

# The weighty issue of Australian television food advertising and childhood obesity

Owen B. J. Carter

The average subcutaneous skinfold thickness of Australian children has been steadily increasing since the mid 1970s.<sup>1</sup> Body mass index (BMI) measurements suggest that the proportion of overweight Australian children has increased by between 60-70% since 1985 and the proportion of obese children has more than tripled.<sup>1-4</sup> This trend has been reported in most developed countries around the world.<sup>5-8</sup> Various estimates suggest that between 23-27% of Australian children are overweight, including 5-9% who are obese.<sup>4,9-12</sup>

## Health implications of childhood obesity

Obese children are at greater risk of developing cardiovascular disease,<sup>13-16</sup> high blood pressure,<sup>14,16</sup> dyslipidaemia,<sup>13</sup> type II diabetes,<sup>17,18</sup> and sleep apnoea.<sup>19</sup> There are also psychosocial problems frequently associated with childhood obesity such as depression,<sup>20</sup> social isolation,<sup>21</sup> poorer social functioning, negative physical self-perceptions, poorer general self-worth,<sup>22,23</sup> and increased risk of eating disorders.<sup>22,24</sup> Obese children also

have poorer gross motor development than their non-obese peers.<sup>25</sup> A large proportion of obese children (50-80%) also become obese adults.<sup>13,26,27</sup> The World Health Organization (WHO) links obesity in adulthood to increases in the risk of morbidity and premature mortality due to insulin resistance and type II diabetes, high blood pressure, dyslipidaemia, cardiovascular disease, stroke, sleep apnoea, gallbladder disease, hyperuricemia and gout, and osteoarthritis.<sup>28</sup> Epidemiological research also suggests that adult obesity is linked to elevated rates of death from at least 13 cancers.<sup>29</sup>

## Causes of childhood obesity

Bodyweight is regulated by numerous physiological mechanisms that maintain balance between energy intake and energy expenditure, such that obesity is a multifactorial condition with genetic and environmental predictors.<sup>30-32</sup> Parental obesity has been strongly associated with childhood obesity via both longitudinal and cross-sectional studies.<sup>27,33-36</sup> These studies are

## Abstract

**Issue addressed:** The aim of this paper is to provide an accessible overview of research literature on the link between childhood obesity and food advertising on Australian television.

**Methods:** A systematic review of current medical, public health, psychological and marketing research literature surrounding the topics of childhood obesity and television food advertising, with emphasis on Australian data.

**Results:** Childhood obesity rates have tripled since 1985, mirrored by increases in consumption of energy-dense foods. Energy-dense food advertising is ubiquitous in children's television programming, but children's ability to perceive the commercial intent of advertisements only emerges gradually as a function of age. Until such time, children are trusting, and hence vulnerable, to food advertising, influencing their desires and purchase requests to parents. There is robust evidence to suggest that television viewing and childhood obesity are related. However, the direction of causation and specific contribution of food advertising remains equivocal. Moreover, the link between television and childhood obesity is surprisingly weak, with only a small independent effect size (~1%).

**Conclusions:** Television food advertising seems to have only a very small, indirect link to childhood obesity.

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## So what?

Introducing tighter regulation of food advertising during children's television timeslots would appear to have very little, if any, meaningful effect on childhood obesity rates. Indeed, banning all television would seem to have little impact in this respect. Future health promotion energies aimed at reducing childhood obesity would be better targeted at predictors with greater effect sizes, such as the parents.

poor at controlling for environment factors, but separated twin and adoption studies suggest at least 50% of the tendency towards obesity is inherited.<sup>37-39</sup> Six genetic mutations appearing in childhood have also been identified as potential markers for obesity.<sup>40-42</sup> As such, genetic factors are important predictors of childhood obesity. Yet the rapid rise in the proportion of children in the total population who have become obese in the past 20 years is not satisfactorily explained by genetics alone; changing environmental factors that affect energy expenditure through decreased physical activity, and energy intake through increased consumption of energy-dense foods, are likely to have played a much more significant role.

### **The role of television food advertising in childhood obesity**

The contribution of television food advertising to childhood obesity has attracted a great deal of attention. The Public Health Association of Australia, the Australian Medical Association, the Royal Australasian College of Physicians, the Royal Australian College of General Practitioners, the Australian Consumers Association, Nutrition Australia, and others have called for restrictions or outright bans on television food advertising aimed at children. Most of these organisations are signatories to the Coalition of Food Advertising to Children (CFAC). The stated goal of CFAC is "to enhance the health of Australian children by calling for a ban of all television food advertising during programs where children (aged 0-12 years) make up a substantial proportion of the viewing audience".<sup>43</sup> Furthermore, the WHO recently ratified its *Global Strategy On Diet, Physical Activity And Health*, with section 46.3 urging that "food and beverage advertisements should not exploit children's inexperience or credulity".<sup>44</sup>

Such calls have fermented a cry from the food and marketing industries that television food advertising is being made the scapegoat for a far more complex problem. One industry-backed champion is William Steiger, from the US Government. At an executive WHO meeting conducted on 20 January 2004 to consider the ratification of the aforementioned global strategy, he made the following assertion:

*"In children there is a consistent relationship between television viewing and obesity. However, it is not at all clear that this association is mediated by advertising on television...the assertion that the heavy marketing of energy-dense foods or fast food outlets increases the risk of obesity is supported by almost no data."*<sup>45,46</sup>

Representative organisations for the food and marketing industries have released position statements that insist physical inactivity associated with children watching television is more likely to have contributed to increased levels of childhood obesity rather than their viewing of food advertising *per se*. Advertising academics have joined the fray, claiming that a ban on children's

television food advertising is no more than "an easy solution based on insufficient evidence that has failed to substantiate causal effects between nutrition and advertising ostensibly directed at children".<sup>47</sup> This defensive attitude is manifest in the recently ratified 2004 revision of the Australian Association of National Advertisers' self-regulated *Code for Advertising to Children – Section 2.10.1a*, which states: "Advertisements to children for food and/or beverages should not encourage or promote an inactive lifestyle combined with unhealthy eating or drinking habits".<sup>48</sup>

It would be natural for health professionals to treat claims championed by the food and marketing industries with scepticism when such bodies have obvious vested interests in this issue. Furthermore, it is tempting to accept that food advertising on children's television is a serious contributor to childhood obesity, when such is the determination of bodies like CFAC and WHO. None the less, it is incumbent upon health professionals to familiarise themselves with the evidence before espousing their own views. The aim of this paper is to provide an accessible overview of evidence from a variety of disciplines in regards to childhood obesity and the contributory role of television food advertising in Australia.

### **Method**

Original research, reviews, and commentaries were identified by searching through the academic computer databases PubMed and ScienceDirect, and the Internet database Google. Boolean expressions were entered into these databases that included the key words children, childhood, kids, obesity, overweight, television, TV, advertising, ads, food, junk food, nutrition, fat, and sugar. The search was supplemented by manual searching of reference lists from each relevant paper identified. Publications were critically reviewed and selected on the basis of their scientific merit and recency. Preference was given to those publications derived from Australian data, where possible.

### **Results**

#### **Children's television viewing behaviours**

Current statistics suggest that at least 98% of Australian children aged 5-14 years watch television and that it is by far their most popular leisure activity.<sup>49</sup> Estimates vary as to the amount of television Australian children watch, but these average at two hours and five minutes per day (range 1.6-2.5 hours).<sup>4,49-52</sup>

#### **Television and physical activity**

The food and marketing industries assert that sedentary behaviours associated with television viewing can account for increasing rates of childhood obesity. This clearly presumes that children are more sedentary than previous generations because of their television viewing behaviours; an assumption also

prevalent within the scientific literature.<sup>47,53,54</sup> However, one Australian study demonstrated that the sedentary behaviours of Perth children remained constant both before and after the introduction of television in 1959, with time devoted to television appearing to replace time children previously spent listening to radio programs, reading comics and attending cinemas. Activities such as sport participation remained unaffected.<sup>55</sup> Other researchers have demonstrated that while access to television has increased in the past half a century, the amount of time that children spend watching television per capita has remained virtually unchanged throughout the intervening period.<sup>56,57</sup>

Another inherent assumption within much of the research literature is that children watching fewer hours of television are more physically active than children watching more television. This assumption is contradicted by data indicating most children merely substitute television viewing behaviours with other sedentary behaviours, such as reading, listening to music, talking on the telephone, playing board games, etc.<sup>58</sup> Furthermore, a meta-analytic review (39 independent samples, pooled  $n=141,505$ ) indicates that the correlation between television viewing and physical activity is so small as to be considered irrelevant, and actually negative ( $r=-0.096$ ; 95% CI  $-0.080$  to  $-0.112$ ).<sup>57,59</sup>

Thus, despite the protestations of the food and marketing industries, sedentary behaviour associated with television viewing appears unable to explain the rising levels of childhood obesity observed in the past few decades. Any association between television and rising rates of childhood obesity must therefore be related to increased energy consumption.

### Changes in children's energy intake

Since 1985 the mean dietary energy intake of Australian children aged 10-15 years has increased by 7.5-11.7%. This change predominantly appears to be the result of greater consumption of carbohydrates (9.5-19.8%) than fats (-1.3-3.8%),<sup>4,60,61</sup> with much of the increase in carbohydrates being accounted for by added sugars.<sup>62</sup>

On days when children consume fast food, they have approximately 13% greater total energy intakes.<sup>63,64</sup> It is therefore unlikely to be a coincidence that the number of major fast food outlets in Australia doubled between 1992 and 2002, Australian families purchase fast food on average once every three or four days, fast food restaurants are the most popular places for buying a meal outside of the home for families with children, and hot chips, burgers, pizzas, and pastries are four of the five most popularly purchased food items in Australia.<sup>65</sup> Producers such as Arnott's (biscuits and cakes), Coca-Cola Amatil (soft drinks), Cadbury Schweppes (chocolate bars, soft drinks and cordial), and Masterfoods (confectioneries such as Mars and Snickers bars) are also four of the top 10 grocery suppliers to the Australian

market (three others are tobacco companies).<sup>66</sup> This helps supply the 93% of Australian school children who bring at least one serve of energy-dense 'junk' food to school with them per day (average 3.1 serves).<sup>67</sup>

Added sugars contribute approximately 12% to the daily energy consumption of Australian children, with the single largest contributor from the age of three years onwards being softdrinks, followed by cordials.<sup>62</sup> Comparable American data suggest that softdrinks account for 33-40% of added sugars in the diets of children and adolescents, increasing to 43-50% when sweetened fruit juices (such as cordial) are included.<sup>68,69</sup> In America, softdrinks account for as much added sugar as the next six highest contributors combined (sweetened fruit juices, 10%; candy, 5.3%; cakes, 4.9%; icecream, 4.4%; breakfast cereals, 4.3%; and biscuits, 4.1%).<sup>69</sup> Between 42-44% of Australian children consume one or more cups (250mL) of softdrink per day and 22% drink more than two cups per day.<sup>51,70</sup> Between 1992 and 1997 Australian consumption of softdrinks steadily increased by 3-5% per annum, with 120L of soft drink being consumed per capita by 1997.<sup>71,72</sup> This is somewhat less than North Americans (182L/year), but far more than Europeans (48L/year).<sup>73</sup> Although no comparable Australian information was located, American adolescents are reported to have increased their daily consumption of softdrinks by 258% between 1965 and 1996;<sup>74</sup> a trend likely to have been mirrored in Australian youth.

The evidence is clear that children's energy consumption has increased in concert with rising rates of obesity in the past two decades. It also seems clear that this has been fuelled by an increased consumption of energy-dense foods and beverages. The extent to which television advertising has contributed to this increased consumption is therefore of interest.

### Regulation of children's television advertising

The Children's Television Standards (CTS) of the Australian Broadcasting Authority ban all advertising during broadcasts of P-classified (preschool) programs and restricts advertising during C-classified (children) programs to five minutes per half-hour. Presumably as an incentive to air Australian productions, local television dramas that are C-classified are allowed to be aired with 15 minutes of advertisements per hour, the same as G-classified (general) programs.<sup>75</sup> The content of advertisements aimed at children is also restricted by the CTS such that advertisements are prohibited from encouraging children to make purchase requests of their parents or imply that possession of products is associated with superiority among peers.<sup>75</sup> However, Australian children's viewing behaviours actually peak between 7-8pm, when Australian dramas and G-classified programs are likely to be aired,<sup>76</sup> suggesting that current regulations to limit children's exposure to advertising may not be as effective as intended.

### **Children's exposure to television food advertising**

Australia has the distinction of exposing its children to more television food advertising than the US, UK, New Zealand, or 11 other western European countries.<sup>77,78</sup> Fast food companies such as McDonald's, KFC, Pizza Hut, Hungry Jacks and Dominos, and softdrink and confectionery producers such as Coca-Cola, Pepsi, Cadbury Schweppes and Masterfoods are all among the top 50 advertisers in Australia, spending a combined \$140-165 million on advertising per year.<sup>79</sup> The average estimate suggests 10 (range 9-12) food advertisements appear per hour on Australian children's television, with 80% (range 74-99%) of these being for energy-dense foods such as fast foods, softdrinks, lollies, icecream, chocolates, and snack foods.<sup>78,80-82</sup> This equates to the average Australian child viewing 6,074 energy-dense food advertisements per year, or 17 per day.

### **Children's vulnerability to television advertising**

Given the ubiquity of food advertising on children's television, it is important to establish what effect this has. The literature suggests children are aware of television advertising from an early age, usually acquiring the ability to distinguish between television advertisements and program content by 5-6 years.<sup>83-86</sup> By the age of nine years, children have as much knowledge of advertising slogans as their parents, even in product categories targeted at adults.<sup>87</sup> Younger children appear particularly vulnerable to television advertising as their appreciation of its persuasive intent only emerges slowly as a function of age and cognitive development. Several studies suggest 75-100% of six-year-olds fail to comprehend the basic purpose of television advertising, characterised by an ignorance of who pays for them, high levels of trust in advertisement messages, and describing advertisements as friendly, informative announcements for the availability of products and services.<sup>85,88-94</sup> As the cognitive abilities of children develop, an understanding emerges that enables them to recognise the persuasive commercial intent of advertising, such that by the age of 12 years they are more cynical of the claims made in advertisements, resulting in less favourable attitudes towards the advertisements and fewer purchase requests to parents. However, beliefs about the informative and persuasive intent of television advertising have been observed to coexist within children until quite late into their cognitive development.<sup>85,88</sup>

One marketing industry report defends the right to advertise to children by pointing to research suggesting children's understanding of the persuasive intent of advertising may precede their ability to satisfactorily articulate the concept.<sup>95</sup> The report cites studies where children were assumed to appreciate the persuasive intent of advertisements from a very young age onwards (3-6 years), characterised by the ability to point to pictorial depictions of product purchasing behaviours when asked what the characters in the advertisements "want

them to do".<sup>96,97</sup> However, replications of these experiments, where the number of pictorial alternatives was increased from an original two to eight, found the success rate of children choosing the purchasing behaviour, for children at least up to the age of six years, was no better than chance.<sup>96,98</sup>

### **Television advertising's influence on children**

Controlled studies have consistently shown that children exposed to advertising choose advertised products at significantly higher rates than those unexposed.<sup>99-102</sup> This heightened desire for advertised products has been observed to translate into purchase requests, and does not diminish with age.<sup>89,102</sup> It has been estimated that children influence their parents in the choice of snack food purchase and fast food restaurant patronage in around 75% of occasions, with children exposed to television advertisements being more likely to be involved in conflict with their parents when making such choices.<sup>103-105</sup> This is labelled variously within marketing books as the 'nag factor', 'pester power' or 'kidfluence'.<sup>104,106-108</sup> Two separate literature reviews have concluded that there is sufficient evidence to suggest food advertising has an independent effect on the preferences, purchasing behaviour and consumption of food by children at both brand and category levels.<sup>99,109</sup>

### **Television and energy consumption**

Given the established link between food advertising and consumption, it is important to consider the effect this has on children's macro diets. Multiple cross-sectional studies have demonstrated that children's television viewing is positively associated with higher intakes of dietary energy through fat, sweet and salty snacks, and carbonated beverages.<sup>99,110-112</sup> These studies assume that children watching more television have higher levels of exposure to food advertising and this is reflected in their energy-dense diets (via purchase requests to parents). However, the inherent weakness of such correlational studies is that they fail to establish the direction of causation, and do not provide evidence of a dose response between specific advertising and consumption of foods. Alternative explanatory mechanisms related to co-variables, such as poor parental supervision for example, cannot be ruled out at this stage. Thus, while it is plausible that observed differences in children's energy consumption can be explained by varied exposure to television food advertising, the evidence to date remains equivocal.

### **Television viewing and body weight**

An Australian cross-sectional study suggests children watching 20 hours of television or more per week (two hours 51 minutes per day) are twice as likely to be overweight or obese as children who watch less television.<sup>50</sup> This finding is replicated in an enormous study of 34 countries in Europe and North America (n= 137,593).<sup>113</sup> Similarly, a number of American studies have

found that children who watch four or more hours of television each day have greater BMI than those who watch less than two hours per day.<sup>114,115</sup> As previously described, energy expenditure appears unrelated to television viewing; thus, it might be inferred that children's increased body weights are related to television viewing via the mechanism of higher exposure to food advertising, leading to requests for and consumption of more energy-dense foods. However, the correlational nature of these studies again fails to provide evidence for causation. Only a single American intervention study was identified where the direction of causality had been established; a school program encouraging children to lessen their television viewing evidenced very modest but statistically significant lower BMI scores relative to a matched control school after six months of intervention (BMI 18.38 vs. 18.67). Interestingly, the same study observed no statistically significant differences between groups for changes in energy-dense food intake, moderate or vigorous physical activity, or fitness levels, leaving the explanatory mechanism behind the BMI reduction quite unresolved.<sup>116</sup> It therefore remains entirely possible that excessive television viewing is a symptom of childhood obesity more than a determining factor. It is interesting to note that in terms of actual effect size, the aforementioned Australian study found television viewing accounted for 1% of BMI variance in its sample.<sup>50</sup> Similarly, a meta-analytic review (52 independent samples, pooled  $n = 44,707$ ) suggested the correlation between television viewing and body fatness was quite small ( $r = 0.07$ ; 95% CI 0.06-0.08), accounting for as little as 0.5% of variance.<sup>59</sup>

## Conclusion

Health professionals are left to consider that while there is an established non-directional link between childhood obesity and television, and a plausible link with food advertising, the actual effect size is extremely small. As such, the banning of energy-dense food advertising on Australian children's television is highly unlikely to be a panacea for rampant rates of childhood obesity. Moreover, the apparently minimal relationship of children's television viewing to physical activity and body weight suggests that not even a ban of television itself would help much in this regard. This conclusion should perhaps come as no surprise when one considers the circuitous route by which television food advertising contributes to childhood obesity; its effect is mediated by multiple co-variables, such as genetics, energy expenditure, parental style, and availability of the advertised product. There is obvious need to move past many of the entrenched claims made by groups on either side of the debate surrounding the contribution of television food advertising to childhood obesity. Serious and mature public discussion surrounding this issue is required, and to this end criticisms of the conclusions drawn in the present paper are welcomed and encouraged.

Future energies directed at tackling rising rates of childhood obesity would be better spent concentrating upon predictors with effect sizes much larger than those accounted for by the likes of television food advertising. For instance, a child with obese parents is 10 times more likely to be obese;<sup>117</sup> so parents are an obvious place to start.

The fact that Australian children's energy consumption has increased in the past two decades is alone sufficient to explain increases observed in childhood obesity. Decreases in energy expenditure, whether related to television or not, are unnecessary to explain the burgeoning childhood obesity phenomenon; we merely need to recognise that increased energy consumption has not been matched by increased energy expenditure. Direct approaches to decreasing the energy imbalance, by any combination of reductions in energy intake and increases in physical activity, would seem to be the most likely way to prevent weight gain in our children, as indeed in ourselves. It has been estimated that for most of the population, this reduction only needs to be around 420KJ per day; the equivalent of walking an additional 2,000 steps, or drinking one cup less of softdrink or cordial.<sup>118,119</sup> Current and future health promotion programs that promote such and concentrate on simple messages to parents may well be the best hope for our children.

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## Author

Owen B. J. Carter, Centre for Behavioural Research in Cancer Control, Curtin University of Technology, Western Australia

## Correspondence

Dr Owen Carter, Centre for Behavioural Research in Cancer Control, Division of Health Sciences, Curtin University of Technology, GPO Box U1987, Perth, Western Australia 6845. Tel: (08) 9266 4792; fax: (08) 9266 1642; e-mail: [o.carter@curtin.edu.au](mailto:o.carter@curtin.edu.au)