Subjects and methods: In a one-year randomised parallel trial 332 overweight and obese adults, 18–72 years, who were randomised to 1 of 3 groups: CER (4200 kJ/day for women and 5040 kJ/day for men), week-on-week-off energy restriction (alternating between the same energy restriction as the continuous group for one week and one week of habitual diet), or 5:2 (2100 kJ/day on modified fast days each week for women and 2520 kJ/day for men, the 2 days of energy restriction could be consecutive or non-consecutive). Primary outcome was weight loss, and secondary outcomes were changes in body composition, blood lipids and glucose.

Results: 146 individuals completed the study (124 female, 22 male, mean BMI 33 kg/m^2), weight loss, and body fat loss at 12 months was similar in the three intervention groups, −6.6 kg for CER, −5.1 kg for the week-on, week-off and −5.0 kg for 5:2 ($p = 0.2$ time by diet). Attrition rates were not different ($p = 0.4$). HDL-cholesterol rose (7%) and triglycerides decreased (13%) at 12 months with no differences between groups. No changes were seen for fasting glucose or LDL-cholesterol.

Conclusion: We conclude that the two forms of IER were not statistically different for weight loss, body composition and cardiometabolic risk factors compared to CER.

https://doi.org/10.1016/j.orcp.2018.11.095

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Improving healthy food purchases from online canteens: A cluster RCT

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Background: School canteens represent an ideal setting to deliver public health nutrition strategies given their wide reach, and frequent use by children. Online canteens, where students order and pay for their lunch online, provide an avenue to improve healthy canteen purchases through the application strategies that impact on purchasing decisions. The aim of this study was to assess the efficacy of a consumer behaviour intervention implemented in an online school canteen in reducing the kilojoule, saturated fat, sugar and sodium content of primary student lunch orders.

Methods: Ten NSW primary schools (2,714 students) currently using an online canteen were recruited to a cluster RCT conducted over a 2-month period. Intervention schools received a consumer behaviour intervention integrated into their online menu (targeting menu labelling, healthy food availability, item placement and prompting). Control schools received no change to their online menu. Data were assessed using separate linear mixed models under an intention to treat framework with multiple imputation.

Results: Analysis of all available data ($n = 2{,}714$ students) showed significant reductions in the average energy (−567 kJ; $p < 0.001$), saturated fat (−2.37 g; $p < 0.001$) and sodium (−228 mg; $p < 0.001$) content of intervention students' lunch orders. No significant differences were observed for sugar (1.16 g; $p = 0.17$).

Conclusions: The study provides strong evidence supporting the efficacy of a consumer behaviour intervention utilising existing online canteen infrastructure to encourage healthier purchasing from primary school canteens. Such an intervention may represent an appealing policy option as part of a broader government strategy to improve child public health nutrition.

https://doi.org/10.1016/j.orcp.2018.11.096

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Using online data collection methods to estimate the price and affordability of healthy and less healthy diets under different pricing scenarios

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Introduction: Routine monitoring of diet prices and affordability is critical to inform pricing policies that can improve population diets. Monitoring currently relies on laborious in-store data collection. Studies are yet to comprehensively examine how diet prices can be monitored through the growing availability of online information and how pricing strategies (price promotions and generic brands) affect diet prices/affordability. This study aimed to address these gaps.

Methods: A scraping tool was used to automatically collect online food and beverage prices from a major supermarket chain in June 2018. Pricing information was collected for over 12,000 products. This data was used to compare the price and affordability of two diets (healthy and unhealthy) using the Australian Standardised Affordability and Pricing (ASAP) methods. The price and affordability of a healthy and unhealthy diet was compared under different pricing scenarios, which considered price promotions and generic brands. Diet affordability was measured against the national poverty line and median income quintiles.

Findings: Using the standard in-store approach, the fortnightly price of a healthy diet ($653) was estimated to be cheaper than an unhealthy diet ($820) for a household of four. When accounting for price promotions, the healthy diet remained cheaper, but the price was reduced by 3% compared to 7% for an unhealthy diet. The greatest reduction in diet prices was observed when including generic brands (healthy diet; −19%, unhealthy diet; −17%). All diet prices remained largely unaffordable when measured against the poverty line and lowest income quintile, although generic brands notably improved affordability.

Conclusions: The systematic collection of online supermarket pricing data can facilitate flexible and timely diet price/affordability analyses. These methods should continue to be tested to improve validity against previous Australian studies (by examining sources

of pricing discrepancies such as seasonal trends), to ultimately inform robust monitoring methods and pricing policies.

https://doi.org/10.1016/j.orcp.2018.11.097

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Trends in discretionary foods and beverage sales in Australian grocery and convenience stores between 2011 and 2017

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Background: Discretionary foods and beverages are regularly consumed by Australian adults and children, and contribute to dietary risk – a leading contributor to the burden of disease. Analysing sales data allows for objective analysis of trends in discretionary foods and beverages, and can help corroborate findings from diet recall surveys. We aimed to quantify trends in sales of key discretionary foods and beverages over five years across all retail settings in Australia, and examine the proportion sold in grocery and convenience stores.

Methods: We estimated annual volume sales per-capita over five years (2012–2017 for foods and 2011–2016 for beverages) for thirteen discretionary food categories and two discretionary beverage categories using the Euromonitor Global Market Information Database and estimates of the Australian resident population. Linear regression models were used to estimate annual changes over five years. Additionally, we compared information from the Euromonitor GMID and the Nielsen Market Information Digest (MID) for grocery stores and convenience stores to estimate the proportion of discretionary foods and beverages sold in grocery and convenience stores.

Results: We observed annual increases in the sales per capita of frozen pizza, frozen processed potatoes, potato chips, tortilla chips, ice-cream, sugar confectionary, chocolate confectionary, pastries, and sports and energy drinks, no significant change in sales of sweet biscuits, chocolate spreads, and cakes, and decreases in sales of savoury biscuits, processed meat and soft drinks. The majority of discretionary food and beverage sales occurred in grocery stores (>40%). Convenience stores accounted for a smaller share of sales (<10%), with the exception of sports and energy drinks (23%).

Conclusions: While discretionary food and beverage sales remain high, from a public health perspective we observed encouraging trends for select food and beverage categories. Grocery stores may be an important avenue for public health action to reduce discretionary food and beverage purchases.

https://doi.org/10.1016/j.orcp.2018.11.098

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Correlates of sugar-sweetened beverage consumption in Australian young adults

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Young adulthood represents an influential transitional period marked by poor dietary habits and excess weight gain. Sugar-sweetened beverages (SSBs) are a major source of excess caloric intake among young adults, yet little is known about the correlates of SSB consumption. This study examines the individual and situational correlates of SSB consumption, using real-time assessment of young adults' eating occasions (EO). Dietary, sociodemographic and health behaviour data were collected during the Measuring Eating in Everyday Life (MEALS) study ($n = 680$ adults, 18–30 y). Participants reported all foods and beverages consumed over 3–4 non-consecutive days using a Smartphone food diary app. For every EO, the situational characteristics such as eating location, purchase location, presence of others and activities while eating were recorded. Level of SSB consumption was determined using two approaches: frequency of SSBs per day, and amount (grams) of SSBs per day. Associations for individual level and EO level characteristics with level of SSB consumption (low/high) were analysed using multilevel logistic regression in M*plus*. Overall, 238 (35%) participants consumed SSBs of whom 48% consumed ≥98 g/d and 56% consumed ≥0.33 frequency per day. High SSB consumers (intakes ≥98 g/d) had a lower odds of being female (OR [95% CI]: 0.48 [0.29, 0.90]) and a higher odds of being overweight/obese (1.87 [1.03, 3.40]), consuming SSBs at work/university, compared to at home (2.14 [1.03, 4.45]), and purchasing SSBs from a convenience outlet, compared to a supermarket/grocery store (3.60 [1.53, 8.46]). High SSB consumption, based on frequency per day, was associated with overweight/obesity. In conclusion, over a third of young adults in this study consumed SSBs and high SSB consumption was associated with both individual and situational factors. Future research should explore how EOs containing SSBs differ from other beverage EOs, in relation to their accompanying foods and situational characteristics.

https://doi.org/10.1016/j.orcp.2018.11.099

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Sex and menstrual cycle modulate cold- and meal-induced brown adipose tissue activity in humans

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Adaptive thermogenesis is the dissipation of energy via heat production and primarily occurs in brown adipose tissue (BAT). Earlier retrospective studies suggest that BAT activity is greater in women than men. Furthermore, sex and stress steroids regulate