

# Do the foods advertised in Australian supermarket catalogues reflect national dietary guidelines?

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## Summary

Unhealthy diets are the major contributor to poor health in Australia and many countries globally. The majority of food spending in Australia occurs in supermarkets, which stock and sell both healthy and unhealthy foods. This study aimed to compare the foods advertised in the marketing catalogues (circulars) from four Australian supermarket chains with the Australian Guide to Healthy Eating. The content of national online weekly supermarket catalogues from four major Australian supermarket retailers was audited from June–September 2013 (12 weeks). Advertised products were categorized as (i) foods in the five core food groups (plus water); (ii) discretionary foods plus fats and oils; (iii) alcohol and (iv) other (food not fitting into any other category). Across all chains combined, 34.2% of foods advertised were from the five core food groups, 43.3% were discretionary foods, 8.5% were alcohol and the remaining 14.0% were ‘other’ foods. The percentage of advertised foods in the five core food groups varied between 29.3 and 38.3% across the four chains, whereas the percentage of discretionary foods varied between 34.8 and 49.0%. Australian supermarket catalogues heavily promote discretionary foods and contribute towards an environment that supports unhealthy eating behaviour. Strategies to increase the ratio of healthy-to-unhealthy foods need to be explored as part of efforts to improve population diets.

**Key words:** supermarket, circular, catalogue, diet, food

## INTRODUCTION

An unhealthy diet is the risk factor contributing most to the burden of disease in many high- and middle-income countries, including Australia ([Institute for Health Metrics and Evaluation, 2010](#)). Australian dietary guidelines recommend daily consumption of a wide variety of foods from the five core food groups. Energy-dense, nutrient-poor foods and drinks should be consumed only sometimes and in small amounts ([Australian Government Department of Health and Ageing and National Health and Medical](#)

[Research Council, 2013](#)). Despite these recommendations, consumption of foods that lie outside the core food groups is a key driver of poor health and particularly the high prevalence of overweight and obesity in Australia and many other countries ([Australian Government Department of Health and Ageing and National Health and Medical Research Council, 2013](#); [Moodie et al., 2013](#); [World Health Organization, 2013](#)).

The retail food environment is increasingly recognized as a key determinant of purchasing and eating behaviours,

being one of the key interfaces between consumers and the food system. The relationship between consumers and retailers involves a complex dynamic. While retailers certainly respond to customer demands, modern marketing and advertising techniques mean the retailer is also responsible for shaping food choices and preferences (Dawson, 2013), particularly in relation to over-consumption (Hawkes, 2008). As retailers become larger and develop ever more sophisticated marketing strategies (e.g. using smartphones and loyalty cards, celebrity endorsements, nuanced store design, electronic price tags, advanced market analytics), their influence on consumption patterns has increased (Dawson, 2013).

Large supermarkets are a particularly important part of the retail food environment, as they are usually highly accessible, are the major source of food for the majority of households and enjoy market domination in food/grocery retail expenditure in most developed nations. In Australia, 67% of all food and beverage spending (excluding alcohol) occurs in supermarkets (Spencer and Kneebone, 2012). With an extremely high market concentration in the supermarket sector relative to other countries, the four major Australian supermarket chains have a combined market share of >90% of Australian grocery sales (Mitchell, 2014). Despite their obvious importance, a number of recent reviews have found limited public health research into the impact of the supermarket food environment, particularly in relation to unhealthy foods (Gustafson *et al.*, 2012; Dawson, 2013; Escaron *et al.*, 2013).

Supermarket catalogues (also referred to as circulars) are a key component of the retail food environment as they have the potential to affect attitudes and consumer behaviours to particular foods (Glanz *et al.*, 2005). They are part of the 'information environment' which is identified as an independent component of the food environment that is unique in that it can operate at a local, regional or national level (as opposed to the consumer, community and organizational environments which are more localized; Glanz *et al.*, 2005). In Australia, as in many countries globally, supermarket catalogues are available online and in-store, and are widely distributed directly to letter boxes. Catalogues are one of the key advertising and sales promotion mechanisms for retailers, with the total number of delivered catalogues in Australia continuing to increase (8.2 billion per year in 2012; Australian Catalogue Association, 2013). Catalogues are reported to have the highest reach of any advertising medium, with 18.2 million Australians per week being reached by catalogue advertising (Australian Catalogue Association, 2013). Two-thirds of Australians report reading any sort of catalogue in the past 4 weeks according to

Roy Morgan research quoted in the Australian Catalogue Association annual catalogue industry report (Australian Catalogue Association, 2013). Grocery stores are the largest user of household catalogue delivery in Australia (1500 million delivered in 2012, increasing from ~1100 million in 2007; Australian Catalogue Association, 2013).

Studies of supermarket catalogue advertising are an important component of monitoring the food environment, and may help inform policy and practice decisions to improve the healthiness of the food environment. We are aware of only four studies worldwide, (three from the USA), to have investigated the content of catalogues from a health perspective. Ethan *et al.* conducted two analyses of New York grocery store catalogues, finding them to include a high percentage (84%) of processed foods (Ethan *et al.*, 2013, 2014). A nation-wide US study found the proportion of catalogue space allocated to sweets and sweetened beverages was highest in those areas with the highest obesity prevalence (Martin-Biggers *et al.*, 2013). More recently, Jahns *et al.* analysed the content of supermarket circulars from a single small chain over 1 year, finding some seasonal variation and a low overall proportion of fruits and vegetables advertised (Jahns *et al.*, 2014). In two of the three previous studies (Ethan *et al.*, 2013; Martin-Biggers *et al.*, 2013; Ethan *et al.*, 2014), only products placed on the first page of catalogues were analysed. The only non-US analysis of supermarket catalogue content we are aware of is a recent Dutch study that found catalogues from four leading stores to all promote a majority (66.7%) of unhealthy products (Ravensbergen *et al.*, 2015).

This study aimed to assess the degree to which supermarket catalogues in Australia promote diets consistent with government dietary recommendations. Foods included in catalogues from the four major Australian supermarket chains are compared with the recommendations of the Australian Guide to Healthy Eating (AGTHE; Australian Government Department of Health and Ageing and National Health and Medical Research Council, 2013) regarding foods that should be eaten daily (the five core food groups) and foods that should be eaten only sometimes and in small amounts (discretionary foods).

## METHODS

### Catalogue collection

The weekly catalogues produced by four large Australian supermarket chains (Woolworths,  $n = 872$  stores, market share = 39.0%; Coles,  $n = 741$  stores, market share = 33.5%; Aldi,  $n = 340$  stores, market share = 10.3% and

Independent Grocers of Australia (IGA),  $n \sim 1400$  stores, market share = 9.5%; [Metcash Trading Ltd, 2013](#); [Mitchell, 2014](#); [Wesfarmers Ltd, 2014](#); [Woolworths Ltd, 2014](#)) were examined. Woolworths and Coles are national brands, whereas Aldi has stores in three of the seven Australian states and territories. IGA consists of independently owned stores throughout Australia (except the Northern Territory) with common branding, promotion, website and purchasing by Metcash Ltd. Catalogues were collected over a 14-week period (6 June–14 September 2013), although only 12 weeks were used due to the exclusion of catalogues leading up to Father's Day in early September (due to the likelihood that this event would influence the product selection promoted). IGA catalogues related to standard IGA stores (generally medium size) and SUPA IGA (larger size, not present in all states), not IGA Xpress (convenience store size). As IGA catalogues varied by state, the catalogues for each state were collected separately. IGA catalogues were collected for 11 of the 12 survey weeks (1 week was inadvertently missed).

The hard copy for 1 week's catalogues for all stores was collected in order to compare online and hard-copy versions. These were identical, with the exception being Aldi catalogues which had fruit and vegetables placed on the back page in the hard-copy version only (missing from the national, online version presumably due to state-based differences in availability). All catalogues were sourced online from the store websites with the exception of Aldi catalogues. Because of the difference between hard-copy and online catalogues, we collected hard-copy versions from the store. We were able to obtain hard-copy Aldi catalogues for 8 weeks, but missed these for 4 weeks of the study. For these 4 weeks, we downloaded online catalogues. To ensure comparability of the online and hard-copy Aldi catalogues analysed, for the 4 weeks during which we had an online version only, we substituted the mean number of fruit and vegetables from the hard-copy catalogues collected during the other 9 weeks.

For each chain, we checked to confirm that no variation in online catalogues existed according to area-level socio-economic position (online catalogues are accessed according to postcode for Woolworths, Coles and IGA) or by state. Store catalogues were assessed from postcodes that were classified in the first and 10th deciles of the Index of Relative Social Disadvantage ([Australian Bureau of Statistics, 2006](#)) in Melbourne ( $n = 5$  stores in each decile level). No differences were observed according to socio-economic position (catalogues were identical). These results were confirmed in a smaller sample ( $n = 2$  stores in each decile level) from Sydney, Australia's other largest city. Upon examination of Woolworths, Coles and Aldi

catalogues from each Australian state, we found that some state-level differences existed based on the availability of different products in different states. Such differences were generally very small and did not impact the findings regarding the proportion of products in each category.

### Food groups and categories

The number of products in each of 23 different food groups (Table 1) was counted for each catalogue by a trained nutritionist with experience in this task. These groups were developed by the authors based on the AGTHE and the definition of 'discretionary foods' by the Australian Bureau of Statistics ([Australian Bureau of Statistics, 2014](#)). Products on all pages of each catalogue were analysed. Non-food items, supplements, medications, throat lozenges and infant formula and foods were counted and categorized as 'non-food products'.

Food products were then classified into four categories. The first category was foods from the five core food groups that, according to the AGTHE, should be consumed daily and in a wide variety. These include fruits, vegetables, dairy and alternatives, meat and alternatives and grains, as per the AGTHE. This category also included water.

The second category was 'discretionary foods' ([Australian Bureau of Statistics, 2014](#)) that, according to the AGTHE, should be eaten only sometimes and in small amounts, including processed meats, jams, confectionery and chocolate, chips, desserts and ice creams, unhealthy ready meals, full sugar and diet soft drinks, energy drinks, fruit-flavoured drinks and cordial. A description of the types of foods included in each of these subgroups is presented in Table 1. When calculating the percentage of catalogue content devoted to discretionary foods, products classified as fats and oils were also included since they are also recommended to be consumed only in small amounts.

The third category was alcohol. A fourth category of 'other' included all other edible products that did not specifically fit into any of the above categories (see Table 1). All advertised products were counted separately unless they were exact replicas (i.e. different sizes of the same product were counted as a single product). Different flavours of a particular product were counted as individual products. If no price was shown in conjunction with an advertised product (e.g. pictures of products included as part of a recipe promotion), then it was not counted.

### Analysis

The number of products in each food category was counted. The sum of all products advertised and the percentage of products in each food category were also

**Table 1:** Categorization of food products with examples (based on [Australian Government Department of Health and Ageing and National Health and Medical Research Council, 2013](#); [Australian Bureau of Statistics, 2014](#))

Category	Included
Water + five core food groups	
Fruits	Fresh, canned, dried, 100% fruit juices, pre-packaged fruit mixes
Vegetables	Fresh, canned (baked beans), frozen, pickled vegetables, pre-packaged vegetable mixes, vegetable only soup (tomato/pumpkin soup), tomato puree and pastes, vegetable juices, olives, sundried tomatoes
Dairy and alternatives	Milk (fresh and long-life), soy and other milk alternatives, all yoghurt (added fruit and full fat), cheese, cream cheese, cultured milk, custards, breakfast cereal beverages
Meat and alternatives	Fresh/frozen/roasted, beef, lamb, pork, chicken, veal, mince, crumbed raw fillets, fish, canned fish (tuna), smoked fish, seafood products, tofu, eggs
Grains	Rice, lentils, chickpeas, flour, pasta (fresh and dried), oats, bread (fruit breads), bread rolls, crumpets, English muffins, flat breads (pita), instant noodles, canned spaghetti, breakfast cereals (<30 g/100 g sugar or <35 g/100 g sugar if includes fruit), savoury biscuits (energy <1800 kJ/100 g), rye, corn and rice based biscuits, raw nuts and seeds, unsalted nuts, plain popcorn
Water	Unflavoured mineral water, sparkling water
Discretionary foods	
Processed meat	Sausages, rissoles, hamburgers, bacon, processed delicatessen meats (salami, ham), dried meats
Jams	
Confectionary and chocolate	Blocks, bars, chocolate coated products, lollies, chocolate toppings
Chips	Potato crisps, corn chips, other crisps
Desserts and ice creams	Cake, cake mixes, sweet biscuits, slices, scones, canned fruit in syrup, frozen yoghurt, sweet breads (buns, scrolls), pastries (croissant), doughnuts, icy poles
Unhealthy ready meals	Chicken nuggets, garlic bread, pizza, dumplings, spring rolls, crumbed/fried/battered meats, frozen or ready to eat chips and wedges, ready to eat meat products in sauce, meat pies, sausage rolls, ready to eat burgers, kiev, schnitzel
Other snacks	Breakfast cereals (>30 g/100 g sugar or >35 g/100 g sugar if includes fruit), savoury biscuits (energy >1800 kJ/100 g), dips, salted roasted nuts, muesli bars, snack bars, salted and flavoured popcorn
Soft drinks	Full sugar soft drinks
Soft drinks diet	Diet, sugar-free soft drinks
Energy drinks	Energy drinks
Fruit drink	Fruit flavoured drinks
Cordial	Pre-prepared syrups and concentrate
Other drinks	Flavoured milks, flavoured mineral waters, vitamin waters, sport drinks, electrolyte drinks
Discretionary-other	Cream, pastry sheets, sugar, condensed milk, icing sugar
Fats and oils	Butters, margarines, alternative spreads, oils
Alcohol	Beers, wines, spirits, alcoholic mixers
Other	Products that could not be classified into any other category, tea, coffee, milk powder, natural sweeteners, chewing gum, mixed dishes (ingredients from multiple categories that did not fall predominately under one subcategory), ready to eat and frozen meals that could not be classified as unhealthy (weight control meals), stock powder and liquid, salad dressing, sauces, vinegar, salt, breakfast spreads, mayonnaise, herbs and spices, protein powders, infant food products, mixed salads with dressing

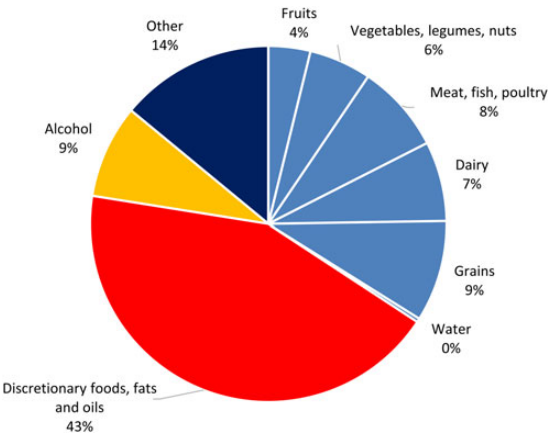
calculated. The total number of pages of food and non-food products was counted and the percentage of each catalogue devoted to each calculated. The percentage of products in each category, and the overall percentage of

‘healthy’ foods (i.e. those in the five core food groups recommended for daily consumption), discretionary foods, alcohol and ‘other’ foods was compared for the four store types. One-way analysis of variance using a Bonferroni

correction for multiple comparisons was used to test for statistically significant ( $p < 0.05$ ) differences between stores. No assessment of the size of advertisements for particular products was made. To test for temporal variation in the promotion of products over the 12 weeks of the study, we tested for differences in products displayed in the first, second and third 4-week periods. All analysis was conducted using Stata SE 12.0 (StataCorp LP, College Station, TX, USA).

RESULTS

A total of 102 catalogues were audited (12 each for Coles, Woolworths and Aldi; IGA-11 per state for Victoria, New South Wales, Queensland, South Australia, Tasmania and Western Australia). Coles had the highest average number of pages per catalogue (Coles = 33 (SE = 1.2), Woolworths = 30.7 (0.6), Aldi = 24 (0), IGA = 8.4 (0.4)),



**Fig. 1:** Summary of content in the catalogues of Australian supermarket chains (averaged over the four chains), classified as water and five core food groups, discretionary food (includes fats and oils), other foods and alcohol (see Table 1 for definitions). Non-food products excluded from the analysis.

whereas Woolworths had the highest number of food products advertised per catalogue (Woolworths = 196.7 (4.3), Coles = 164 (4.2), IGA = 117 (5.5), Aldi = 87.2 (8.6)) and Aldi had the highest number of pages devoted to non-food products (Aldi = 15.2 (0.6), Coles = 9.7 (0.5), Woolworths = 8.4 (0.3), IGA = 1.6 (0.1)). Woolworths and Coles both had more pages devoted to alcohol on average (both  $n = 2$  (0)) than Aldi (0.75 (0.28)) or IGA (0.21 (0.06)).

Figure 1 shows a summary of the percentage of foods advertised in each of the analysed categories, for all supermarket chains combined. In total, 34.2% of advertised foods were in the five core food groups recommended for daily consumption, 43.3% were discretionary foods or fats and oils, 8.5% were alcohol and the remaining 14.0% of foods were unable to be clearly categorized (Figure 1). A chain-specific summary of this data is also presented in Table 2 and Supplementary data, Table S3 (for state-level findings from IGA catalogues). In total, the percentage of advertised foods in the five core food groups recommended for daily consumption was lower for Coles (29.3%) than for Woolworths (38.3%,  $p = 0.001$  in comparison with Coles), Aldi (33.2%,  $p = 0.6$ ) and IGA (36.0%,  $p = 0.001$ ). Aldi catalogues included the lowest percentage of discretionary foods (34.8%), being lower than Coles (46.6%,  $p = 0.005$ ), Woolworths (42.4%,  $p = 0.163$ ) and IGA (49.0%,  $p < 0.001$ ) in pairwise comparisons.

The percentage of products in each of the five core food groups (plus water) is presented in Supplementary data, Table S1. Aldi included more fruits and vegetables in their catalogues (12.5% combined) than IGA (8.2%), Woolworths (6.7%) or Coles (5.9%; all  $p < 0.001$ ). The percentage of foods advertised in each of the specific discretionary food subcategories, as well as fats and oils and alcohol, is presented in Supplementary data, Table S2 for each chain. The two most commonly advertised discretionary foods were desserts and ice-creams (average of 9.7% of catalogue content across the four chains), and

**Table 2:** Percentage (95% CI) of content in the catalogues of four Australian supermarket chains, classified as five core food groups (includes water), discretionary foods (includes fats and oils), other foods and alcohol (see Table 1 for definitions)

	Supermarket chain			
	Woolworths	Coles	Aldi	IGA
Five core food groups	38.3 (36.3–40.3)	29.3 (27.5–31.1)	33.2 (27.7–38.6)	36.0 (34.7–37.4)
Discretionary foods	42.4 (40.7–44.1)	46.6 (45.3–47.8)	34.8 (24.7–45.0)	49.0 (47.3–50.7)
Other food	10.8 (9.7–12.0)	10.2 (8.8–11.5)	23.5 (17.3–29.7)	11.3 (10.4–12.1)
Alcohol	8.3 (7.0–9.6)	13.7 (12.1–15.4)	8.3 (2.7–13.9)	3.4 (1.7–5.2)

Non-food products excluded from the analysis.

unhealthy ready meals (7.1%). Aldi had a notably lower overall percentage of discretionary foods advertised, primarily due to fewer advertisements for soft drinks, chips, other snacks and unhealthy ready meals. Fats and oils were also less frequently advertised in Aldi catalogues. The percentage of alcohol products advertised was similar for Aldi and Woolworths (8.3%), but lower for IGA (3.4%) and higher for Coles (13.7%,  $p < 0.001$  in comparison with IGA). An analysis of the catalogue content in the first, second and third month of data collection revealed little variation (results not shown).

## DISCUSSION

This study provides an important assessment of the degree to which supermarket catalogues promote diets consistent with government dietary recommendations. In each of the four chains, we found a greater percentage of advertisements for discretionary foods compared with the foods in the five core food groups recommended for daily consumption. With dietary guidelines suggesting that discretionary foods should only constitute a small component of the total diet, this reflects a component of the retail food environment highly at odds with recommendations. Our findings concur with those from those from other countries, with one recent Dutch study and three previous US studies all finding supermarket circulars to heavily promote discretionary food with little emphasis on fruits and vegetables (Ethan *et al.*, 2013; Martin-Biggers *et al.*, 2013; Ethan *et al.*, 2014; Jahns *et al.*, 2014; Ravensbergen *et al.*, 2015).

By including catalogues from four large Australian chains, we were able to demonstrate that there are significant differences in advertising practices between chains. Aldi catalogues were found to be those with the lowest proportion of discretionary foods, whereas Woolworths catalogues had the highest proportion of foods in the five core food groups recommended for daily consumption. The differing market profiles of each of the chains may explain part of the variation observed. Woolworths and Coles are the largest players in a highly competitive market, with almost all of their stores of large size and offering a very broad range of products. IGA stores, by comparison, are generally smaller (particularly in urban areas where they compete with the other retailers) and designed for daily local shopping rather than large shopping trips. Aldi is a hard discounter with a limited range of food products, a variable but large range of non-food products, and a relatively high proportion of own-brand products.

Another potential driver of the findings of this study is differences in contracts between supermarket chains and food manufacturers. Details regarding which products

are included in catalogues are based on such contracts, with multinational food companies likely to have greater financial resources to ensure their products are profiled and marketed in this way. This is particularly the case for catalogues from stores with a large national market share such as Coles and Woolworths. The product assortment of multinational food companies typically includes a large number of highly processed discretionary foods (Moodie *et al.*, 2013).

Importantly, the product assortment included in catalogues is likely to be closely linked to product positioning in-store. The products placed at end-of-aisle and other in-store displays typically include those that are both on sale and promoted in catalogues. While manufacturer contracts that secure shelf space and key displays in-store ('slotting fees') have been the subject of previous scholarly investigations (Klein and Wright, 2007), we are unaware of similar investigations linking manufacturer contracts with the content of catalogues and in-store displays. This would be an important area for future investigation by both retailers and public health advocates.

Door-to-door delivery of catalogues is a major marketing tool of supermarkets in many countries. Apart from un-addressed delivery to letter boxes, supermarket catalogues are also inserted in newspapers and magazines, or provided to customers' in-store. Although very little research has been undertaken to investigate the public health impact of catalogues on consumer food choices, the extensive use of this advertising method by retailers, and the fact that its use (in Australia at least) is growing (Australian Catalogue Association, 2013) suggest that it is indeed a powerful driver of purchasing decisions. Hawkes has recently reviewed the evidence linking sales promotions to dietary behaviours, with the limited available research suggesting that sales promotions may shift short-term purchasing patterns but not longer-term dietary patterns (Hawkes, 2009). Research linking sales promotions with purchasing (rather than consumption) do, however, suggest that sales promotions may influence purchasing decisions and promote greater consumption (Hawkes, 2009; Martin-Biggers *et al.*, 2013).

Retailers frequently claim that the products they stock (the supply) are a simple function of consumer demand (Andreyeva *et al.*, 2011). Although there is likely to be some truth to this, it is also true that retailers shape demand through their marketing and advertising techniques (Dawson, 2013). It is difficult to determine to what extent customer demand and retailer strategy are influencing supermarket catalogue advertising practices. The observation by Martin-Biggers *et al.* that the rank order of a food category's prominence on the front page of US catalogues was very similar to the rank order of home expenditure on



these foods (Martin-Biggers *et al.*, 2013) could, in fact, be related to either. Regardless, it is clear from our study that the foods promoted in Australian supermarket catalogues are inconsistent with government dietary recommendations, and do not help to make the healthy choice the easy choice for consumers.

Supermarket catalogues are one component of a broader food environment that influences population diets and norms around eating behaviour (Glanz *et al.*, 2005; Swinburn *et al.*, 2013). Other closely related aspects of the food environment related to food promotion include outdoor food advertising (Settle *et al.*, 2014) and television and online food advertising. The WHO passed a resolution in 2010 for governments to take action to restrict the marketing of foods and non-alcoholic beverages to children (resolution WHA63.14; The Sixty-third World Health Assembly, 2010). However, in many countries, action in this area has been limited (Hawkes and Lobstein, 2011; Galbraith-Emami and Lobstein, 2013), and supermarket food marketing has seemingly fallen totally under the radar. While the private sector has adopted a self-regulatory approach to reducing food marketing to children, commitments, policies and actions have been limited (Sacks *et al.*, 2014), and there is little evidence of effectiveness (Kunkel *et al.*, 2014; Potvin Kent and Wanless, 2014).

This study had several strengths. With national data collection from four major retail chains, data were collected for the stores where the majority of Australians purchase the majority of their groceries. Data collection was spread over 3 months, and this is likely to reduce the effects of any weekly variations in catalogue content. Seasonal variation, however, could not be assessed in this study, with some recent evidence suggesting it can affect the product mix included in supermarket catalogues (Jahns *et al.*, 2014). By comparing catalogue contents with national dietary recommendations, we have been able to provide a simple picture of the types of foods that are advertised and how these fit into a healthy diet. Relative to the previous US catalogue studies, our study had several advantages. First, we examined all products in the catalogue rather than just those on the front page only. Second, the inclusion of catalogues from the four leading supermarket chains meant that the catalogues advertised represented retailers with >90% of national market share.

Our method of data collection resulted in certain limitations. Decisions regarding how to categorize products can influence both the percentages reported, as well as the ability to compare the results of this study with others. Here, we based our decisions on national dietary recommendations which should result in findings that are highly

relevant to all Australians. Another way of analysing catalogue data is to assess the nutritional quality of products advertised, as has very recently been done using data from the Bronx (New York) study referred to earlier (Samuel *et al.*, 2014). This could be carried out for future studies but is likely to be labour-intensive and result in nutrient-based findings that may be more difficult to conceptualize than the food-based findings presented here. Finally, we did not assess the size of advertisements, the level of price promotion used for different products or other advertising techniques in this study. Price, in particular, is a key driver of purchasing decisions (Eyles *et al.*, 2012), with analysis of this type of data forming the basis of future studies using this dataset.

## CONCLUSION

Catalogue advertising is a key marketing technique used by supermarkets. This study demonstrates that, in Australia, supermarket catalogues promote foods that are inconsistent with national dietary guidelines. Similar findings have been observed in previous US studies. From a public health perspective, this form of marketing warrants increased attention as part of efforts to improve the healthiness of food environments. The data from this study can serve as a baseline to monitor changes in catalogue content over time (Ni Mhurchu *et al.*, 2013) and across countries. Ongoing monitoring (Kelly *et al.*, 2013; Ni Mhurchu *et al.*, 2013; Sacks *et al.*, 2013) and benchmarking (Which.co.uk, 2014) can be used as part of efforts to increase accountability (Swinburn *et al.*, 2011) and encourage competition.

The results of this study, including the considerable observed variation between chains, illustrate that there is a clear opportunity for supermarket catalogues to serve less as a tool for promoting unhealthy diets, and more as a tool for the promotion of healthier foods. Given the current burden of disease related to unhealthy diets, and the prominence of supermarkets as part of the food supply, major supermarkets should be expected to have clear and transparent policies in this area. While self-regulatory action would be welcome, government policy options also need to be explored to reduce unhealthy food marketing in supermarket catalogues.

## AUTHORS' CONTRIBUTIONS

A.C. and L.T. were responsible for the initiation of the study (the concept), and with S.S. were responsible for the study design and sampling methods. S.S. was responsible for data collection. A.C. and S.S. were responsible for data analysis. All authors contributed to drafting the

paper and critical revisions prior to submission for publication. All authors reviewed and approved the final version of the manuscript.

## SUPPLEMENTARY DATA

Supplementary material is available at *Health Promotion International* online.

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## REFERENCES

- Andreyeva T., Middleton A. E., Long M. W., Luedicke J., Schwartz M. B. (2011) Food retailer practices, attitudes and beliefs about the supply of healthy foods. *Public Health Nutrition*, **14**, 1024–1031.
- Australian Bureau of Statistics. (2006) *Socio-Economic Indexes for Areas (SEIFA 2006) Australian Bureau of Statistics*. cat. no. 2033.0.55.001. <http://www.abs.gov.au/websitedbs/d3310114.nsf/4a256353001af3ed4b2562bb00121564/cbc195deddc8d84eca25740f0010e378!OpenDocument> (last accessed 5 May 2014).
- Australian Bureau of Statistics. (2014) 4364.0.55.007 - *Australian Health Survey: Nutrition First Results - Foods and Nutrients, 2011–12: Discretionary Foods*. <http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/4364.0.55.007~2011-12~Main%20Features~Discretionary%20foods~700> (last accessed 7 July 2014).
- Australian Catalogue Association. (2013) *Australian Catalogue Association Annual Catalogue Industry Report 2012/13*. [http://catalogue.asn.au/wp-content/uploads/2012/03/FINAL-MAY-2013-ACA3168\\_IndustryReport\\_vF\\_EDM.pdf\\_QTQ.pdf](http://catalogue.asn.au/wp-content/uploads/2012/03/FINAL-MAY-2013-ACA3168_IndustryReport_vF_EDM.pdf_QTQ.pdf) (last accessed 7 July 2014).
- Australian Government Department of Health and Ageing and National Health and Medical Research Council. (2013) *Australian Guide to Healthy Eating*. <http://www.eatforhealth.gov.au/guidelines/australian-guide-healthy-eating>. <http://www.eatforhealth.gov.au/guidelines/australian-guide-healthy-eating> (last accessed 5 May 2014).
- Dawson J. (2013) Retailer activity in shaping food choice. *Food Quality and Preference*, **28**, 339–347.
- Escaron A. L., Meinen A. M., Nitzke S. A., Martinez-Donate A. P. (2013) Supermarket and grocery store-based interventions to promote healthful food choices and eating practices: a systematic review. *Preventing Chronic Disease*, **10**, E50.
- Ethan D., Samuel L., Basch C. H. (2013) An analysis of Bronx-based online grocery store circulars for nutritional content of food and beverage products. *Journal of Community Health*, **38**, 521–528.
- Ethan D., Basch C. H., Rajan S., Samuel L., Hammond R. N. (2014) A comparison of the nutritional quality of food products advertised in grocery store circulars of high- versus low-income New York City zip codes. *International Journal of Environmental Research in Public Health*, **11**, 537–547.
- Eyles H., Ni Mhurchu C., Nghiem N., Blakely T. (2012) Food pricing strategies, population diets, and non-communicable disease: a systematic review of simulation studies. *PLoS Medicine*, **9**, e1001353.
- Galbraith-Emami S., Lobstein T. (2013) The impact of initiatives to limit the advertising of food and beverage products to children: a systematic review. *Obesity Reviews*, **14**, 960–974.
- Glanz K., Sallis J. F., Saelens B. E., Frank L. D. (2005) Healthy nutrition environments: concepts and measures. *American Journal of Health Promotion*, **19**, 330–333. ii.
- Gustafson A. B., Hankins S., Jilcott S. B. (2012) Measures of the consumer food store environment: a systematic review of the evidence 2000–2011. *Journal of Community Health*, **37**, 897–911.
- Hawkes C. (2008) Dietary implications of supermarket development: a global perspective. *Development Policy Review*, **26**, 657–692.
- Hawkes C. (2009) Sales promotions and food consumption. *Nutrition Reviews*, **67**, 333–342.
- Hawkes C., Lobstein T. (2011) Regulating the commercial promotion of food to children: a survey of actions worldwide. *International Journal of Pediatric Obesity*, **6**, 83–94.
- Institute for Health Metrics and Evaluation. (2010) *Global Burden of Disease Profile, Australia. Global Burden of Diseases, Injuries, and Risk Factors Study 2010* Seattle, WA. [http://www.healthdata.org/sites/default/files/files/country\\_profiles/GBD/ihme\\_gbd\\_country\\_report\\_australia.pdf](http://www.healthdata.org/sites/default/files/files/country_profiles/GBD/ihme_gbd_country_report_australia.pdf).
- Jahns L., Payne C. R., Whigham L. D., Johnson L. K., Scheett A. J., Hoverson B. S., et al. (2014) Foods advertised in US weekly supermarket sales circulars over one year: a content analysis. *Nutrition Journal*, **13**, 95.
- Kelly B., King L., Baur L., Rayner M., Lobstein T., Monteiro C., et al. (2013) Monitoring food and non-alcoholic beverage promotions to children. *Obesity Reviews*, **14**(Suppl. 1), 59–69.
- Klein B., Wright J. D. (2007) The economics of slotting contracts. *Journal of Law & Economics*, **50**, 421–454.
- Kunkel D., Castonguay J., Wright P. J., McKinley C. J. (2014) Solution or smokescreen? Evaluating industry self-regulation of televised food marketing to children. *Communication Law Policy*, **19**, 263–292.
- Martin-Biggers J., Yorkin M., Aljallad C., Ciecierski C., Akhabue I., McKinley J., et al. (2013) What foods are US supermarkets promoting? A content analysis of supermarket sales circulars. *Appetite*, **62**, 160–165.



- Metcash Trading Ltd. (2013) *About IGA*. <http://iga.com.au/support/about-iga/> (last accessed 5 May 2014).
- Mitchell S. (2014) Watch out Woolies: Aldi's rapid growth could open the door for others. *Herald Sun*. <http://www.smh.com.au/business/retail/watch-out-woolies-aldi-rapid-growth-could-open-the-door-for-others-20140212-32i11.html> (last accessed 2 February 2014).
- Moodie R., Stuckler D., Monteiro C., Sheron N., Neal B., Thamarangsi T., et al. (2013) Profits and pandemics: prevention of harmful effects of tobacco, alcohol, and ultra-processed food and drink industries. *Lancet*, **381**, 670–679.
- Ni Mhurchu C., Vandevijvere S., Waterlander W., Thornton L. E., Kelly B., Cameron A. J., et al. (2013) Monitoring the availability of healthy and unhealthy foods and non-alcoholic beverages in community and consumer retail food environments globally. *Obesity Reviews*, **14**(Suppl. 1), 108–119.
- Potvin Kent M., Wanless A. (2014) The influence of the Children's Food and Beverage Advertising Initiative: change in children's exposure to food advertising on television in Canada between 2006–2009. *International Journal of Obesity (London)*, **38**, 558–562.
- Ravensbergen E. A., Waterlander W. E., Kroeze W., Steenhuis I. H. (2015) Healthy or Unhealthy on Sale? A cross-sectional study on the proportion of healthy and unhealthy foods promoted through flyer advertising by supermarkets in the Netherlands. *BMC Public Health*, **15**, 470.
- Sacks G., Swinburn B., Kraak V., Downs S., Walker C., Barquera S., et al. (2013) A proposed approach to monitor private-sector policies and practices related to food environments, obesity and non-communicable disease prevention. *Obesity Reviews*, **14**(Suppl. 1), 38–48.
- Sacks G., Mialon M., Vandevijvere S., Trevenac H., Snowdon W., Crinoc M., et al. (2014) Comparison of food industry policies and commitments on marketing to children and product (re) formulation in Australia, New Zealand and Fiji. *Critical Public Health*, **25**, 299–319.
- Samuel L., Basch C. H., Ethan D., Hammond R., Chiazzeze K. (2014) An Analysis of Sodium, Total Fat and Saturated Fat Contents of Packaged Food Products Advertised in Bronx-Based Supermarket Circulars. *Journal of Community Health*, **39**, 775–782.
- Settle P. J., Cameron A. J., Thornton L. E. (2014) Socioeconomic differences in outdoor food advertising at public transit stops across Melbourne suburbs. *Australian and New Zealand Journal of Public Health*, **38**, 414–418.
- Spencer S., Kneebone M. (2012) *FOODmap: An analysis of the Australian Food Supply Chain*. Canberra, Department of Agriculture, Fisheries and Forestry. <http://www.agriculture.gov.au/agriculture-food/food/publications/foodmap-a-comparative-analysis>.
- Swinburn B. A., Sacks G., Hall K. D., McPherson K., Finegood D. T., Moodie M. L., Gortmaker S. L. (2011) The global obesity pandemic: shaped by global drivers and local environments. *Lancet*, **378**, 804–814.
- Swinburn B., Sacks G., Vandevijvere S., Kumanyika S., Lobstein T., Neal B., et al. (2013) INFORMAS (International Network for Food and Obesity/non-communicable diseases Research, Monitoring and Action Support): overview and key principles. *Obesity Reviews*, **14**(Suppl. 1), 1–12.
- The Sixty-third World Health Assembly. (2010) *Marketing of Food and Non-Alcoholic Beverages to Children*. Geneva, World Health Assembly. [http://apps.who.int/gb/ebwha/pdf\\_files/WHA63/A63\\_R14-en.pdf](http://apps.who.int/gb/ebwha/pdf_files/WHA63/A63_R14-en.pdf) (last accessed 5 May 2014).
- Wesfarmers Ltd. (2014) *Our Businesses: Coles*. <http://www.wesfarmers.com.au/our-businesses/coles.html>. (last accessed 5 May 2014).
- Which.co.uk. (2014) *Best and Worst Supermarkets*. <http://www.which.co.uk/home-and-garden/leisure/reviews-ns/best-and-worst-supermarkets/supermarkets-compared/> (last accessed 9 October 2014).
- Woolworths Ltd. (2014) *Our Brands: Woolworths Supermarkets*. [http://www.woolworthslimited.com.au/page/Who\\_We\\_Are/Our\\_Brands/Supermarkets/Woolworths/](http://www.woolworthslimited.com.au/page/Who_We_Are/Our_Brands/Supermarkets/Woolworths/) (last accessed 5 May 2014).
- World Health Organization. (2013) *Obesity and overweight: Fact sheet No. 311*. <http://www.who.int/mediacentre/factsheets/fs311/en/> (last accessed 18 February 2014).