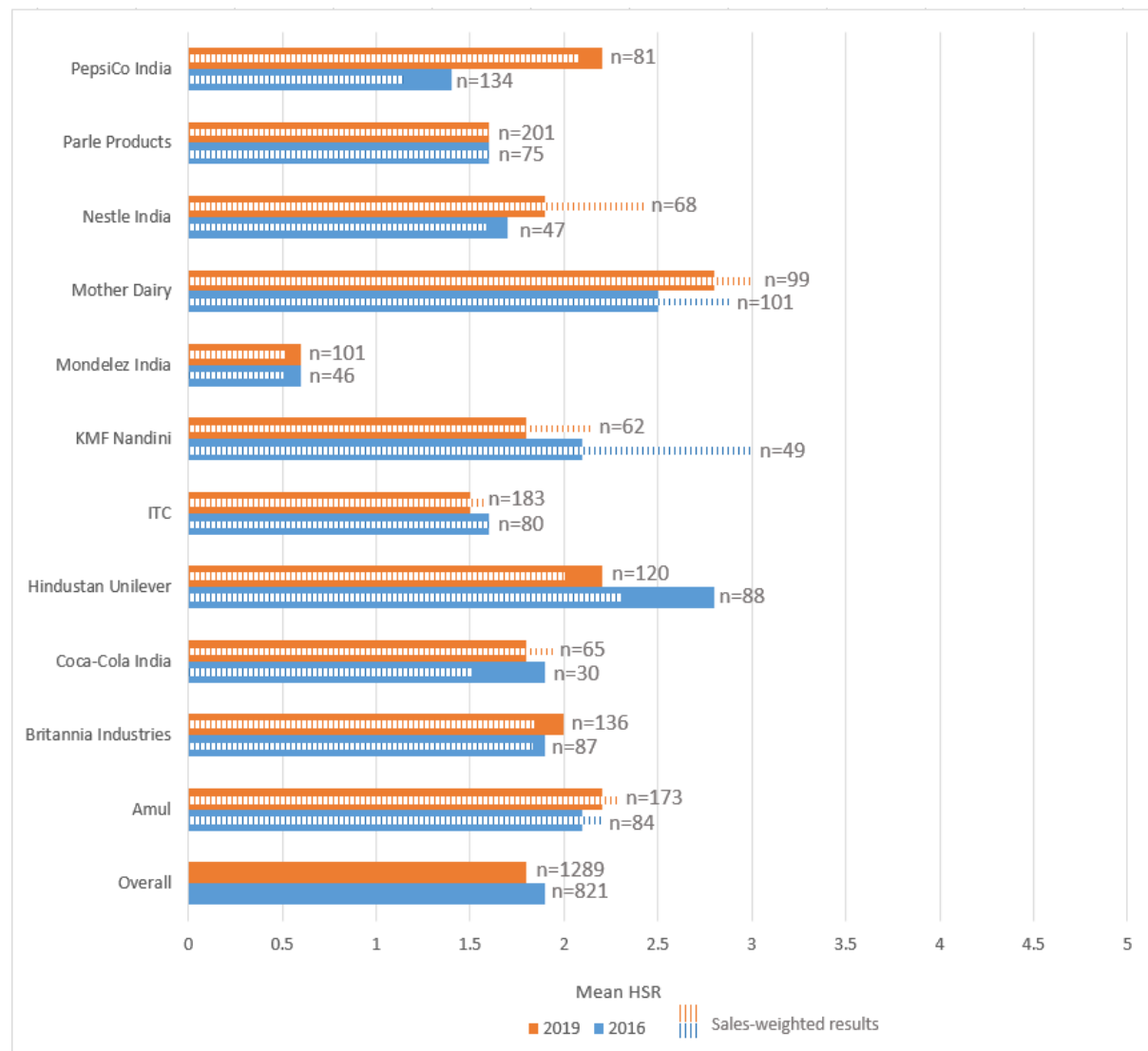
Table 5 Number of beverage products by company in Euromonitor subsets

Euromonitor Subset	Coca-Cola India		Hindustan Unilever		Mondelez India		PepsiCo India		Total	
	2016	2019	2016	2019	2016	2019	2016	2019	2016	2019
Bottled water	2	5	-	-	-	-	1	3	3	8
Carbonates	17	27	-	-	-	-	8	17	25	44
Concentrates	-	-	3	6	5	4	-	-	8	10
Juice	8	30	-	-	-	-	19	19	27	49
Other hot drinks	-	-	-	-	5	13	-	-	5	13
Total	27	62	3	6	10	17	28	39	68	124

In 2016, *Ice cream and frozen desserts* had the largest number of products included in analysis (n=153), and in 2019 *Sweet biscuits, snack bars and fruit snacks* the largest (n=264). *Edible oils* was the category with the smallest number of products in both years (n=3 in 2016 and n=6 in 2019).

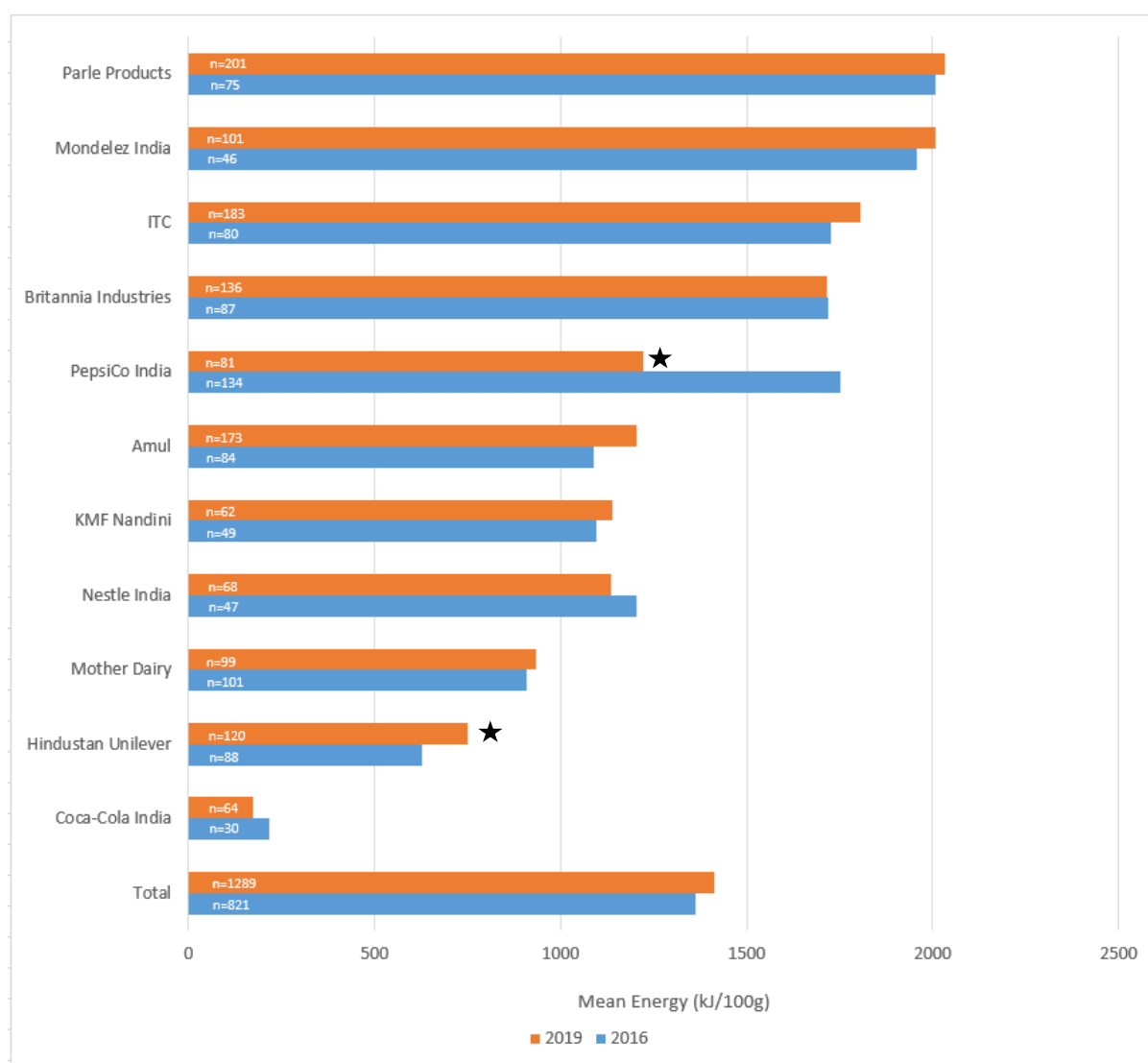
ANALYSIS 1 and 2 Changes in mean nutrient profile of products and sales-weighted nutrient profile of products between 2016 and 2019

Figure 1 Mean Health Star Rating and sales-weighted mean Health Star Rating by company in 2016 versus 2019 – overall product portfolio



Before sales-weighting was applied, Hindustan Unilever had the highest mean HSR in 2016 (2.8), and in 2019 Mother Dairy had the highest mean HSR (2.8). When sales-weighting was applied, in 2016 KMF Nandini had the highest mean HSR (3.0) and Mother Dairy remained the highest in 2019 with a sales-weighted mean HSR of 3.0. PepsiCo India showed the greatest improvement in overall sales-weighted mean HSR, increasing from 1.2 in 2016 to 2.1 in 2019. Nestle India also showed a large increase from 1.6 in 2016 to 2.4 in 2019. Two companies had a decrease in sales-weighted mean HSR between 2016 and 2019. KMF Nandini went from a mean HSR of 3.0 in 2016 to a mean HSR of 2.2 in 2019. Similarly, Hindustan Unilever went from a mean HSR of 2.3 in 2016 to 2.0 in 2019. Despite these decreases, KMF Nandini and Hindustan Unilever still had mean HSRs that were higher than the overall mean HSR for all companies combined (1.8 in 2019).

Figure 2 Changes in mean levels of energy (kJ/100g) between 2016 and 2019 by company overall

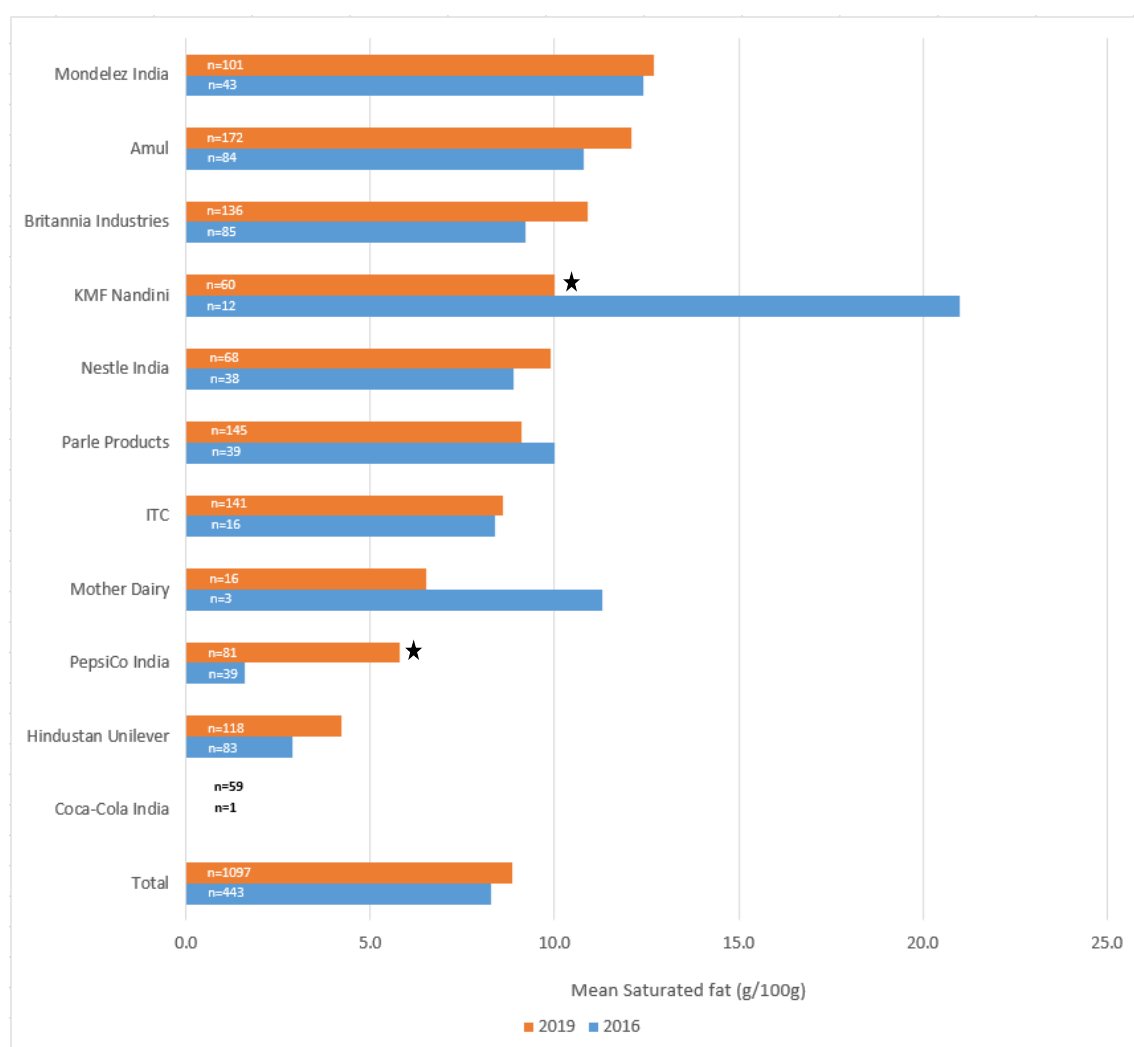


In both 2016 and 2019, Parle Products' portfolio had the highest mean energy content (kJ/100g) out of the 11 companies included in analysis (2008kJ/100g in 2016 and 2032kJ/100g in 2019). Mondelez India was a close second highest, with 1956kJ/100g in 2016 and 2008kJ/100g in 2019. Coca-Cola India had the lowest mean energy content in both years due to its portfolio being dominated by beverages (which generally score lower in energy content due to the volume of water present). Only one company showed a significant decrease in energy content between 2016 and 2019 (PepsiCo India) driven by decreases in the *Juice* category (see [here](#) for further details). One company (Hindustan Unilever) showed a significant increase in energy content between 2016 and 2019, driven by a significant increase in the mean energy content of their *Ice cream and frozen desserts* products (see [here](#) for further details).

Table 6 Proportion of products from each company that were missing saturated fat values in 2016 and 2019

Manufacturer	2016		2019	
	No. products	% total products missing saturated fat values	No. products	% total products missing saturated fat values
Amul GCMMF	0	0.0%	1	0.6%
Britannia Industries	2	2.3%	0	0.0%
Coca-Cola India	29	96.7%	6	9.4%
Hindustan Unilever	5	5.7%	2	1.7%
ITC	64	80.0%	42	23.0%
KMF Nandini	37	75.5%	2	3.2%
Mondelez India	3	6.5%	0	0.0%
Mother Dairy	98	97.0%	83	83.8%
Nestle India	9	19.1%	0	0.0%
Parle Products	36	48.0%	56	27.9%
PepsiCo India	95	70.9%	0	0.0%
Total	378	46.0%	192	14.9%

Figure 3 Changes in mean levels of saturated fat (g/100g) between 2016 and 2019 by company overall



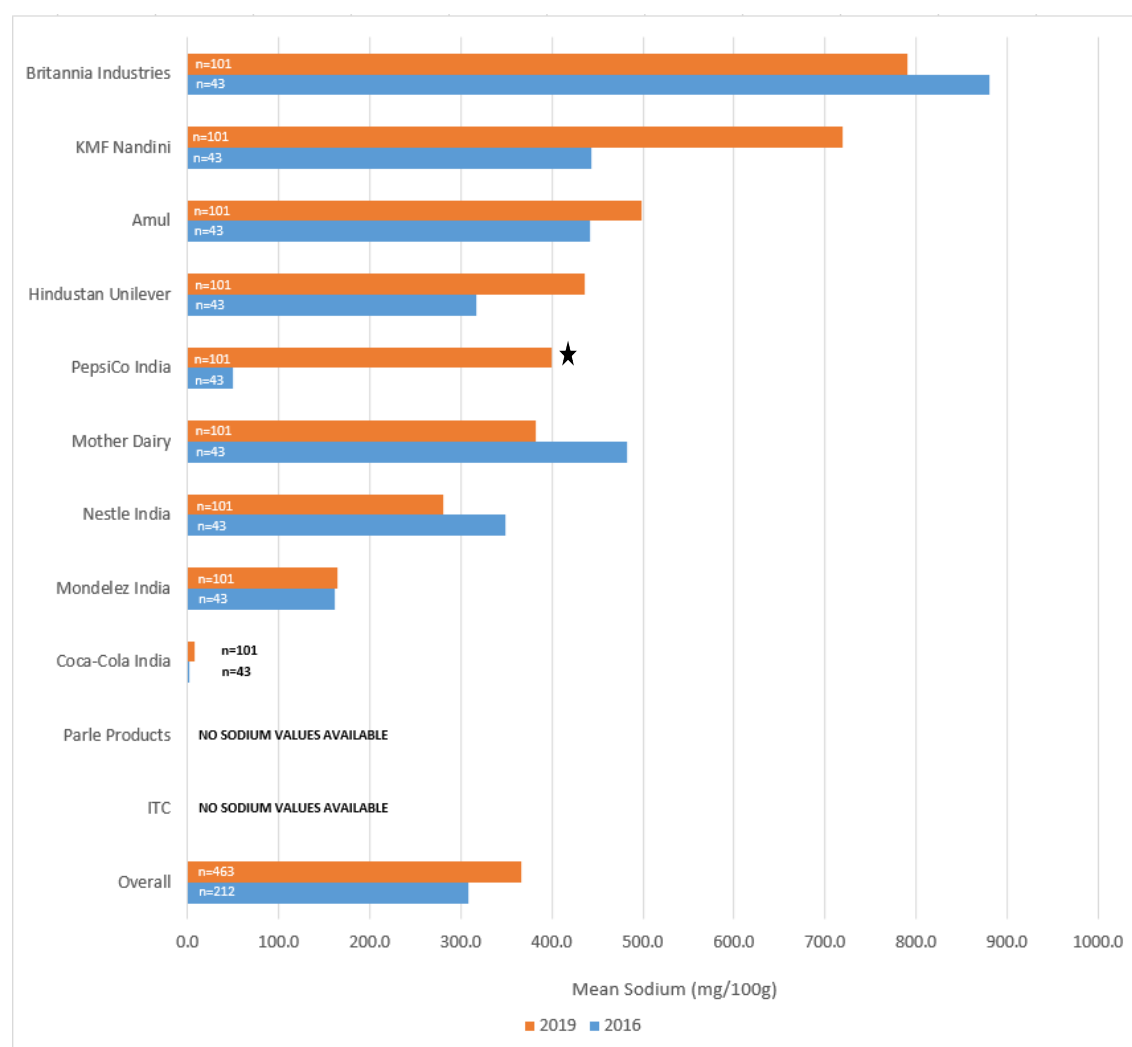
In 2016, KMF Nandini had the highest mean level of saturated fat (21.0g/100g), however mean saturated fat decreased significantly between 2016 and 2019 to 10.0g/100g ($p=0.01$) due to a mean decrease in the saturated fat content of their *Dairy* products (see further details [here](#)). In 2019, Mondelez India had the highest mean saturated fat with 12.7g/100g, followed by Amul with 12.1g/100g). Only one company (PepsiCo India) showed a significant increase in saturated fat content between 2016 and 2019.

It is important to note that there was a large change in the proportion of companies that reported saturated fat on product labels between 2016 and 2019, which may have affected results. Table 6 shows that 46% of all products in 2016 did not report saturated fat content on the label, yet this had dropped to only 15% in 2019. This may explain the large significant decrease in mean saturated fat content for KMF Nandini, who was missing saturated fat values for 76% of its product range in 2016, but only 3% in 2019. In 2016, only one company (Amul) had zero products missing saturated fat values. However, in 2019 a large improvement was seen in terms of labelling of saturated fat values, with four companies (Britannia Industries, Mondelez India, Nestle India and PepsiCo India) having 100% of their products labelling saturated fat values and the majority of remaining companies still showing an increase in the proportion of their product range reporting saturated fat values (Table 6).

Table 7 Proportion of products from each company missing sodium values in 2016 and 2019

Manufacturer	2016		2019	
	No. products	% total products missing sodium values	No. products	% total products missing sodium values
Amul GCMF	64	76.2%	124	71.7%
Britannia Industries	73	83.9%	109	80.1%
Coca-Cola India	25	83.3%	53	82.8%
Hindustan Unilever	13	14.8%	0	0.0%
ITC	80	100.0%	183	100.0%
KMF Nandini	47	95.9%	59	95.2%
Mondelez India	3	6.5%	1	1.0%
Mother Dairy	98	97.0%	96	97.0%
Nestle India	17	36.2%	0	0.0%
Parle Products	75	100.0%	201	100.0%
PepsiCo India	113	84.3%	0	0.0%
Total	608	74.1%	826	64.1%

Figure 4 Changes in mean levels of sodium (mg/100g) between 2016 and 2019 by company overall



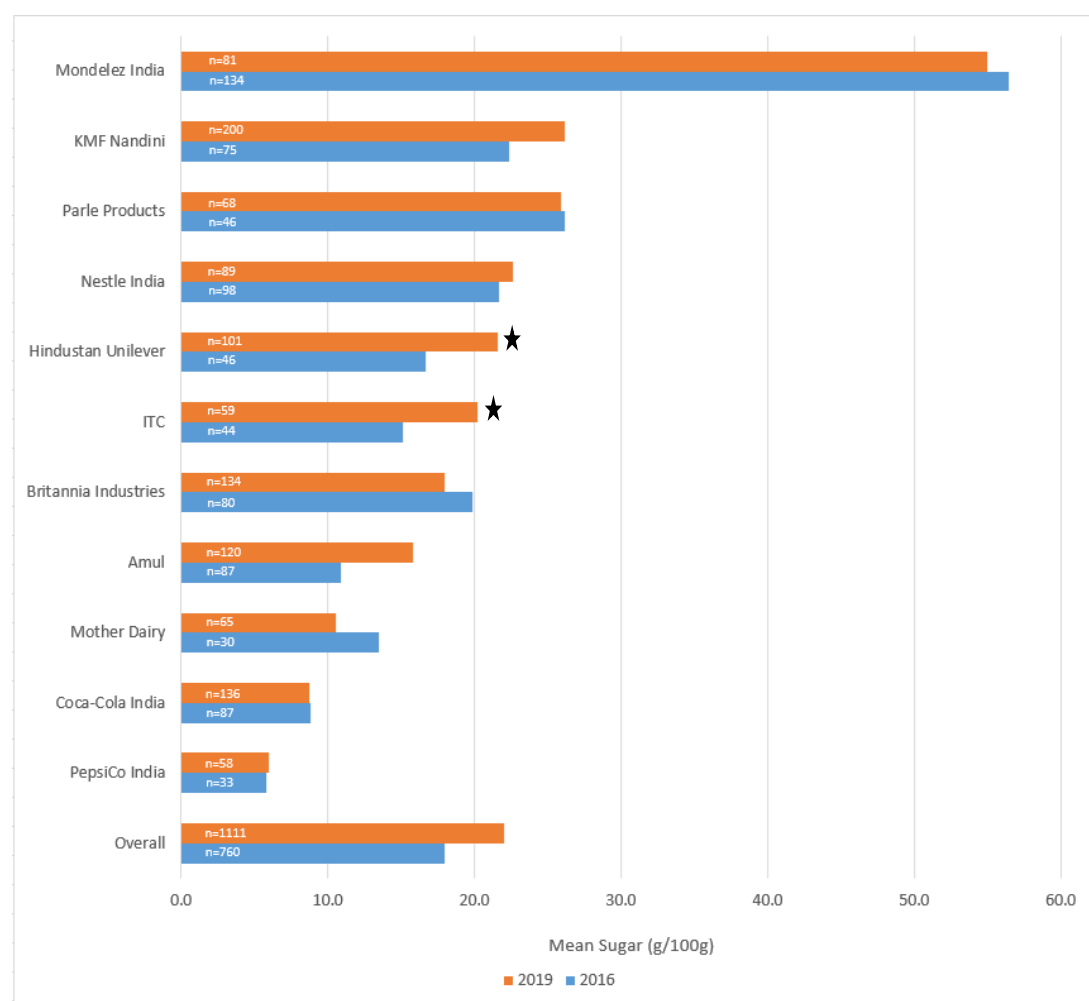
In both 2016 and 2019, Britannia Industries had the highest mean level of sodium (881mg/100g in 2016 and 791mg/100g in 2019). Coca-Cola India had the lowest mean sodium content in both years (2mg/100g in 2016 and 8mg/100g in 2019) due to its portfolio made up primarily of beverage products. PepsiCo India was the only company to show a significant increase in sodium between 2016 and 2019 (50mg/100g to 400mg/100g; $p=0.0004$), however this could easily be due to PepsiCo reporting sodium levels on less than 20% of their product portfolio in 2016, yet reporting values for 100% of products in 2019 (Table 7).

There was a slight decrease overall in the proportion of products that had missing sodium values between 2016 (74% missing) and 2019 (64% missing) however sodium was still the nutrient with the most missing values on products from these 11 manufacturers. In 2016, no companies had 100% of their products labelling sodium values. However, in 2019 there was a slight improvement, with three companies (Hindustan Unilever, Nestle India and PepsiCo India) having 100% of their products labelling sodium values and the majority of remaining companies still showing an increase in the proportion of their product range reporting sodium values (Table 7).

Table 8 Proportion of products from each company missing total sugar values in 2016 and 2019

Manufacturer	2016		2019	
	No. products missing sugar values	% total products missing sugar values	No. products missing sugar values	% total products missing sugar values
Amul GCMF	51	60.7%	115	66.5%
Britannia Industries	0	0.0%	0	0.0%
Coca-Cola India	0	0.0%	0	0.0%
Hindustan Unilever	1	1.1%	0	0.0%
ITC	0	0.0%	49	26.8%
KMF Nandini	5	10.2%	3	4.8%
Mondelez India	0	0.0%	0	0.0%
Mother Dairy	3	3.0%	10	10.1%
Nestle India	1	2.1%	0	0.0%
Parle Products	0	0.0%	1	0.5%
PepsiCo India	0	0.0%	0	0.0%
Total	61	7.4%	178	13.8%

Figure 5 Changes in mean levels of total sugars (g/100g) between 2016 and 2019 by company overall



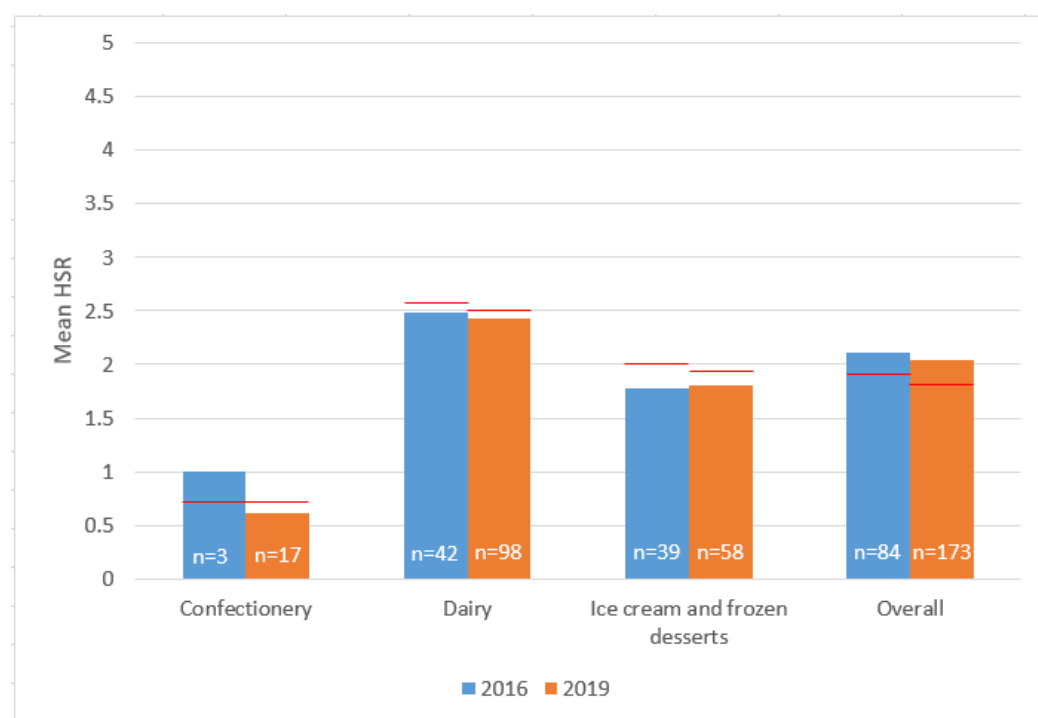
In both 2016 and 2019, Mondelez India had the highest mean level of total sugars (56.4g/100g in 2016 and 55.0g/100g in 2019). PepsiCo India had the lowest mean total sugar content in both years (5.8g/100g in 2016 and 6.0g/100g in 2019) due to its portfolio made up primarily of beverage products and savoury snacks. Hindustan Unilever and ITC were the only companies to have a significant increase in total sugar content between 2016 and 2019. ITC's change could in part be due to an increase in the proportion of products that had missing total sugar values in 2019 (Table 8).

There was an increase in the proportion of products that had missing total sugar values between 2016 (7% missing) and 2019 (14% missing) however total sugar had the lowest proportion of missing values than when compared to sodium and saturated fat. In both 2016 and 2019, six of the 11 companies had 100% of products reporting the total sugar content. Amul was the company with the lowest proportion of products displaying total sugar values (39% in 2016 and 33% in 2019).

ANALYSIS 4 Individual company results

AMUL

Figure 6 Changes in mean HSR by category for Amul; 2016-2019



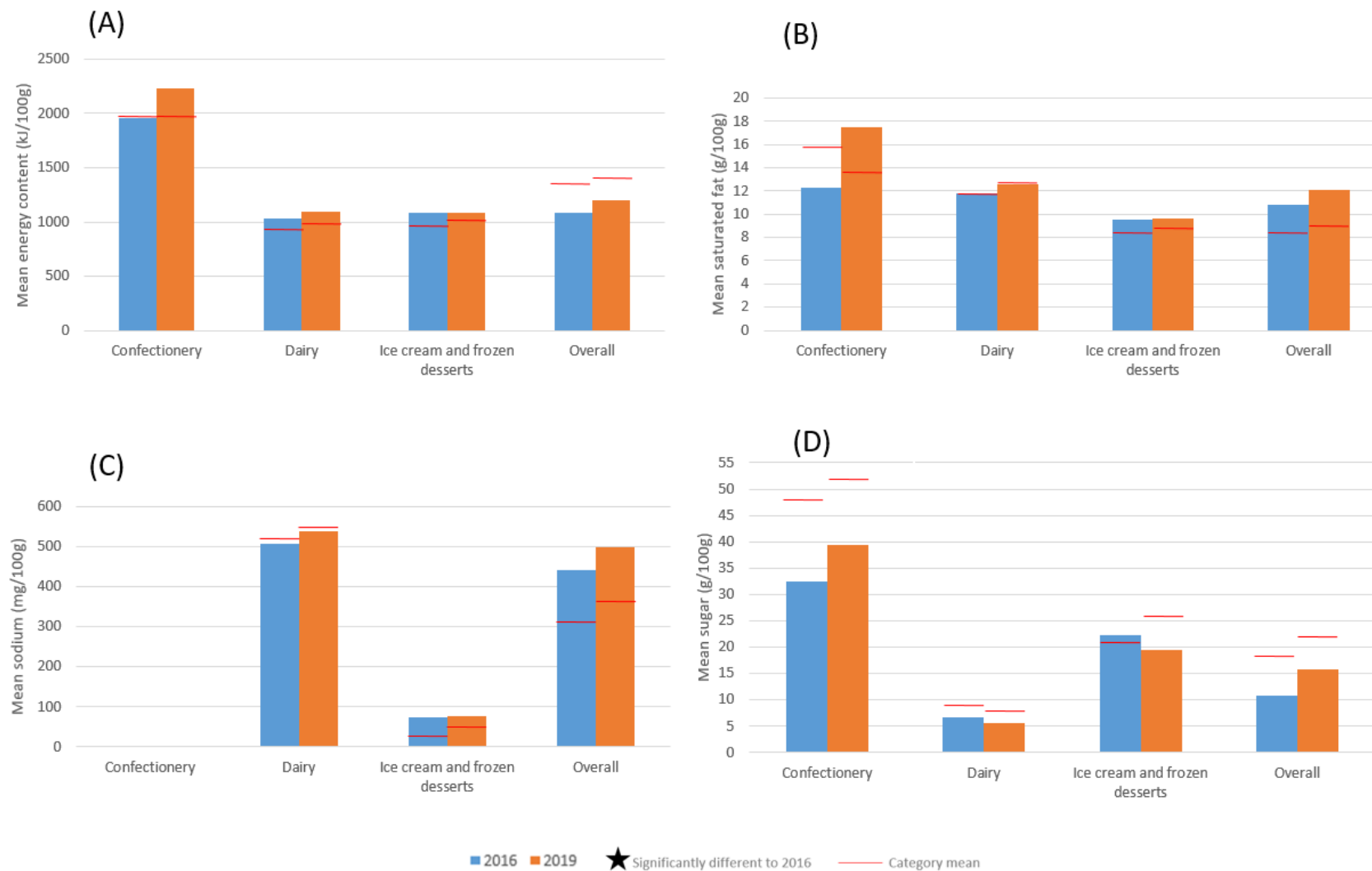
The overall mean HSR for Amul decreased slightly between 2016 and 2019 from 2.1 to 2.0. The *Confectionery* category and *Dairy* category also showed a slight decrease, however none of the changes were significant. Importantly, although almost all of Amul products in both 2016 and 2019 had saturated fat values available on the package, sodium and total sugar content were missing for the majority of products (Table 9), and so proxy values for these nutrients were required to calculate the HSR for many of Amul's products, particularly products in the *Ice cream and frozen desserts* category.

Table 9 Amul products missing nutrient values in 2016 and 2019, by EMI subset

N (%) missing nutrient values		Confectionery	Dairy	Ice cream and frozen desserts	Overall
		2016 n=3 2019 n=17	2016 n=42 2019 n=98	2016 n=39 2019 n=58	2016 n=84 2019 n=173
Saturated fat	2016	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	2019	0 (0%)	1 (2%)	0 (0%)	1 (1%)
Sodium	2016	3 (100%)	25 (60%)	36 (92%)	64 (76%)
	2019	17 (100%)	53 (54%)	54 (93%)	124 (72%)
Sugar	2016	0 (0%)	16 (38%)	35 (90%)	51 (61%)
	2019	5 (29%)	65 (66%)	45 (78%)	115 (66%)

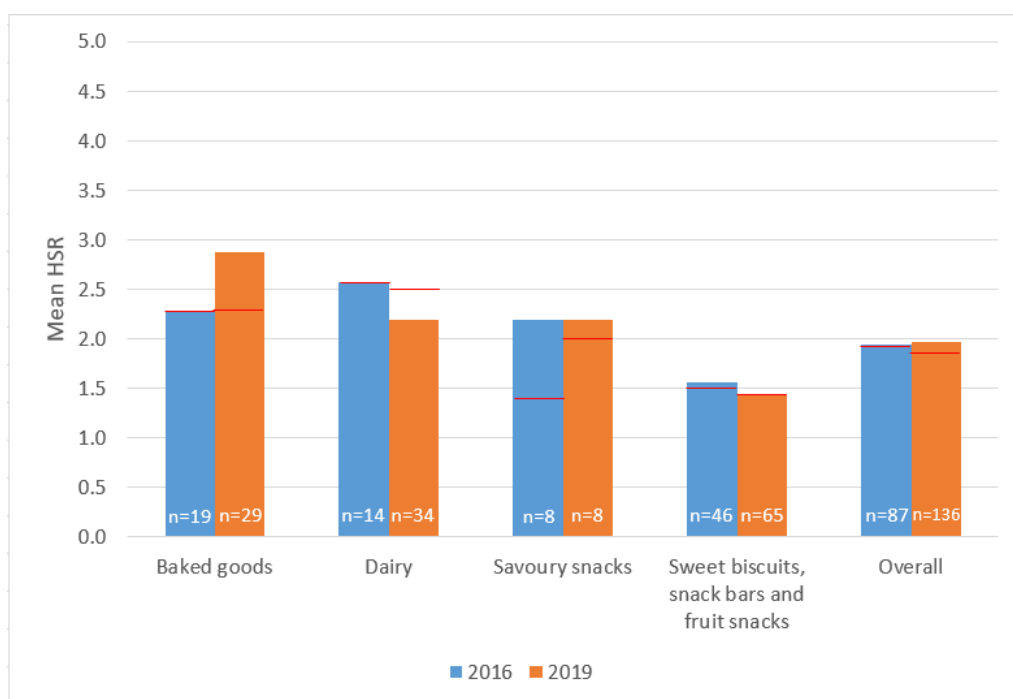
The overall mean energy, saturated fat, sodium and total sugar content of Amul products increased slightly between 2016 and 2019 (Figure 7), however none of the changes were significant. Mean sugar content for Amul's *Confectionery* and *Dairy* products were lower than the category average, however it is important to note that more than 60% of Amul's products did not have total sugar content available on product labels (Table 6). Zero of Amul's *Confectionery* products provided the sodium content on the label and so changes between 2016 and 2019 could not be evaluated for this category.

Figure 7 Changes in mean nutrient levels for Amul; 2016-2019 – (A) Mean energy content (B) Mean saturated fat content (C) Mean sodium content (D) Mean total sugar content



BRITANNIA INDUSTRIES

Figure 8 Changes in mean HSR by category for Britannia Industries; 2016-2019



The mean healthiness of Britannia Industries' product portfolio did not change significantly between 2016 and 2019 (Figure 8). There was a slight increase observed in *Baked goods* (2.3 to 2.9) and a slight decrease in *Dairy* (2.6 to 2.2) however none of the changes were significant. Importantly, although almost all of Britannia Industries' products in both 2016 and 2019 had saturated fat and total sugar values available on the package, sodium content was missing for the majority of products (Table 10), and so proxy values were required to calculate the HSR for many products in the *Baked goods*, *Dairy* and *Sweet biscuits, snack bars and fruit snacks* categories.

Table 10 Britannia Industries products missing nutrient values in 2016 and 2019, by EMI subset

N (%) missing nutrient values		Baked goods	Dairy	Savoury snacks	Sweet biscuits, snack bars and fruit snacks	Overall
		2016 n=19 2019 n=29	2016 n=14 2019 n=34	2016 n=8 2019 n=8	2016 n=46 2019 n=65	2016 n=87 2019 n=136
Saturated fat	2016	0 (0%)	0 (0%)	0 (0%)	2 (4%)	2 (2%)
	2019	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Sodium	2016	19 (100%)	0 (0%)	8 (100%)	46 (100%)	73 (84%)
	2019	29 (100%)	7 (21%)	8 (100%)	65 (100%)	109 (80%)
Sugar	2016	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	2019	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

The overall levels of energy, saturated fat, sodium and total sugar did not change significantly between 2016 and 2019 for Britannia Industries. However, a small but significant increase in energy content was seen in the *Sweet biscuits, snack bars and fruit snacks* category ($p=0.0466$). As seen in Figure 9C, three categories did not have data for sodium and so changes could not be evaluated for these categories. Of concern is that Britannia Industries does not provide sodium values on the label for products that would likely contain higher levels of sodium than other categories, such as *Savoury snacks* and *Baked goods*.

Figure 9 Changes in mean nutrient levels for Britannia Industries; 2016-2019 – (A) Mean energy content (B) Mean saturated fat content (C) Mean sodium content (D) Mean total sugar content

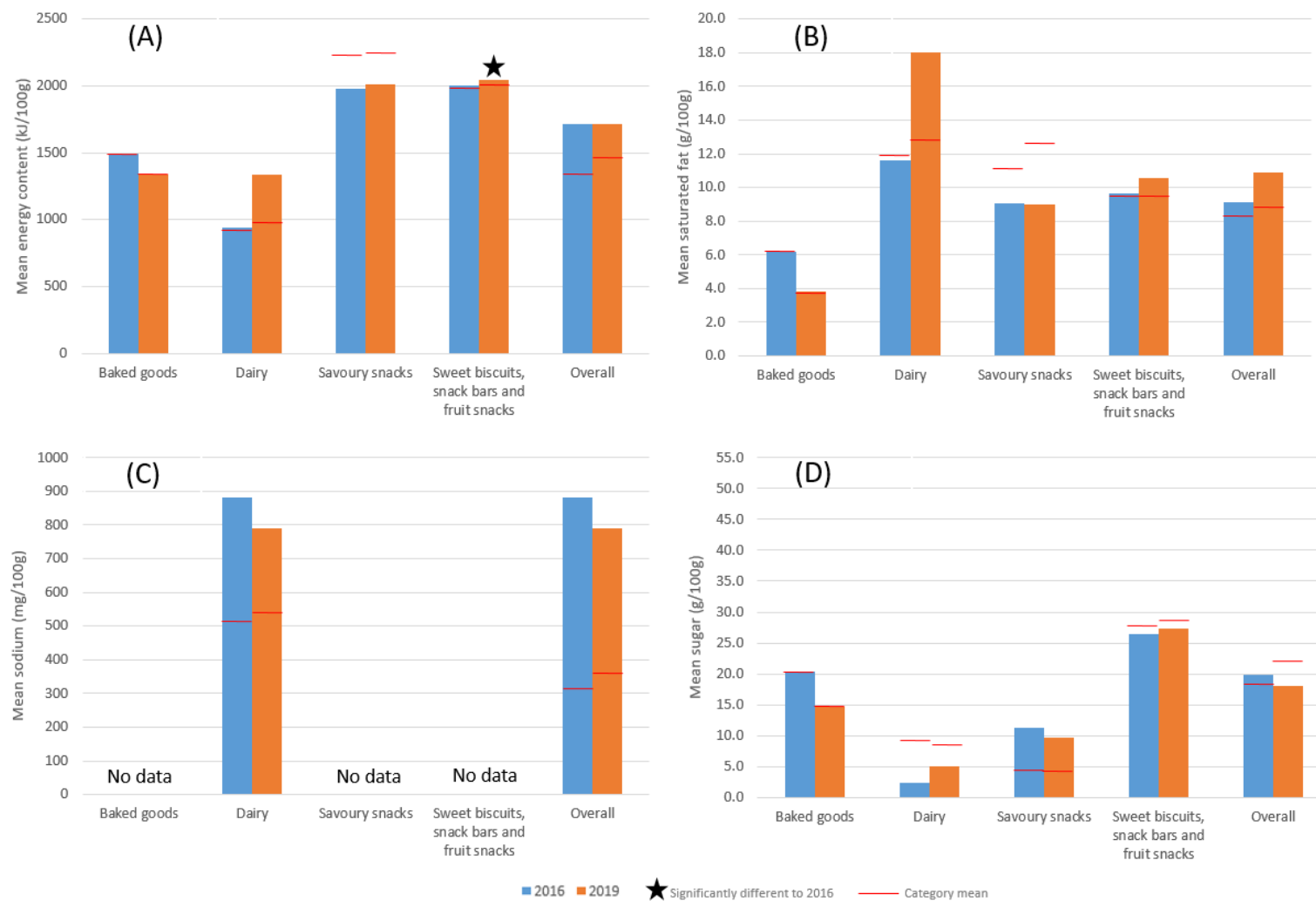
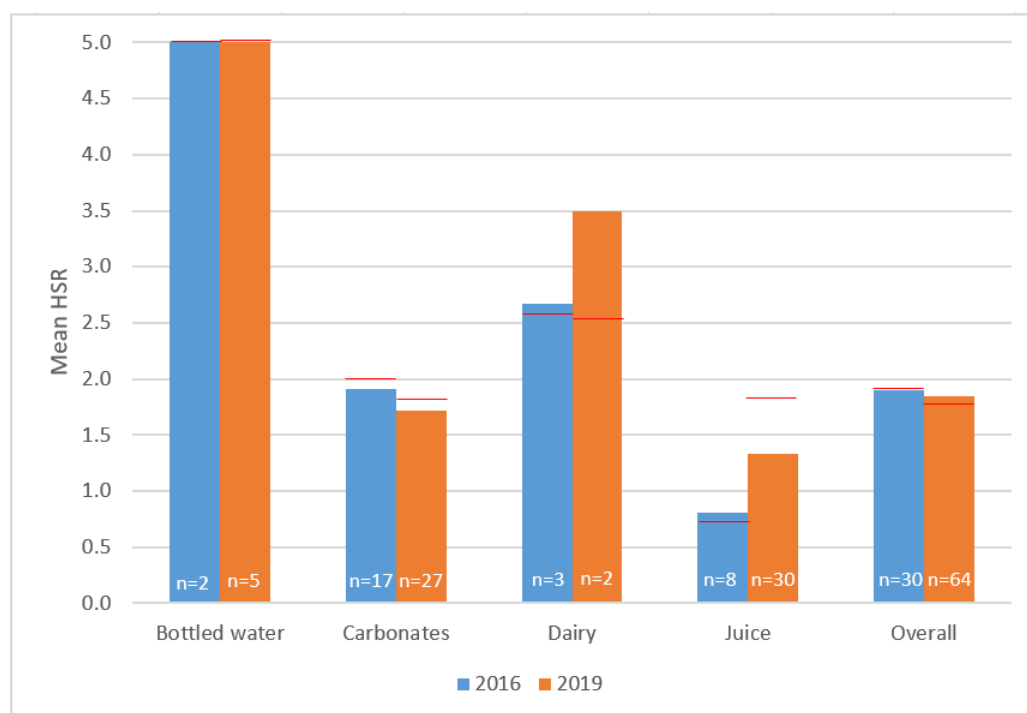


Figure 10 Changes in mean HSR by category for Coca-Cola India; 2016-2019

Overall healthiness for Coca-Cola India was low, at 1.9 in both 2016 and 2019. The mean healthiness of Coca-Cola India's product portfolio did not change significantly between 2016 and 2019 (Figure 10). There was an increase observed in *Dairy* (2.7 to 3.5) and *Juice* (0.8 to 1.3) however none of the changes were significant. Interestingly, 100% of Coca-Cola's products in both 2016 and 2019 reported total sugar values on the package, yet sodium content was missing for the majority of products (Table 11). A positive finding was that in 2016 almost 100% of products did not report saturated fat values on product packaging but by 2019 more than 90% of products *did* report saturated fat.

Table 11 Coca-Cola India products missing nutrient values in 2016 and 2019, by EMI subset

N (%) missing nutrient values		Bottled water 2016 n=2 2019 n=5	Carbonates 2016 n=17 2019 n=27	Dairy 2016 n=3 2019 n=2	Juice 2016 n=8 2019 n=30	Overall 2016 n=30 2019 n=64
Saturated fat	2016	2 (100%)	16 (94%)	3 (100%)	8 (100%)	29 (97%)
	2019	0 (0%)	0 (0%)	2 (100%)	4 (13%)	6 (9%)
Sodium	2016	0 (0%)	14 (82%)	3 (100%)	8 (100%)	25 (83%)
	2019	1 (20%)	21 (78%)	2 (100%)	29 (97%)	53 (83%)
Sugar	2016	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	2019	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

The overall levels of energy, saturated fat, sodium and total sugar did not change significantly between 2016 and 2019 for Coca-Cola India. As seen in Figure 11B and 11C, two categories (*Dairy* and *Juice*) did not have data for either saturated fat or sodium and so changes could not be evaluated for these categories. Of concern is that saturated fat was not reported for *Dairy* products, with *Dairy* being a category where saturated fat may be a concern for consumers.

Figure 11 Changes in mean nutrient levels for Coca-Cola India; 2016-2019 – (A) Mean energy content (B) Mean saturated fat content (C) Mean sodium content (D) Mean total sugar content

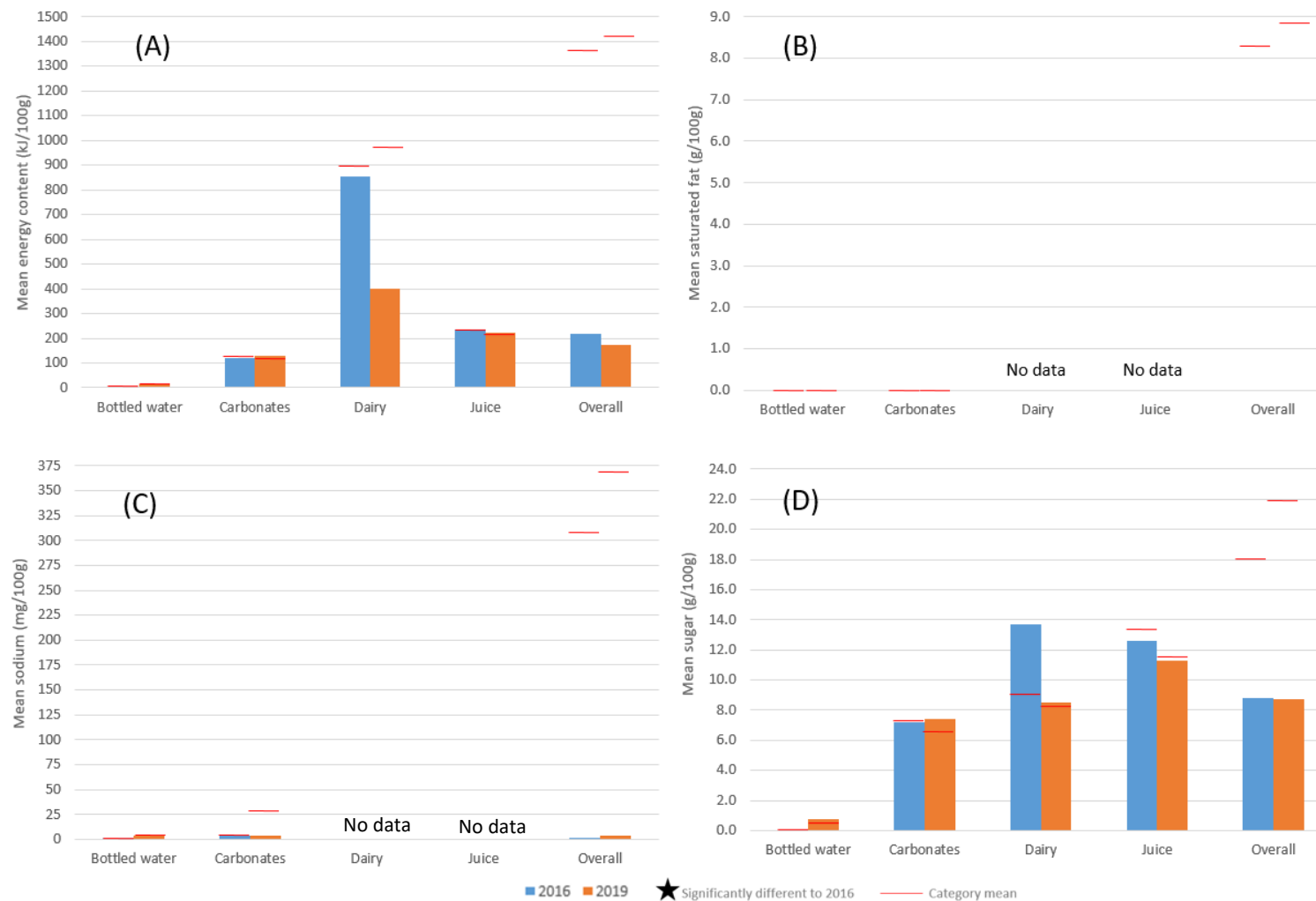
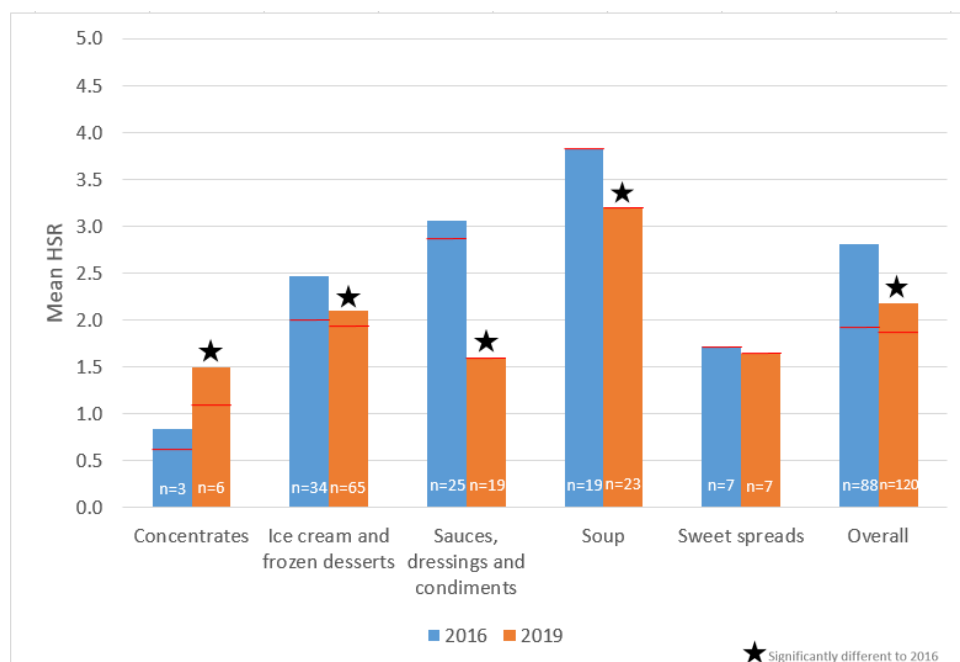


Figure 12 Changes in mean HSR by category for Hindustan Unilever; 2016-2019

Hindustan Unilever showed a significant decrease in mean HSR between 2016 and 2019 (2.8 to 2.2; $p < 0.0001$), based on the assessment of 88 products in 2016 and 120 in 2020. This was due to a decrease in mean HSR in *Ice cream and frozen desserts*, *Sauces dressings and condiments* and *Soup* categories (Figure 12). The mean HSR of *Concentrates* increased between 2016 and 2019. It is important to note that despite this decrease in mean HSR, Hindustan Unilever's overall healthiness was higher than the overall healthiness of all companies combined.

Table 12 Hindustan Unilever products missing nutrient values in 2016 and 2019, by EMI subset

N (%) missing nutrient values		Concentrates	Ice cream and frozen desserts	Sauces, dressings and condiments	Soup	Sweet spreads	Overall
		2016 n=3 2019 n=6	2016 n=34 2019 n=65	2016 n=25 2019 n=19	2016 n=19 2019 n=23	2016 n=7 2019 n=7	2016 n=88 2019 n=120
Saturated fat	2016	1 (33%)	0 (0%)	4 (16%)	0 (0%)	0 (0%)	5 (6%)
	2019	0 (0%)	0 (0%)	1 (5%)	0 (0%)	1 (14%)	2 (2%)
Sodium	2016	0 (0%)	13 (20%)	0 (0%)	0 (0%)	0 (0%)	13 (11%)
	2019	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Sugar	2016	0 (0%)	1 (2%)	0 (0%)	0 (0%)	0 (0%)	1 (1%)
	2019	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

Hindustan Unilever had a significant increase in overall energy content between 2016 and 2019 (626kJ/100g to 750kJ/100g; $p = 0.0452$) and total sugar content (16.7g/100g to 21.6g/100g; $p = 0.0432$). Changes appeared to be due to significant increases in the *Ice cream and frozen desserts* category and *Sauces, dressings and condiments*. Mean sodium levels in particular in the *Sauces, dressings and condiments* category increased substantially from 507mg/100g to 2196mg/100g ($p = 0.0033$). However, this appears to be due to the types of nutrient values used in each survey year, with 2016 data included for products "as prepared" and 2019 products "as sold", so was not due to a true change in nutrient content. Another important point to note is that despite increases in energy and sugar content, Hindustan Unilever's mean values in most cases were at or below the category average for all 11 companies combined.

Figure 13 Changes in mean nutrient levels for Hindustan Unilever; 2016-2019 – (A) Mean energy content (B) Mean saturated fat content (C) Mean sodium content (D) Mean total sugar content

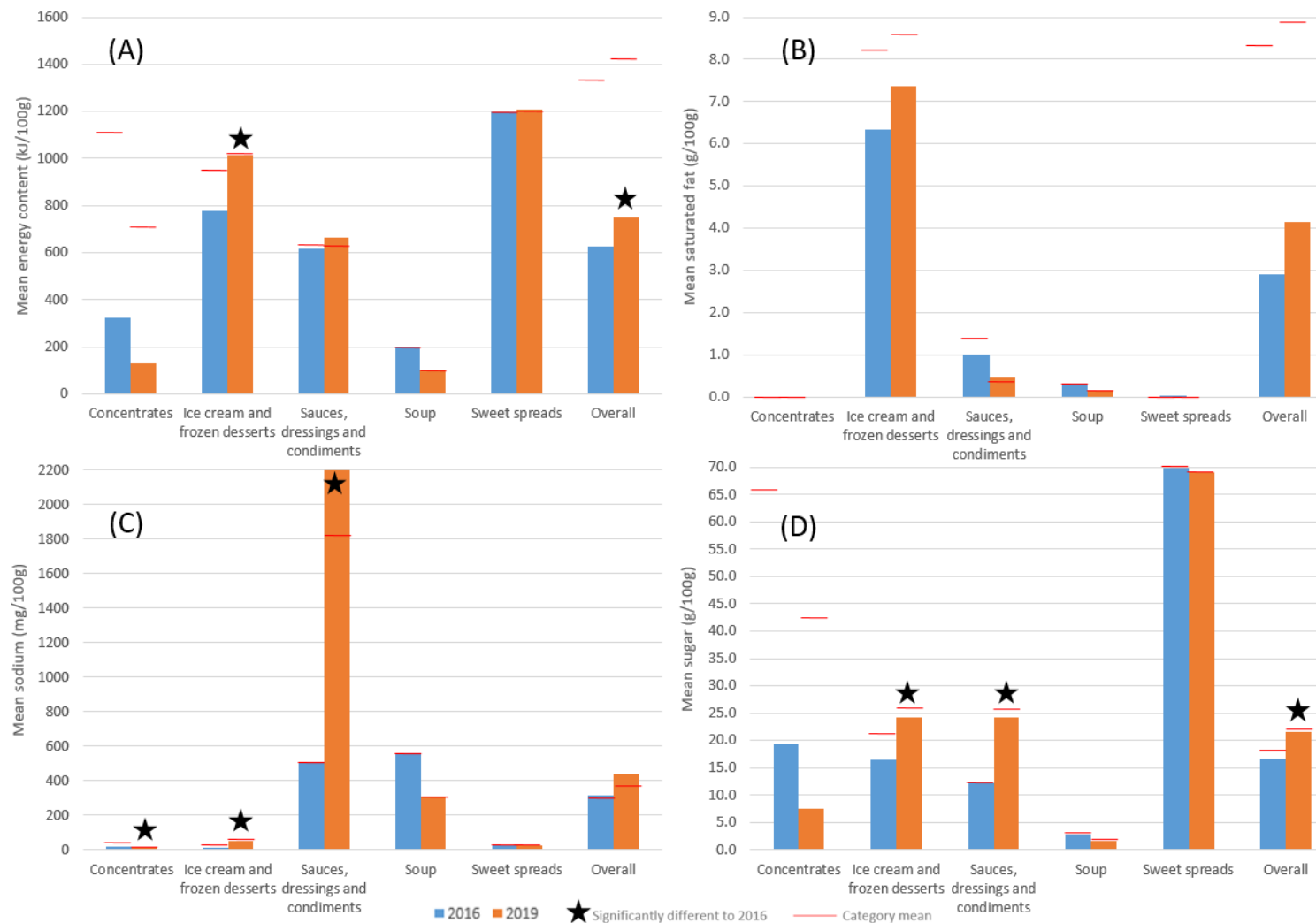
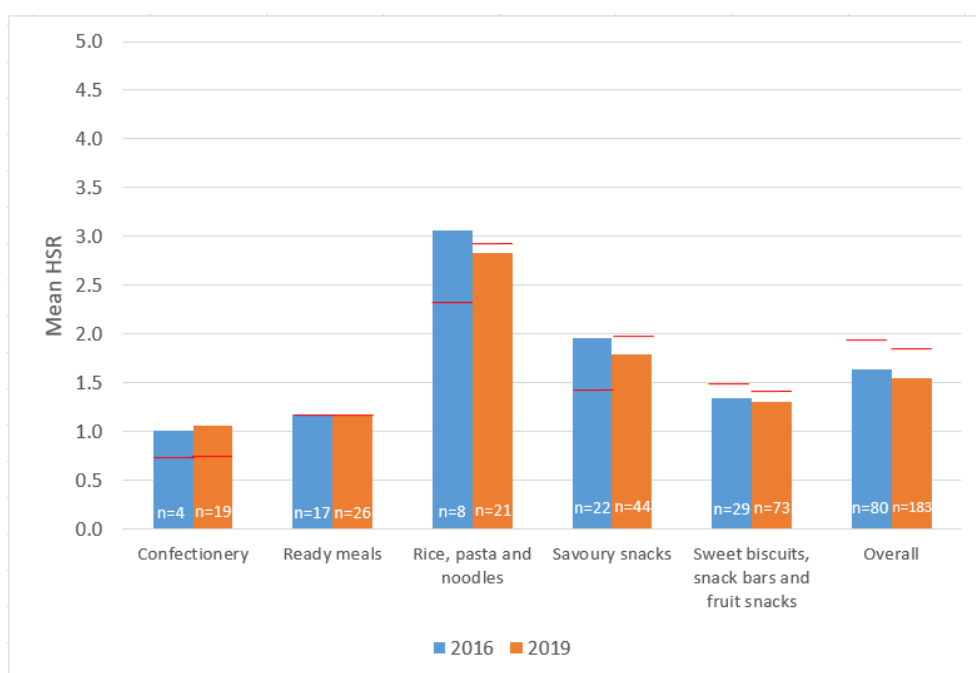


Figure 14 Changes in mean HSR by category for ITC; 2016-2019

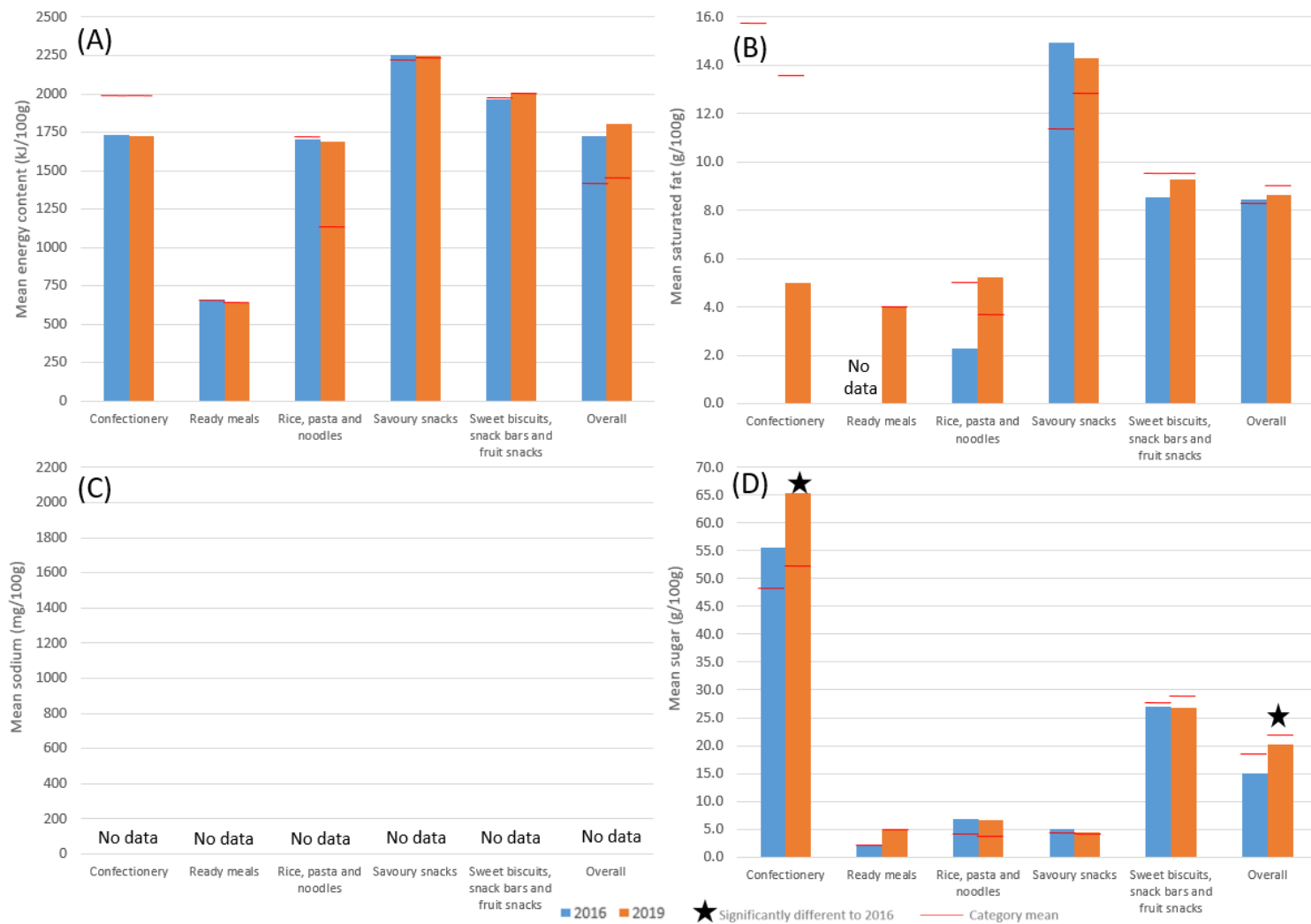
The mean healthiness of ITC products did not change substantially between 2016 and 2019, despite an increase in assessed products in 2020, resulting in an overall low mean HSR of 1.5 in 2019. No significant changes were observed for any of the individual ITC food categories (Figure 14). *Confectionery* was the category for ITC with the lowest mean HSR in both years and *Rice, pasta and noodles* the highest.

Table 13 ITC products missing nutrient values in 2016 and 2019, by EMI subset

N (%) missing nutrient values		Confectionery	Ready meals	Rice, pasta and noodles	Savoury snacks	Sweet biscuits, snack bars and fruit snacks	Overall
		2016 n=4 2019 n=19	2016 n=17 2019 n=26	2016 n=8 2019 n=21	2016 n=22 2019 n=44	2016 n=29 2019 n=73	2016 n=80 2019 n=183
Saturated fat	2016	3 (75%)	17 (100%)	5 (63%)	18 (82%)	21 (72%)	64 (80%)
	2019	4 (21%)	3 (12%)	3 (14%)	11 (25%)	21 (29%)	42 (23%)
Sodium	2016	4 (100%)	17 (100%)	8 (100%)	22 (100%)	29 (100%)	80 (100%)
	2019	19 (100%)	26 (100%)	21 (100%)	44 (100%)	73 (100%)	183 (100%)
Sugar	2016	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	2019	6 (32%)	12 (46%)	6 (29%)	9 (20%)	16 (22%)	49 (27%)

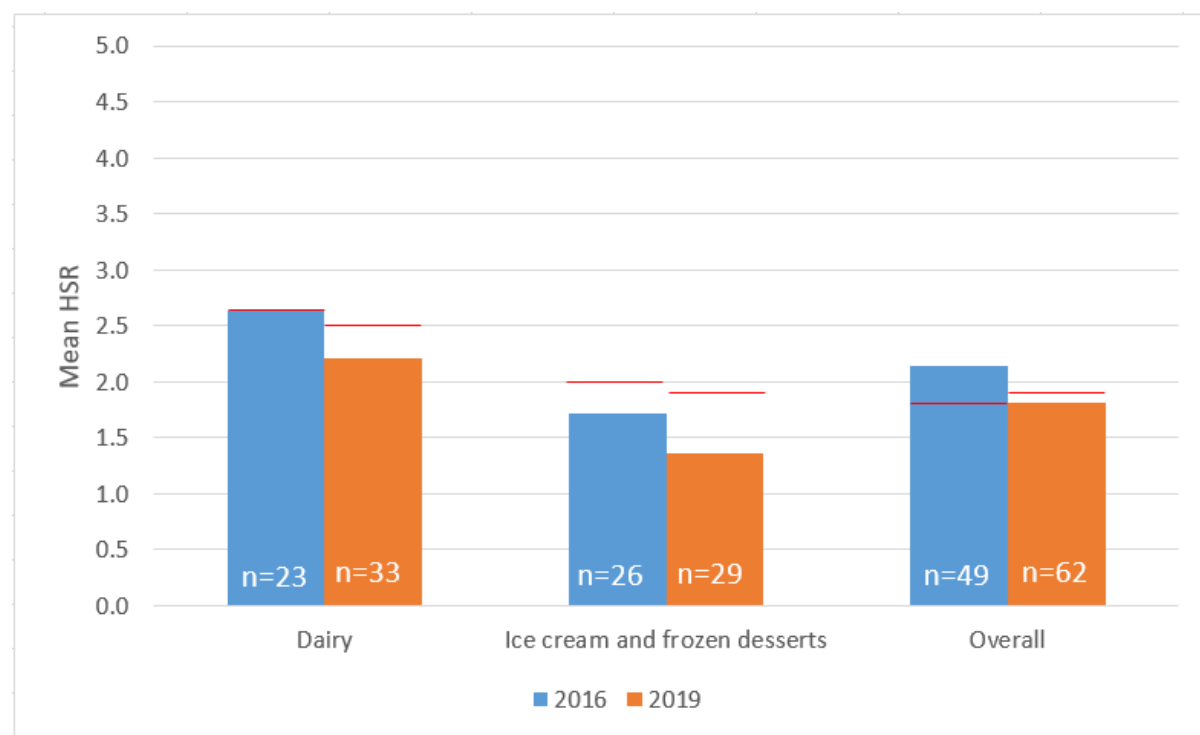
In both 2016 and 2019, ITC did not provide sodium data for any of their products. Interestingly, there was a large increase in the proportion of products reporting saturated fat, from only 20% in 2016 to more than 75% in 2019 (Table 13). This trend was observed for a number of companies, likely driven by changes to the draft labelling legislation for India requiring saturated fat. Even more interesting therefore is that there were not 100% of products nor reporting saturated fat values. ITC showed a significant increase in the sugar content of their product range between 2016 and 2019 (15.1g/100g to 20.0g/100g; $p=0.0468$) driven mainly by a significant increase in the sugar content of *Confectionery* products (55.7g/100g in 2016 to 65.3g/100g in 2019; $p=0.0462$). No significant changes were observed in saturated fat or energy content.

Figure 15 Changes in mean nutrient levels for ITC; 2016-2019 – (A) Mean energy content (B) Mean saturated fat content (C) Mean sodium content (D) Mean total sugar content



KMF NANDINI

Figure 16 Changes in mean HSR by category for KMF Nandini; 2016-2019



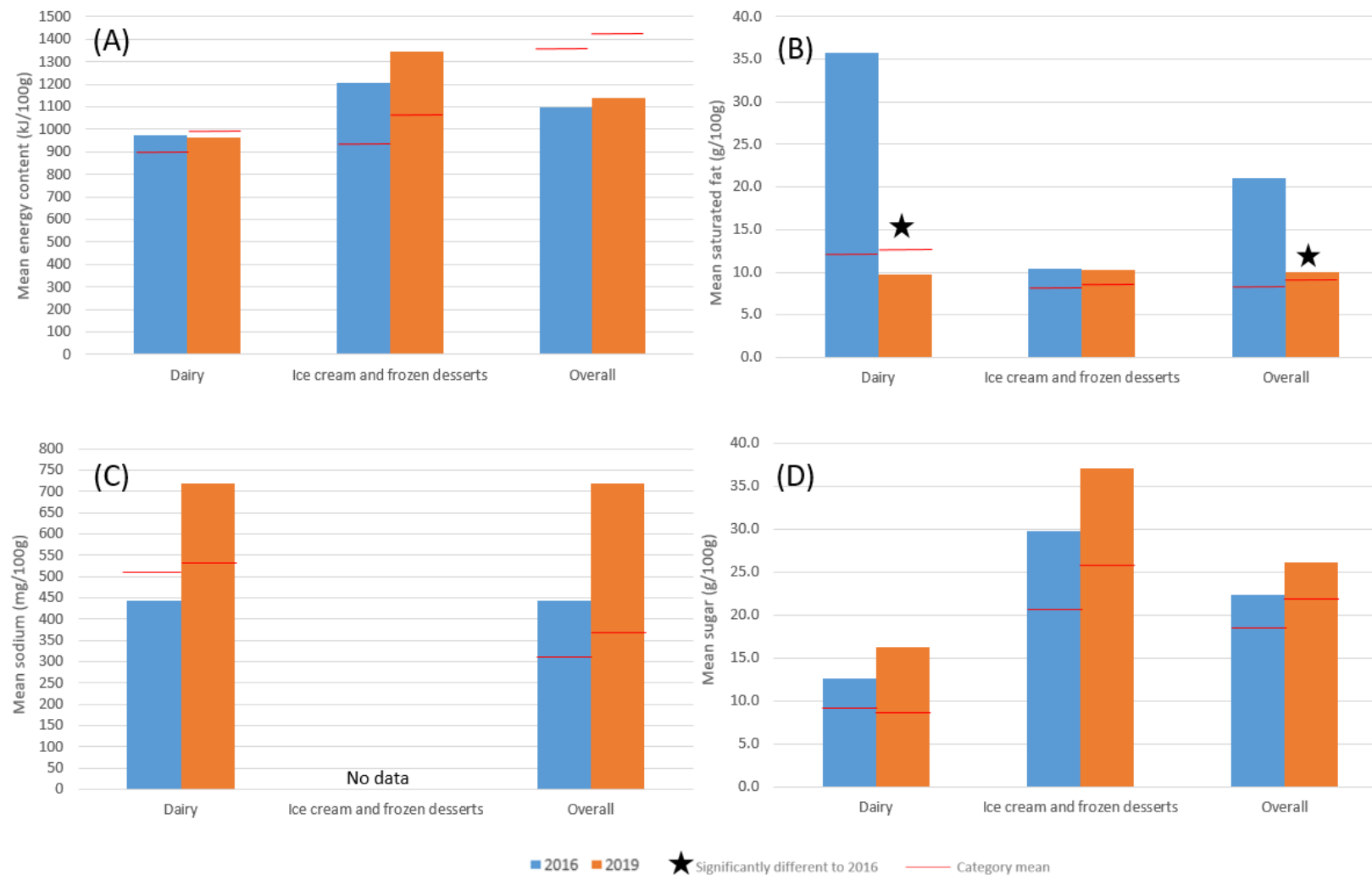
The mean healthiness of KMF Nandini products overall and in each category did not change significantly between 2016 and 2019 (2.1 to 1.8; $p > 0.05$). However, in 2019 KMF Nandini products had a lower mean HSR than the category average and lower than the combined HSR of all 11 companies.

Table 14 KMF Nandini products missing nutrient values in 2016 and 2019, by EMI subset

N (%) missing nutrient values		Dairy 2016 n=23 2019 n=33	Ice cream and frozen desserts 2016 n=26 2019 n=29	Overall 2016 n=49 2019 n=62
Saturated fat	2016	18 (78%)	19 (73%)	37 (76%)
	2019	0 (0%)	2 (7%)	2 (3%)
Sodium	2016	21 (91%)	26 (100%)	47 (96%)
	2019	30 (91%)	29 (100%)	59 (95%)
Sugar	2016	4 (17%)	1 (4%)	5 (10%)
	2019	2 (6%)	1 (3%)	3 (5%)

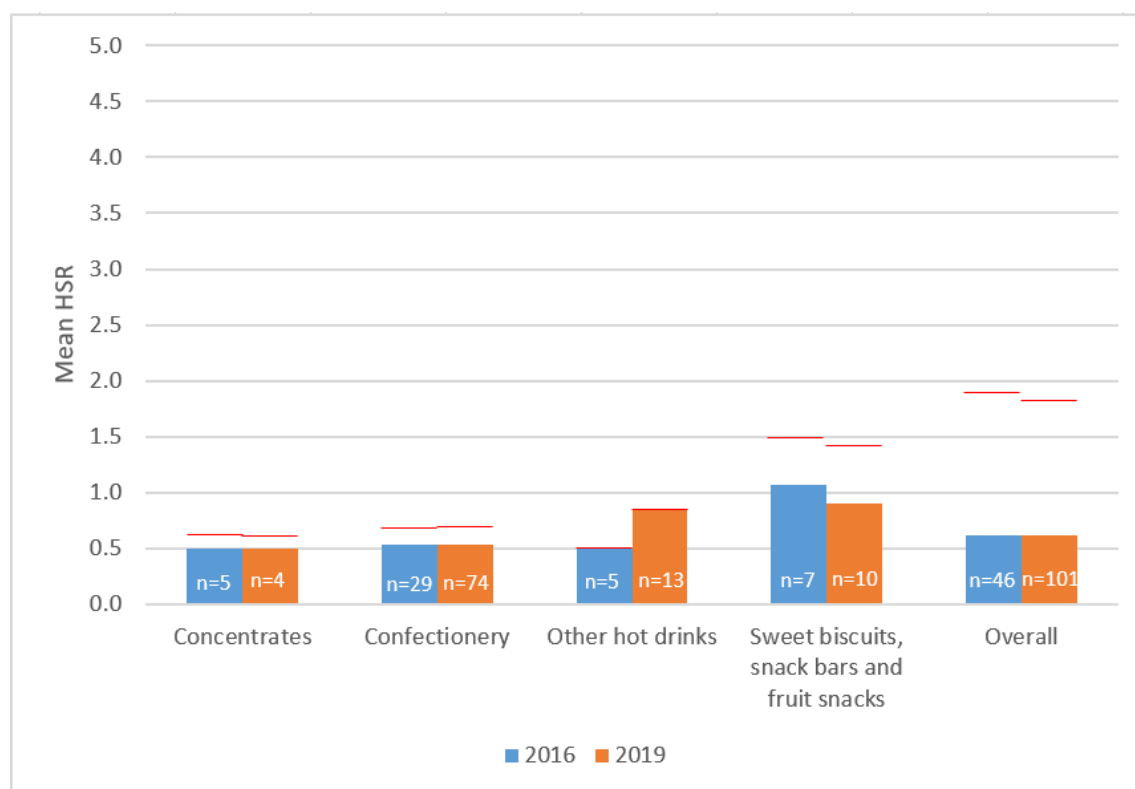
Almost 100% of products in both 2016 and 2019 did not report sodium values (Table 14). Similar to the trend observed in other companies, there was a large increase in the proportion of products reporting saturated fat values between 2016 (24%) and 2019 (97%). This increase in labelling of saturated fat likely explains the significant decrease in mean saturated fat observed overall for KMF Nandini products (Figure 17B), as the *Dairy* category reported saturated fat values on only 22% of products in 2016 (meaning proxy values would have been used in 2016) to 100% of products in 2019 (meaning no proxy values were required for analysis).

Figure 17 Changes in mean nutrient levels for KMF Nandini; 2016-2019 – (A) Mean energy content (B) Mean saturated fat content (C) Mean sodium content (D) Mean total sugar content



MONDELEZ INDIA

Figure 18 Changes in mean HSR by category for Mondelez India; 2016-2019



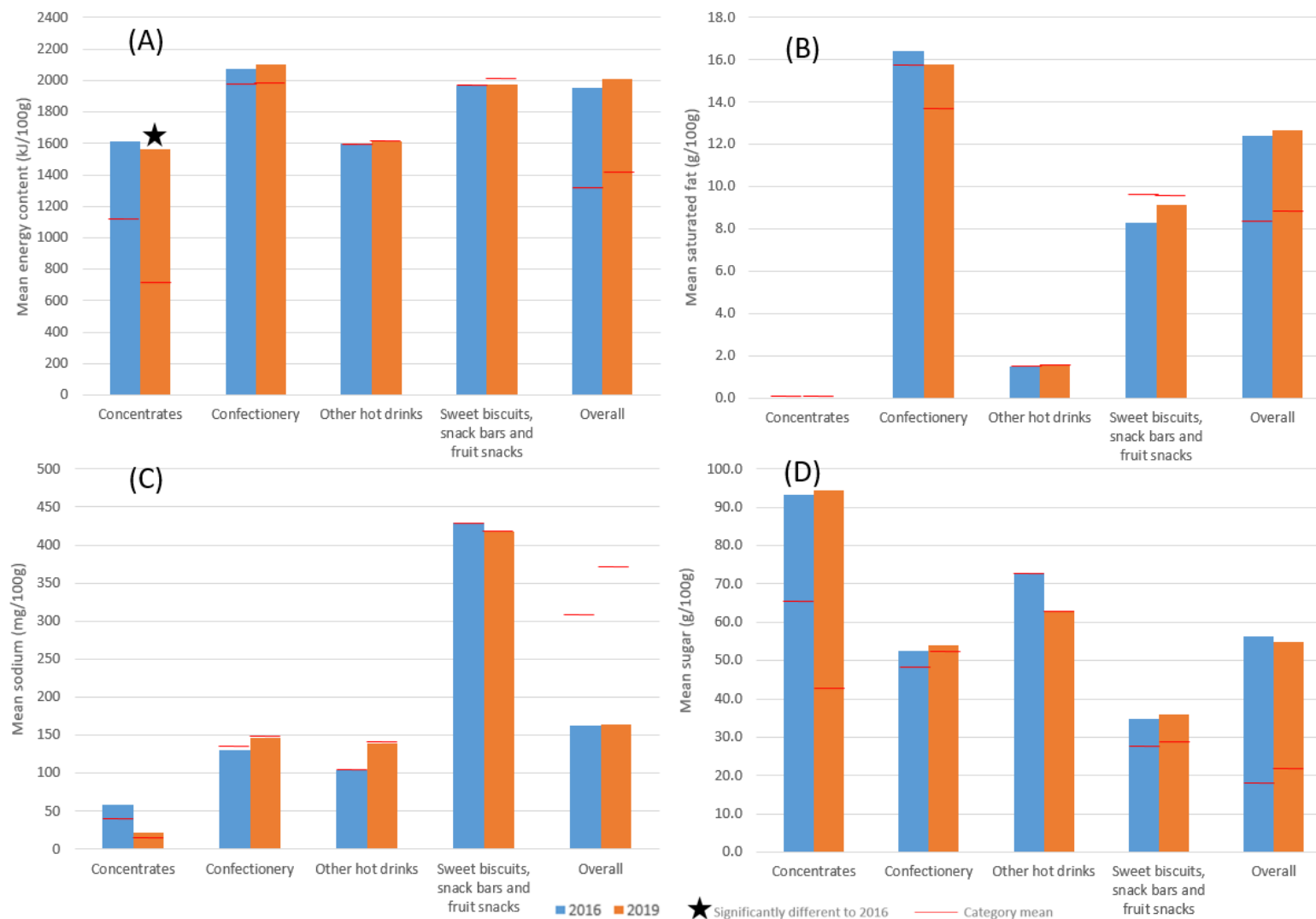
The mean healthiness of Mondelez India's product range did not change between 2016 and 2019 despite an increase in the number of assessed products in 2020, and remained the lowest of all companies in both years (0.6 HSR). Mean healthiness was below the category average for all product categories in the Mondelez India range (Figure 18).

Table 15 Mondelez India products missing nutrient values in 2016 and 2019, by EMI subset

N (%) missing nutrient values		Concentrates	Confectionery	Other hot drinks	Sweet biscuits, snack bars and fruit snacks	Overall
		2016 n=5 2019 n=4	2016 n=29 2019 n=74	2016 n=5 2019 n=13	2016 n=7 2019 n=10	2016 n=46 2019 n=101
Saturated fat	2016	2 (40%)	0 (0%)	0 (0%)	1 (14%)	3 (7%)
	2019	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Sodium	2016	0 (0%)	0 (0%)	2 (40%)	1 (14%)	3 (7%)
	2019	0 (0%)	0 (0%)	0 (0%)	1 (10%)	1 (1%)
Sugar	2016	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	2019	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

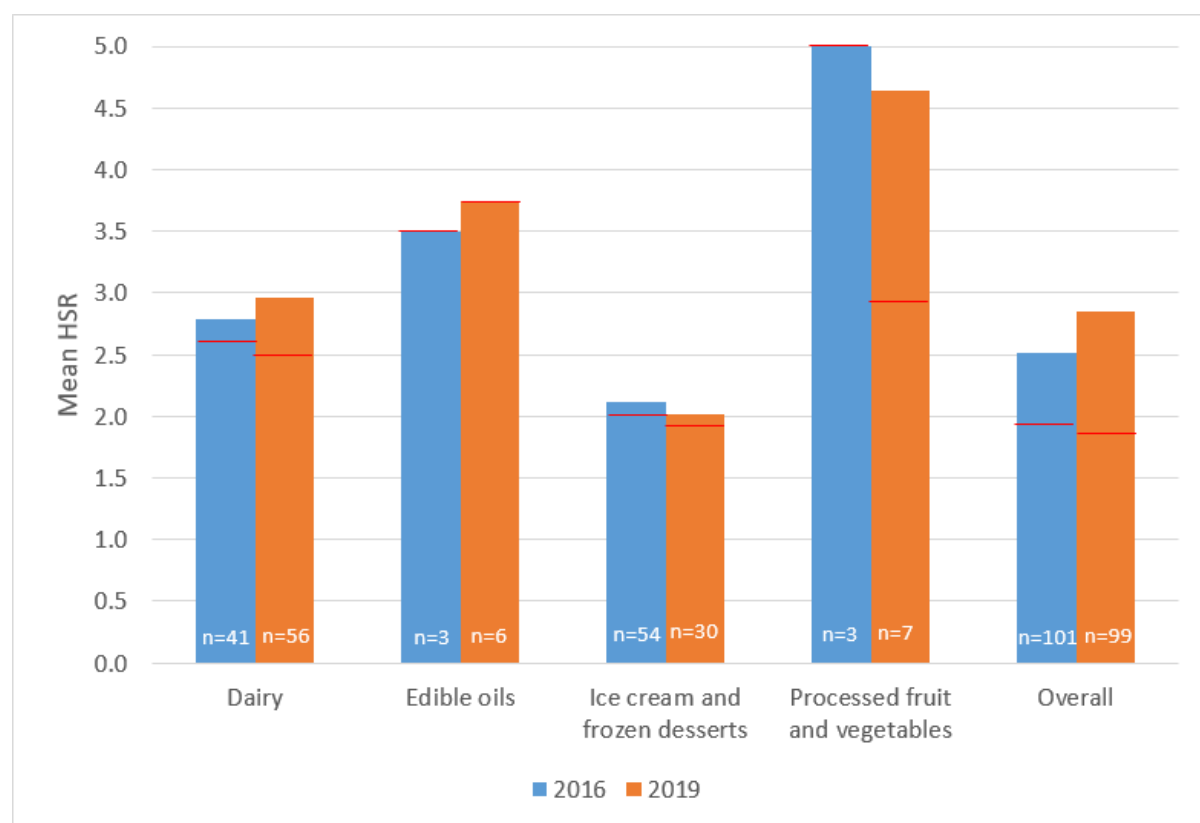
Mondelez India was one of the only companies in this analysis to display the levels of saturated fat, sodium and total sugar on the majority of their products (Table 15). No significant changes were observed between 2016 and 2019 overall for levels of any nutrient in Mondelez India's product range, however there was a significant decrease in energy content of *Concentrates* (1615kJ/100g in 2016 to 1560kJ/100g in 2019; $p=0.0057$). Mondelez India products in general were higher than the category average for energy, saturated fat and total sugar (Figure 19).

Figure 19 Changes in mean nutrient levels for Mondelez India; 2016-2019 – (A) Mean energy content (B) Mean saturated fat content (C) Mean sodium content (D) Mean total sugar content



MOTHER DAIRY

Figure 20 Changes in mean HSR by category for Mother Dairy; 2016-2019



There were no significant changes in the healthiness of Mother Dairy's overall product portfolio between 2016 and 2019 (2.5 to 2.8; $p > 0.05$). No significant changes were seen at the food category level; however, Mother Dairy generally had mean healthiness in each category at or above the category average for all 11 companies (Figure 20).

Table 16 Mother Dairy products missing nutrient values in 2016 and 2019, by EMI subset

N (%) missing nutrient values		Dairy 2016 n=41 2019 n=56	Edible oils 2016 n=3 2019 n=6	Ice cream and frozen desserts 2016 n=54 2019 n=30	Processed fruit and vegetables 2016 n=3 2019 n=7	Overall 2016 n=101 2019 n=99
Saturated fat	2016	41 (100%)	0 (0%)	54 (100%)	3 (100%)	98 (97%)
	2019	55 (98%)	0 (0%)	23 (77%)	5 (71%)	83 (84%)
Sodium	2016	38 (93%)	3 (100%)	54 (100%)	3 (100%)	98 (97%)
	2019	54 (96%)	6 (100%)	29 (97%)	7 (100%)	96 (97%)
Sugar	2016	0 (0%)	3 (100%)	0 (0%)	0 (0%)	3 (3%)
	2019	1 (2%)	6 (100%)	3 (10%)	0 (0%)	10 (10%)

Mother Dairy had a very low proportion of products in both 2016 and 2019 that reported either saturated fat or sodium on product labels (<20% for all). This left insufficient data to examine nutrient changes between 2016 and 2019 (Figure 21). Interestingly, labelling appeared selective and dependent on the product type, with *Edible oils* having 100% of products labelling saturated fat content, yet only 2% of *Dairy* products and 23% of *Ice cream and frozen desserts* products (Table 16).

Figure 21 Changes in mean nutrient levels for Mother Dairy; 2016-2019 – (A) Mean energy content (B) Mean saturated fat content (C) Mean sodium content (D) Mean total sugar content

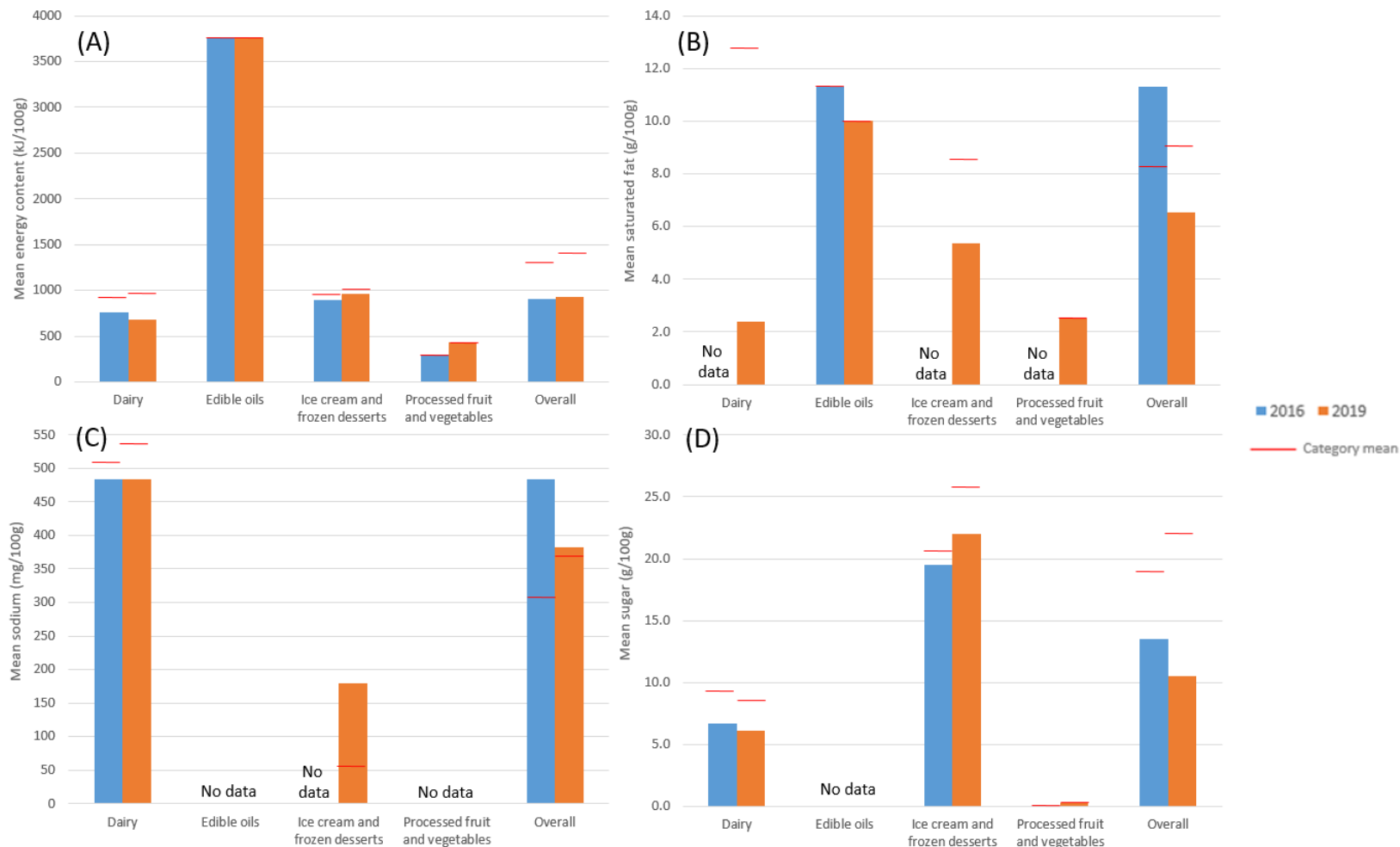
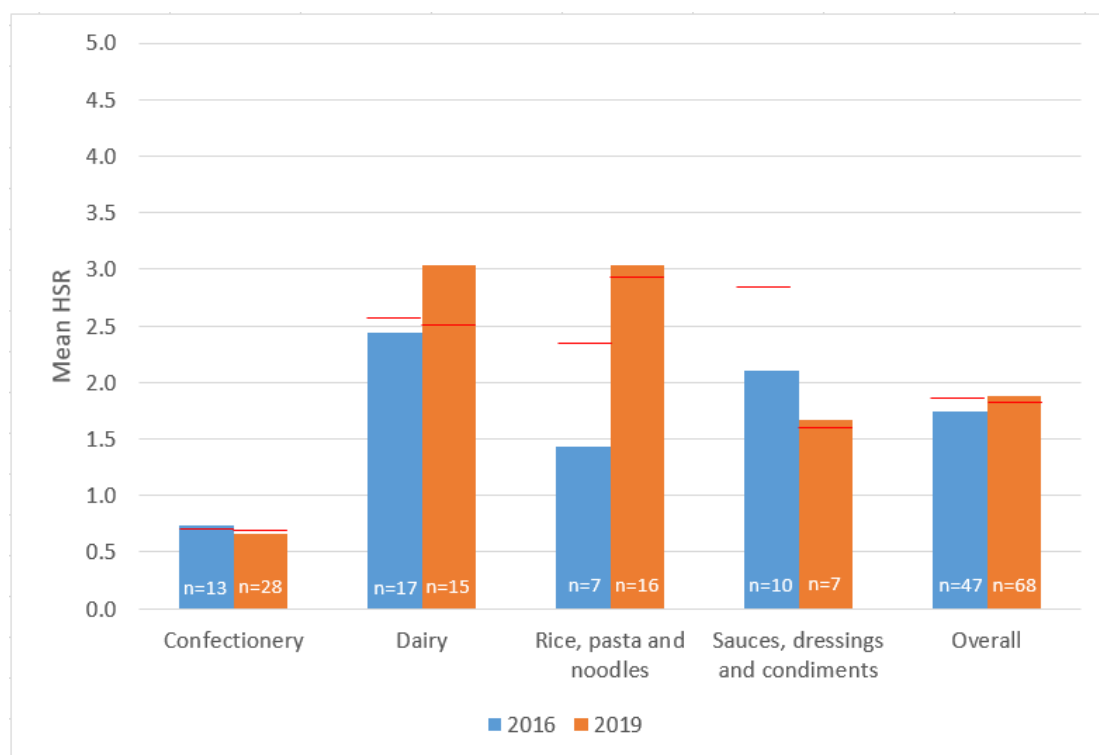


Figure 22 Changes in mean HSR by category for Nestle India; 2016-2019

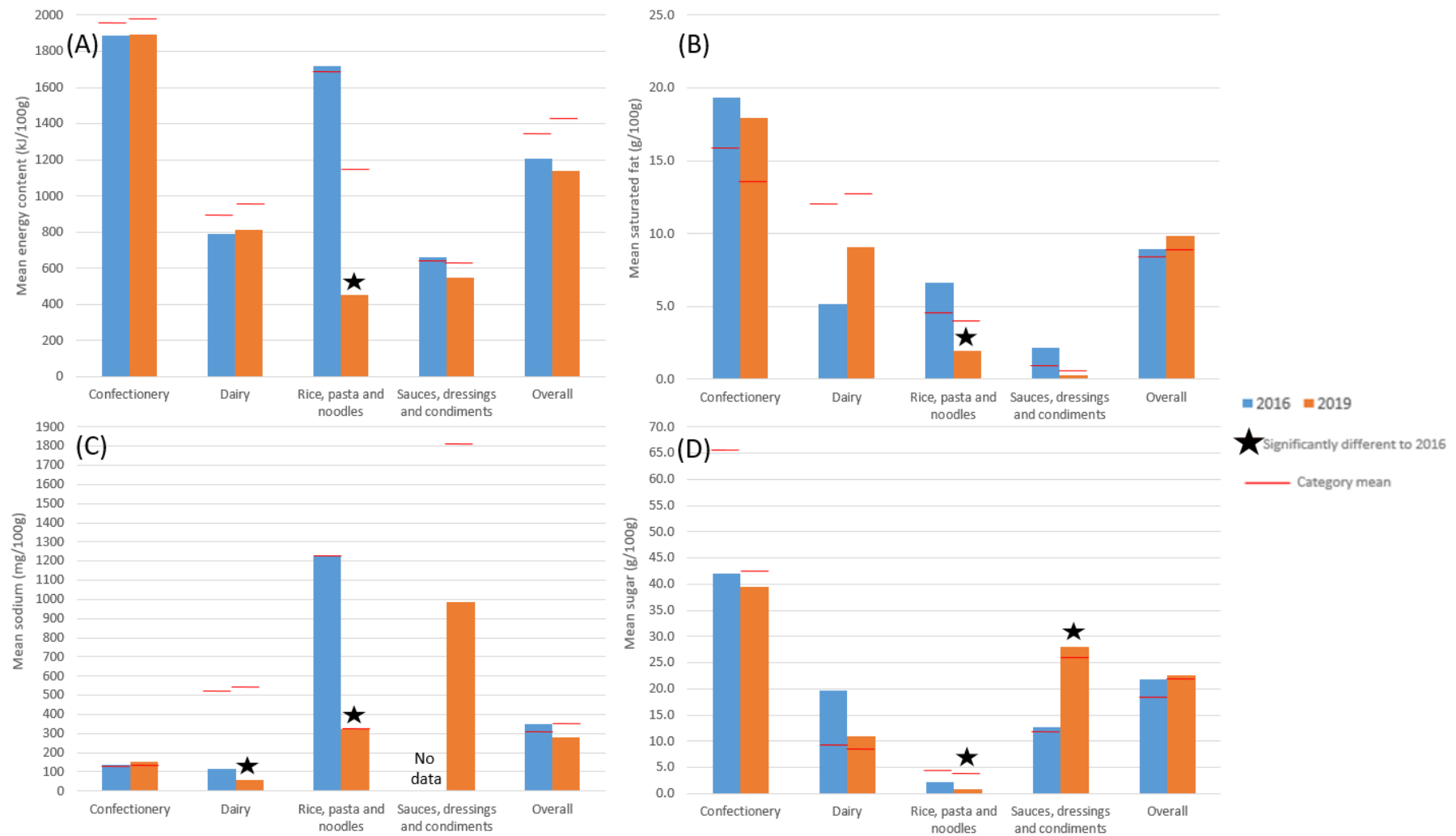
The mean healthiness of Nestlé India's overall product portfolio did not change significantly between 2016 and 2019 (1.7 to 1.9; $p>0.05$), with no significant changes observed in food categories. Interestingly, *Rice, pasta and noodles* showed a large increase in mean healthiness, which was due to a change in the types of nutrient values used in analysis for this particular category. In 2016 data were examined for products "as sold" and in 2019 "as prepared". [Appendix C](#) shows the results for Nestle when this category is excluded from analysis.

Table 17 Nestle India products missing nutrient values in 2016 and 2019, by EMI subset

N (%) missing nutrient values		Confectionery	Dairy	Rice, pasta and noodles	Sauces, dressings and condiments	Overall
		2016 n=13 2019 n=28	2016 n=17 2019 n=15	2016 n=7 2019 n=16	2016 n=10 2019 n=9	2016 n=47 2019 n=68
Saturated fat	2016	2 (15%)	0 (0%)	3 (43%)	4 (40%)	9 (19%)
	2019	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Sodium	2016	1 (8%)	5 (29%)	1 (14%)	10 (100%)	17 (36%)
	2019	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Sugar	2016	0 (0%)	1 (6%)	0 (0%)	0 (0%)	1 (1%)
	2019	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

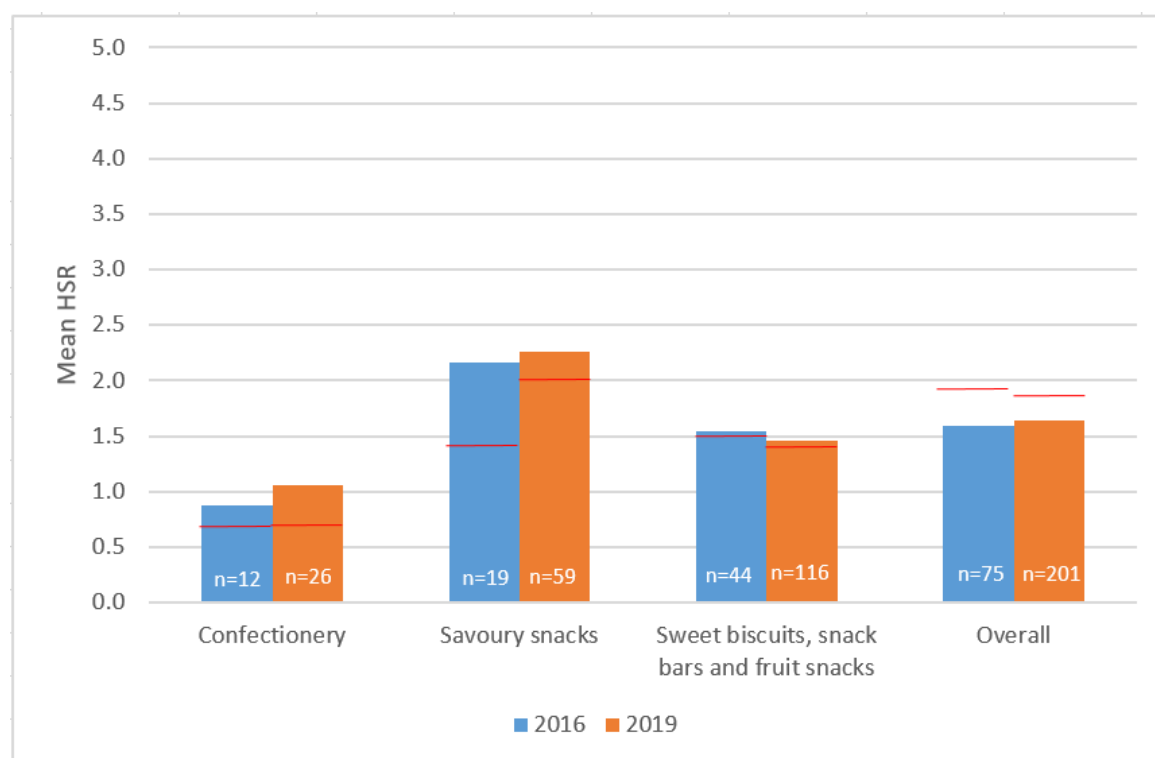
In 2019, 100% of Nestle products had information on levels of saturated fat, sodium and total sugar provided (an improvement from 2016; Table 17). The *Rice, pasta and noodles* category showed a significant decrease in all nutrients, however as previously mentioned this was due to a difference in how nutrient values were used for this category as opposed to a change in product composition. No significant changes were seen to nutrient levels overall in Nestle India's product range (Figure 23).

Figure 23 Changes in mean nutrient levels for Nestle India; 2016-2019 – (A) Mean energy content (B) Mean saturated fat content (C) Mean sodium content (D) Mean total sugar content



PARLE

Figure 24 Changes in mean HSR by category for Parle; 2016-2019



The mean healthiness of Parle Products' portfolio remained the same between 2016 and 2019 (HSR=1.6), despite a large increase in the number of products assessed in 2020. No significant changes were observed at the category level. Not surprisingly, *Confectionery* products had the lowest overall healthiness of all product categories examined (Figure 24).

Table 18 Parle Products missing nutrient values in 2016 and 2019, by EMI subset

N (%) missing nutrient values		Confectionery	Savoury snacks	Sweet biscuits, snack bars and fruit snacks	Overall
		2016 n=12 2019 n=26	2016 n=19 2019 n=59	2016 n=44 2019 n=116	2016 n=75 2019 n=201
Saturated fat	2016	10 (83%)	9 (47%)	17 (39%)	36 (48%)
	2019	9 (75%)	14 (24%)	33 (28%)	56 (28%)
Sodium	2016	12 (100%)	19 (100%)	44 (100%)	75 (100%)
	2019	26 (100%)	59 (100%)	116 (100%)	201 (100%)
Sugar	2016	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	2019	0 (0%)	1 (2%)	0 (0%)	1 (0%)

Sodium values were missing from 100% of products in both 2016 and 2019 (Table 18), yet 100% of total sugar values were displayed on product packaging. In 2016, 52% of products labelled saturated fat and this increased to 72% in 2019. No significant changes were observed overall for levels of saturated fat, total sugar or energy in Parle Products' portfolio (Figure 25), however a significant increase in energy content of *Confectionery* items was observed (48.1g/100g to 59.0g/100g; p=0.0235).

Figure 25 Changes in mean nutrient levels for Parle Products; 2016-2019 – (A) Mean energy content (B) Mean saturated fat content (C) Mean sodium content (D) Mean total sugar content

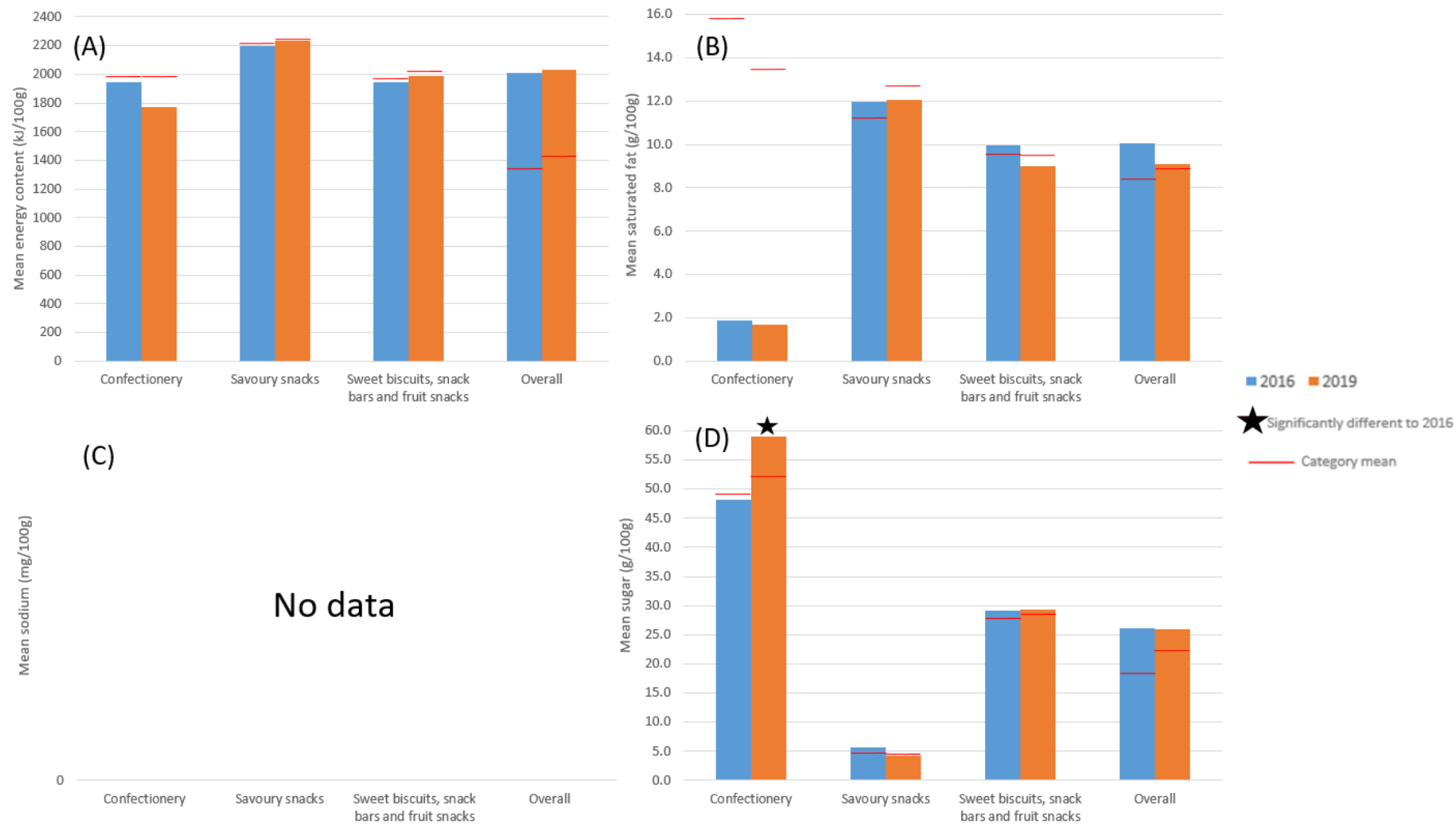
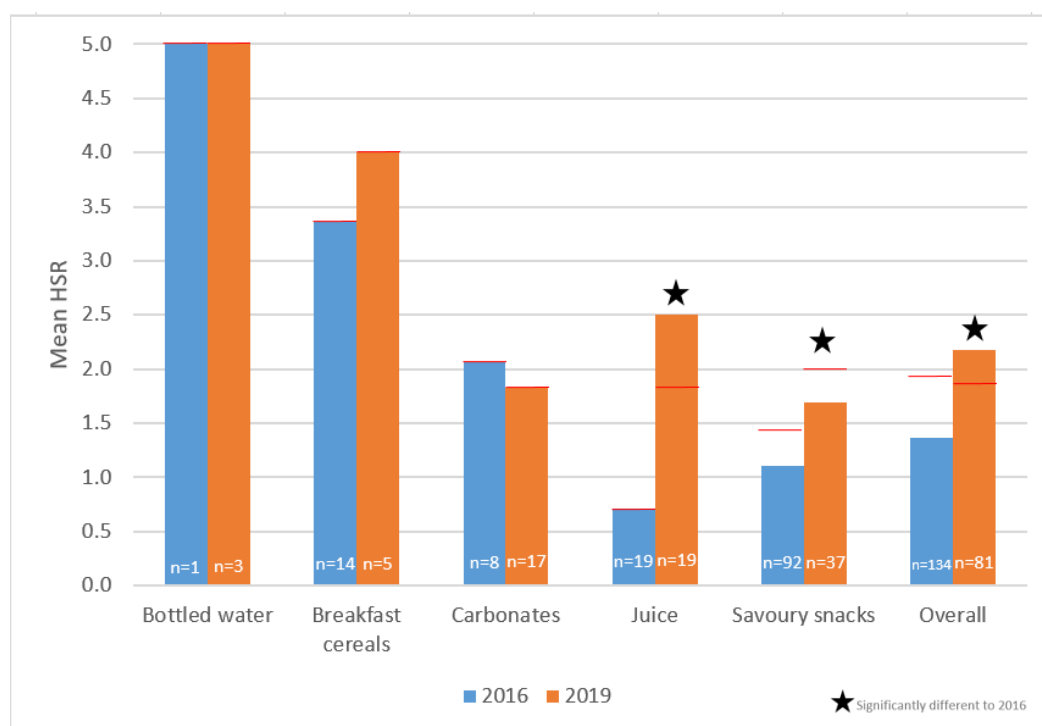


Figure 26 Changes in mean HSR by category for PepsiCo India; 2016-2019

The mean healthiness of PepsiCo India's overall product portfolio increased from 1.4 in 2016 to 2.2 in 2019 ($p < 0.0001$). This appears due to an increase in the mean HSR of *Juice* products (0.7 to 2.5; $p = 0.0002$) and *Savoury snacks* (1.1 to 1.7; $p = 0.0005$). It is worth noting that the change in the *Juice* category may be reflective of the fact that in 2019 there was a significant decrease in energy content and sugar content (Figure 27) as well as the fact that in 2019 ingredient data were provided (and were not provided in 2016) allowing for a more accurate calculation of the amount of fruit in *Juice* products in 2019.

Table 19 PepsiCo products missing nutrient values in 2016 and 2019, by EMI subset

N (%) missing nutrient values		Bottled water	Breakfast cereals	Carbonates	Juice	Savoury snacks	Overall
		2016 n=1 2019 n=3	2016 n=14 2019 n=5	2016 n=8 2019 n=17	2016 n=19 2019 n=19	2016 n=92 2019 n=37	2016 n=134 2019 n=81
Saturated fat	2016	0 (0%)	4 (29%)	3 (38%)	0 (0%)	88 (96%)	95 (71%)
	2019	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Sodium	2016	1 (100%)	7 (50%)	8 (100%)	6 (32%)	91 (99%)	113 (84%)
	2019	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Sugar	2016	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	2019	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

The overall increase in mean healthiness was also likely influenced by the huge increase in the proportion of products reporting saturated fat and sodium on the label between 2016 and 2019 (Table 19). For example, in 2016, only 29% of products labelled saturated fat and only 16% of products labelled sodium, yet in 2019 100% of products labelled all nutrients. It is difficult to know if PepsiCo India's significant increases in mean saturated fat and sodium levels are a true change or simply reflective of labelling changes.

Figure 27 Changes in mean nutrient levels for PepsiCo India; 2016-2019 – (A) Mean energy content (B) Mean saturated fat content (C) Mean sodium content (D) Mean total sugar content

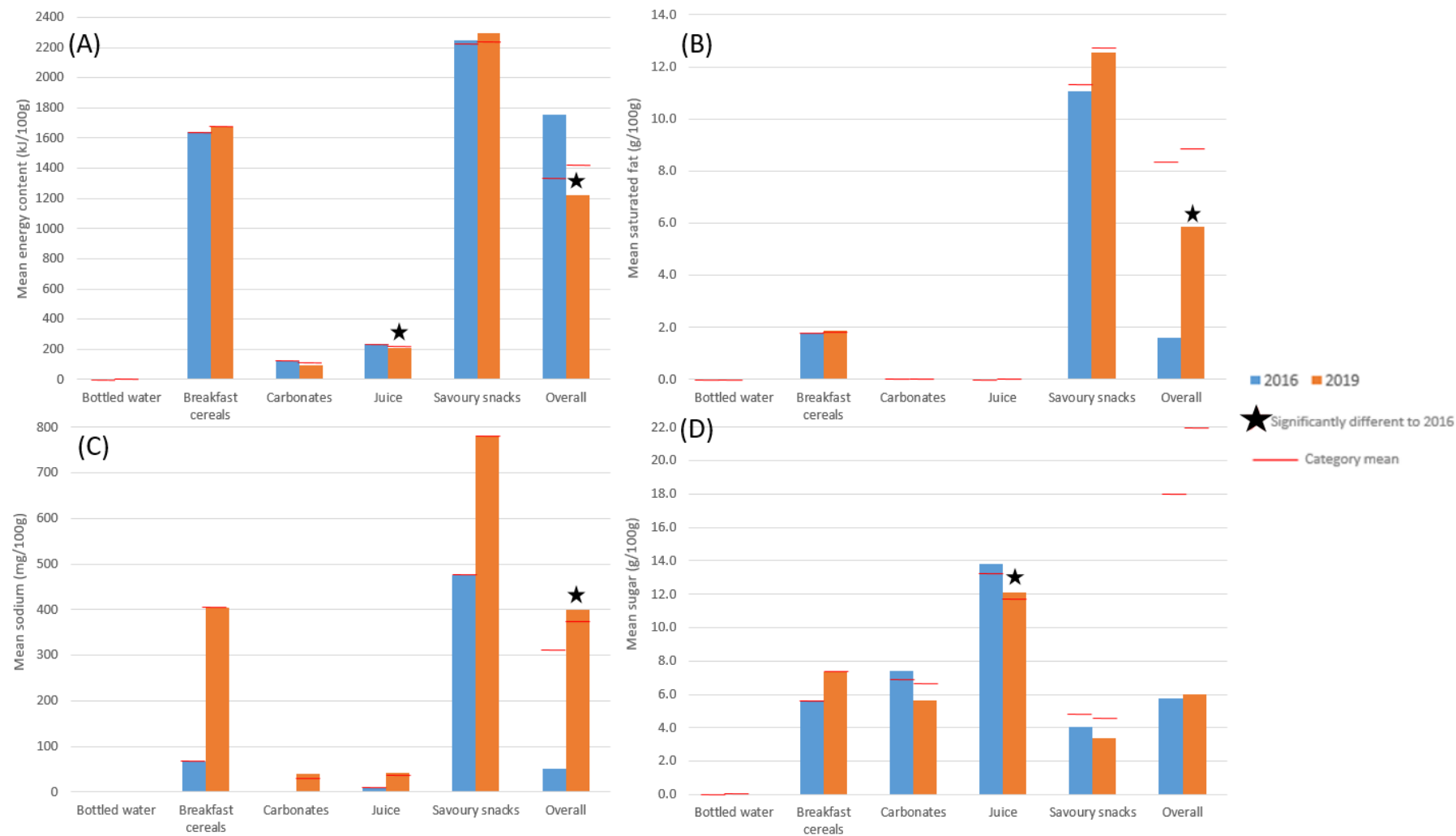


Table 20 Mean and SD HSR of food products by EMI subsets

Euromonitor Subset		Mean \pm SD 2016	Mean \pm SD 2019
FOODS	Baked goods	2.3 \pm 1.2	2.9 \pm 1.2
	Breakfast cereals	3.4 \pm 1.7	4.0 \pm 1.2
	Confectionery	0.7 \pm 0.4	0.7 \pm 0.4
	Dairy	2.6 \pm 1.4	2.5 \pm 1.4
	Edible oils	3.5 \pm 1.3	3.8 \pm 0.8
	Ice cream and frozen desserts	2.0 \pm 0.7	1.9 \pm 0.7
	Processed fruit and vegetables	5.0 \pm 0.0	4.6 \pm 0.6
	Ready meals	1.2 \pm 0.7	1.2 \pm 0.4
	Rice, pasta and noodles	2.3 \pm 1.1	2.9 \pm 0.9
	Sauces, dressings and condiments	2.8 \pm 1.0	1.6 \pm 0.7
	Savoury snacks	1.4 \pm 0.9	2.0 \pm 0.8
	Soup	3.8 \pm 0.8	3.2 \pm 0.2
	Sweet biscuits, snack bars and fruit snacks	1.5 \pm 0.8	1.4 \pm 0.7
	Sweet spreads	1.7 \pm 0.3	1.6 \pm 0.2

Table 21 Mean and SD HSR of beverage products by EMI subsets

Euromonitor Subset		Mean \pm SD 2016	Mean \pm SD 2019
BEVERAGES	Bottled water	5.0 \pm 0.0	5.0 \pm 0.0
	Carbonates	2.0 \pm 1.6	1.8 \pm 1.3
	Concentrates	0.6 \pm 0.2	1.1 \pm 0.5
	Juice	0.7 \pm 0.3	1.8 \pm 1.6
	Other hot drinks	0.5 \pm 0.0	0.8 \pm 1.2
	Sports drinks	5.0 \pm 0.0	5.0 \pm 0.0

Tables 20 and 21 show the mean and standard deviation of HSR for all products in each EMI subset from the 11 included companies.

CONCLUSIONS AND INTERPRETATION

Key findings

- The overall mean healthiness of companies' products was low in both 2016 (HSR=1.9 out of 5.0) and 2019 (HSR=1.8 out of 5.0). There was no significant change overall between 2016 and 2019.
- In 2016 KMF Nandini had the highest sales-weighted mean HSR with 3.0 out of 5.0 and Mother Dairy had the highest in 2019 with a sales-weighted mean HSR of 3.0 out of 5.0.
- PepsiCo India showed the greatest improvement in overall sales-weighted mean HSR, increasing from 1.2 in 2016 to 2.1 in 2019. Nestle India also showed a large increase from 1.6 in 2016 to 2.4 in 2019.
- Two companies had a decrease in sales-weighted mean HSR between 2016 and 2019. KMF Nandini went from a mean HSR of 3.0 in 2016 to a mean HSR of 2.2 in 2019. Similarly, Hindustan Unilever went from a mean HSR of 2.3 in 2016 to 2.0 in 2019. Despite these decreases, KMF Nandini and Hindustan Unilever still had mean HSRs that were higher than the overall mean HSR for all companies combined (1.8 in 2019).
- Only one company showed a significant increase or decrease in energy between 2016 and 2019 (PepsiCo India).
- There was a large change in the proportion of companies that reported saturated fat on product labels between 2016 and 2019. In 2016 46% of products did not report saturated fat content on the label, yet this dropped to only 15% in 2019. In 2016, only one company (Amul) had 100% of products labelling saturated fat. However, in 2019 a large improvement was seen with Britannia Industries, Mondelez India, Nestle India and PepsiCo India having 100% of their products labelling saturated fat values and the majority of remaining companies still showing an increase in the proportion of their product range reporting saturated fat values.
- There was a slight decrease overall in the proportion of products that had missing sodium values between 2016 (74% missing) and 2019 (64% missing) however sodium was still the nutrient with the most missing values on products from these 11 manufacturers.
- There was an increase in the proportion of products that had missing total sugar values between 2016 (7% missing) and 2019 (14% missing) however total sugar had the lowest proportion of missing values than when compared to sodium and saturated fat.

Methodological limitations

The results of this research should be considered in relation to the following limitations:

The limited nutrition data available. The data available were in part insufficient to evaluate the change in nutritional value of the products using the HSR because they are based on a larger number of nutrients than current Indian regulations require to be listed on packs. The problem was addressed by using proxy data unless several data points were missing. Where this was the case, products were excluded from analysis. The most likely impact of using proxy nutrient values is underestimation of the real differences between products (because proxy values were imputed at the sub-category level), and correspondingly, therefore, underestimation of the real differences between companies.

The absence of a complete list of all marketed products. Listings of all products sold in India and their nutritional content were sought from the 11 companies in both 2016 and 2019. In 2016 only one company provided full nutrition data for their product range (Hindustan Unilever), and although this increased to seven companies in 2019 (Britannia Industries, Coca-Cola India, Hindustan Unilever, KMF Nandini, Mondelez India, Nestle India and PepsiCo India), there was still a substantial amount of data for which companies did not provide feedback on. The solution was to compile listings based upon data extracted from the FoodSwitch India database in 2016, and both FoodSwitch India and Innova Market Insight's product database in 2019. Each data source is likely to be incomplete but combining data from these two sources should have achieved reasonable coverage for all companies. It seems unlikely that incomplete data collection has resulted in significant biases in the results.

Restriction of the analysis to 11 large companies. The assessment of 11 of the largest food and beverage manufacturers was a pragmatic compromise designed to ensure feasibility and meaningful comparisons

based upon the average nutritional composition of the majority of products made by each company. This strategy will not have affected the primary conclusions of the project about the relative nutritional quality of the products provided by the included companies but how the included companies compare to other smaller companies, artisanal/street food providers, quick service restaurants or home-cooked meals is unknown. We also restricted analysis to those companies that were included in both the 2016 *Product Profile* and the 2019 *Product Profile*.

Low degree of industry participation. Many of the included companies elected not to engage in the research process in both 2016 and 2019 despite being invited to do so by ATNI. Complete industry participation would have enabled more complete, up-to-date data and more reliable and informative analyses with reduced reliance on imputed values.

Limitations of the Health Star Rating. The HSR is still in early stages of implementation and subject to ongoing evaluation and refinement. While the algorithm is based upon extensive research and validation, there is continuing discussion of how it operates for some food categories. Those fruit juices that are ‘100% fruit juices’, for example, are able to receive high HSRs despite being high in fruit sugar because they receive positive points for fruit content. Another limitation in the current analysis is that in 2016, nutrition data for certain types of products (those that have different nutrient values depending on whether it is being evaluated on an “as sold” versus an “as consumed” basis) was in a different format than 2019. This issue was particularly seen in the *Rice, pasta and noodles* category (affecting Nestle India) with nutrient values in 2019 based on nutrient values “as prepared” rather than “as sold”, resulting in a large improvement in HSR and nutrient levels. This highlights the importance of companies providing *all* possible data for both research purposes and to ensure consumers have access to all information about the healthiness of the food and beverage products they are purchasing.

No consideration of serving size. Overweight and obesity can be influenced by the quantity of food people choose to consume at one sitting (portion size) and the serving size recommended on packs. This may be the case particularly for products provided in packages eaten at a single sitting (although not all such products have a serving size that corresponds to the package size). The association between serving size and portion size for products provided in packages that contain multiple servings is also not always strong. It has been argued that nutrient profiling models should include consideration of serving size but the absence of agreed national and international standards has meant that this has not proved possible to date.

Limited granularity of sales data. The sales data accessible from Euromonitor International are provided by category not by individual product. This limits the capacity to obtain robust sales-weighted estimates of metrics because it is not possible to precisely match a sales figure to an HSR value. Accordingly, for the overall sales-weighted results, the sales of the company within each category were matched to the mean HSR for all company products within that category. Erroneous results may have been generated because it is unlikely that sales volumes of every item sold by a company within a given category were the same. So, while the process should give a reasonable sales-weighted estimate of the mean healthiness of products, it is imperfect. Similarly, the sales-weighted results relating to sales of healthy products and sales of products eligible to be marketed to children are estimates, as it is unlikely that the proportion of sales of healthy products or those eligible to be marketed to children in any category is directly proportional to the total sales of that category.

Recommendations for companies

- Companies need to direct investment towards improving the healthiness of their products both by changing the mix of products sold and reformulating unhealthy products to improve their nutritional quality.
- Companies need to increase the proportion of sales deriving from healthy foods and decrease their reliance on sales of unhealthy foods. One way this can be done is by redirecting their marketing to healthier products.
- Companies need to ensure that they are providing sufficient nutrition information on their product packaging. At a minimum, companies should be providing levels of energy, saturated fat, total sugar and sodium per 100g/mL.
- Reformulation should be a priority, particularly for established brands and market-leading products unlikely to be discontinued. Companies have a particular opportunity to improve the nutritional quality of products that play a large part in children's diets to ensure that they are suitable for them and can therefore be marketed to them.

Recommendations for the Government of India

- Nutrition labelling requirements need to be strengthened to include, at a minimum, an additional requirement for labelling of sodium/salt as recommended by the Codex Guidelines on Nutrition Labelling (recognising the recently introduced requirements to label saturated fat and trans fat). Growing consumer interest in added sugar content has recently led countries such as the United States to require added sugar content in the on-pack nutrient declaration; India could consider a similar step in future legislative reform.
- Compile and maintain a comprehensive list of the nutrient content of all packaged food products such that necessary action to reformulate products can be identified, targets set and progress monitored.
- A government-led national program should be implemented with haste to address the poor nutritional quality of many of the products made by the leading food and beverage manufacturers in the Indian market.

APPENDIX A – Changes to EMI subsets between 2016 and 2019

The following table is provided to assist interpretation of results where products have been re-categorised from the 2016 India *Product Profile* to match with those used in the 2019 *Product Profile*.

2019 EMI subset	2016 EMI subsets included
Baked goods	Bread Cake Dessert mixes
Other hot drinks	Hot beverages
Savoury snacks	Savoury biscuits Savoury snacks
Sweet biscuits, snack bars and fruit snacks	Sweet biscuits
Breakfast cereals	Breakfast cereals
Confectionery	Confectionery
Dairy	Cheese Drinking milk products Yoghurt and sour milk Fats and oils (dairy-based only) Other dairy Whitener Condensed milk
Ice cream and frozen desserts	Ice cream and frozen desserts
Edible oils	Fats and oils (non-dairy)
Processed fruit and vegetables	Processed fruit and vegetables
Ready meals	Ready meals
Rice, pasta and noodles	Rice, pasta and noodles
Sauces, dressings and condiments	Cooking sauces Table sauces
Soup	Soup
Sweet spreads	Spreads (sweet spreads only)
Carbonates	Regular cola carbonates Low calorie cola carbonates Lemonade/lime carbonates Orange carbonates Mixers (excluding sparkling water) Other non-cola carbonates
Juice	Nectars Juice drinks
Bottled water	Still bottled water Mixers (sparkling water only)
Sports drinks	Sports drinks
Concentrates	Liquid concentrates Powder concentrates

APPENDIX B – Euromonitor subsets mapped to HSR Categories

The following table is provided to assist interpretation of results where products are categorised differently for the purpose of generating a nutrient profile outcome under the Health Star Rating to how these results are displayed in the analysis in this report.

Table Euromonitor food and beverage subsets mapped to Health Star Rating Categories

1. Non-dairy beverage	1D. Dairy Beverage	2. Non-Dairy Foods	2D. Dairy foods	3. Oils and spreads	3D. Cheese
Beverages	Foods				
Carbonates Hot beverages Juices Concentrates Sports drinks Bottled water	Dairy (drinking milks only)	Baked goods Breakfast cereals Confectionery Ice cream and frozen desserts* Processed fruit and vegetable products Ready meals Rice, pasta and noodles Savoury snacks Soup Sweet spreads Sweet biscuits, snack bars and fruit snacks Sauces, dressings and condiments	Dairy (including cheese products not in category 3D)*	Edible oils	Dairy (high calcium cheese products)**

* Custards, desserts, cream cheese, ice-cream and cream are not considered as dairy foods but are classified as Category 2 foods for the purpose of HSR. For further explanation see the HSR Guide for Industry <http://healthstarrating.gov.au/internet/healthstarrating/publishing.nsf/Content/guide-for-industry-document>

** Defined for the purposes of HSR as cheeses with calcium content $\geq 320\text{mg}/100\text{g}$

APPENDIX C – Results for Nestle following removal of the *Rice, pasta and noodles* category

