




Non-core food product advertising on free-to-air television in Hong Kong

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Abstract

Objective: To study the extent and nature of free-to-air television advertisements for non-core products (e.g., fast food or soda) directed at children in Hong Kong.

Design: Television programs from two major Hong Kong free-to-air television channels airing between 06.00 and 24.00 hours from October 2018 to January 2019 were recorded. Eight nonconsecutive days (four weekdays and four weekend days) were selected for analysis. Pearson's χ^2 tests were conducted to compare the pattern of food advertisements by program categories, days of the week, television viewing periods and persuasive marketing techniques.

Setting: Free-to-air television programs.

Participants: Not applicable.

Results: Of the 10 348 commercials identified, 18.4 % were for foods, and 35.2 % of these were for non-core items. Baby and toddler milk formula (19.5 %) were the most advertised food products, while the most frequently advertised non-core food was fast foods (12.3 %). There was a higher non-core to core product ratio during prime time than the children's time slot (7 *v.* 1.7). Non-sports celebrity endorsement (27.1 %) was the most frequently used persuasive marketing technique overall, while that for non-core products was sensory characteristics (38.2 %). Most food product placements recorded were non-core products, mentions of local and fast food restaurants and recipe additions.

Conclusions: Non-core products were highly advertised in Hong Kong, while core product advertising was infrequent. Regulations on junk food advertising in Hong Kong should focus on prime time, as well as on food product placement, to reduce children's exposure to persuasive junk food marketing.

Keywords

Junk food
Non-core food product advertising
Television
Hong Kong
Product placement

Childhood obesity is one of the most prevalent 21st-century epidemics around the world⁽¹⁾, including Hong Kong, where the term 'children' is commonly used to refer to any person aged 17 years or below⁽²⁾. The Department of Health estimates that one in five Hong Kong primary school students is now overweight or obese⁽³⁾. Insulin resistance and lowered taste sensitivity among obese children may potentially hinder their ability to manage their weight in the future^(4–6), and many of them are likely to stay obese through adolescence and adulthood⁽⁷⁾. Advertising for non-core food products, defined as items which are surplus to a healthy diet (such as fast food, candy or soda)⁽⁸⁾, is believed to be one possible cause of childhood obesity^(9,10).

Advertisements promoting energy-dense and micronutrient-poor foods are potentially associated with a higher prevalence of childhood obesity, while those encouraging healthier diets have a weaker negative association with the proportion of obese children⁽¹¹⁾. In contrast to other countries, in Hong Kong, non-core food product advertisements on television appear to be less specifically directed at children, and a wide range of culturally specific foods are promoted. Furthermore, the Hong Kong free-to-air television market is dominated by two broadcasters (TVB and ViuTV)⁽¹²⁾, with TVB having the biggest share of the audience and market^(13,14). The third broadcaster only broadcasts to selected buildings with their optical network, and as such has a much smaller market share. Such a concentrated market is unlike those in any Western countries previously studied, and whether this influences the types of food advertisements shown is worth investigating.

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Apart from the advertisements aired during commercial breaks, product placement has emerged as a new marketing technique to incorporate product promotion into television programs. This new technique is known as 'indirect advertising'⁽¹⁵⁾. Indirect advertising is not restricted if 'it is presented in a natural and unobtrusive manner having regard to the program context and genre' and 'there is no direct encouragement of purchase or use of products/services'⁽¹⁵⁾. A number of studies have shown that the audience feels hungrier when they see food on the screen and that they can recall the product better after being exposed to product placements. The effect can be strengthened by repeating product exposure or having characters interact with food products. The reminder effect is hence considered to potentially affect the final product choice^(16–18). Research on indirect advertising in the Hong Kong market is still at an early stage, where there are neither qualitative nor quantitative assessments.

Previous studies on the extent and nature of television food advertising concluded that the non-core food advertising rate was higher during children's viewing time^(19–24). On the contrary, the literature shows that prime time is more likely to be associated with the airing of advertisements for non-core products than advertisements for core products (defined as items that form part of a healthy diet such as vegetables and fruits)^(25–28). As programs (and advertisements) aired during prime time are expected to have higher ratings, and children are not prohibited from watching television during prime time, both children's peak viewing time and prime time should be analysed in order to carry out a comprehensive study on junk food advertising.

Although children are not the direct purchasers, they are allowed to exercise their food preferences⁽²⁹⁾. An econometric study estimates that a ban on fast food advertising could reduce the number of overweight children by 18%⁽³⁰⁾. Non-core food and beverage advertising is regulated in various ways in different countries. For example, in South Korea, advertising for all empty calorie (energy-dense and nutrient-poor) foods was prohibited during the children's time slot⁽³¹⁾. In contrast, high fat, sugar and salt food product advertising is restricted mandatorily in Taiwan, Ireland and Chile, either by banning junk food advertising during times when children may watch television (e.g., non-school time) or regulating the persuasive power of advertisements, such as by disallowing them from being directed at children (e.g., through the use of cartoons)^(32–34). Norway and Sweden have even banned all food advertising on television designed to attract the attention of children^(32,34,35). The UK took the lead in introducing a statutory ban on food advertising for children. In 2007, the Office of Communications (OfCom), a UK government-approved authority, implemented a nutrient profiling model to score food products based on their negative nutrient content that can be offset by positive nutrients⁽³³⁾. Food and beverages with scores ≥ 4 and ≥ 1 , respectively, cannot be

advertised on television⁽³³⁾. OfCom estimates that children were exposed to 37% less high fat, sugar and salt advertising on television in 2009, 2 years after the regulation was introduced⁽³⁶⁾. There is no comparable legislation or policy regarding junk food advertising in Hong Kong, likely owing to the lack of underlying data to support the development of such regulations.

Therefore, the objective of this study is to examine the characteristics of free-to-air television advertisements for non-core products directed at children in Hong Kong. This study aims to describe and compare the pattern of food advertising in different television viewing periods and program categories and to assess the use of persuasive food marketing techniques in food advertisements to assist the Hong Kong government in formulating regulations on non-core food advertising.

Methods

Sampling

The INFORMAS research protocol was adopted in this study⁽³⁷⁾. This international protocol aims to monitor the frequency and level of children's exposure to non-core food and non-alcoholic beverage promotion, as well as the power of such promotions. Programs and advertisements broadcast on the two major free-to-air channels in Hong Kong, TVB Jade (channel 81) and ViuTV (channel 99), were recorded from Sunday, 28 October 2018 to Saturday, 26 January 2019. A random sample of eight non-consecutive days (four non-repeating weekdays and four weekend days) was selected for data coding and analysis, per the INFORMAS protocol⁽³⁷⁾. Nonconsecutive days in consecutive weeks were chosen to minimise repeating advertisements during the rebroadcasting period while ensuring data stability. Also, holidays were excluded to avoid an overabundance of holiday-related advertisements. Television programs were recorded between 06.00 and 2400 hours each day, for a total time of 144 h per channel.

Television viewing periods

Television viewing periods were defined as children's *v.* non-children's time slots and prime time *v.* non-prime time, by referring to the electronic program guide. The children's time slot was defined as 16.00–18.00 hours daily and 09.00–11.00 hours on Saturdays and Sundays. Programs broadcast during these periods were all aimed at children (cartoons, children's variety shows and educational programs); other periods were defined as the non-children's time slot for comparison. Prime time was defined as 20.00–23.00 hours daily. Programs broadcast in these periods were dramas and variety shows with a higher rating; other periods were grouped as non-prime time for comparison.



Data coding

As per the INFORMAS protocol, channel, date, day of the week, program name and category during which the advertisement was shown, advertisement product type, food advertisement data (time slot, company name, product name, product category, power of advertising (e.g., cartoon character or image of a child), premium offers (e.g., price discount), brand benefit claims (e.g., new brand development), nutrition and health claims, and advection (e.g., product ingredient detail) were coded⁽³⁷⁾. Product advertisements were also analysed for the total occurrence in terms of repeating rate (i.e., number of times the product was advertised within the sampling period). For the most frequently advertised product, the use of persuasive food marketing techniques was assessed independently.

For indirect advertising, another coding system was developed to analyse the power of product placement. Similar to the abovementioned protocol for commercials, basic information such as time of advertising and category of food being advertised was recorded. For persuasive marketing strategies, a seven-level model was used.

1. Logos or text message addressing the brand name.
2. Products prominently displayed or in the background, no direct interaction with the products.
3. Interaction with the products (e.g., eating, using), no description of the products.
4. Interaction with the products, description of sensory characteristics (taste, texture, appearance, aroma).
5. Interaction with the products, description of nutrients and other functional claims.
6. Product promotion as one of the program sections.
7. Product promotion throughout the program.

All advertisements were screened and coded. For food classification, we adopted the INFORMAS classification of 'core products,' 'non-core products' and 'miscellaneous' based on food nature and processing methods (see online supplementary material, Supplemental Table S1)⁽³⁷⁾. According to the Australian Dietary Guidelines, healthy foods were categorised as 'core foods' as they should be the main components of a balanced diet; while non-core food products are considered surplus to a balanced diet⁽⁸⁾. As products under the miscellaneous category were heterogeneous, they were analysed separately.

Statistical analysis

Data were analysed using SPSS (version 25; IBM Corp.). Frequency of food product advertising was calculated and analysed. Pearson's χ^2 test was conducted to compare the proportions of food advertisements for different program categories, days of the week, television viewing periods and persuasive marketing techniques, with $p < 0.05$ considered statistically significant.

Results

Direct advertising during commercial breaks

Overall food advertising

During the study period, there were a total of 10 348 advertisements, of which 18.4% were for foods. Prime time had a higher proportion of advertisements for foods (25.6%) than the overall sampling period, while the children's time slot had a similar proportion of advertisements for foods (18.0%) as the overall sampling period. Although non-core products were frequently advertised, comprising 35.2% of all food advertisements, the most frequently advertised product type overall was baby and toddler milk formula (19.5%), followed by dietary supplements (12.9%). Meanwhile, the entire core products group only accounted for 8.5% of the food advertisements recorded (Fig. 1). Furthermore, for core product advertising, very different patterns were observed during the children's time slot and prime time. During the children's time slot, core product advertisements stood at 18.3%, compared with 6.8% during the non-children's time slot ($\chi^2_1 = 38.97$, $P < 0.001$). During prime time, core product advertisements decreased to 4.8%, compared with 9.6% during non-prime time ($\chi^2_1 = 10.64$, $P = 0.001$). Hence, the non-core product to core product advertisement ratio was the highest during prime time (7:1) and the lowest during the children's time slot (1.7:1). There were no significant differences between weekdays and weekends for core and non-core product advertisement distribution ($P > 0.05$).

Core and non-core product advertising across television viewing periods

The food advertising pattern during prime time was similar to the overall distribution. Fast foods, which were overall the most frequently advertised non-core products (12.3% of all food advertisements), were also the most advertised non-core products during prime time (12.1% of all food advertisements during prime time) (Fig. 2(a)). With regard to core products, meat and meat alternatives were the most frequently captured overall (3.8%) and also during prime time (2.6%) (Fig. 2(b)). However, the pattern during the children's time slot was less coherent. Chocolate and candy (10.1% of all food advertisements during the children's time slot) (Fig. 2(a)) and healthy snacks (7.8%) (Fig. 2(b)) were the most advertised non-core and core products, respectively. Vegetable and fruit advertisements were spotted only five times during the 288 h of study. Vegetable advertisement was absent in both prime time and the children's time slot while fruit advertisement was only spotted once during prime time and once during the children's time slot.

Persuasive marketing techniques

Approximately 56% of food advertisements used persuasive marketing techniques, with endorsement by non-sports celebrities (27.1%) being the most frequently used. In non-core product advertising, highlighting sensory

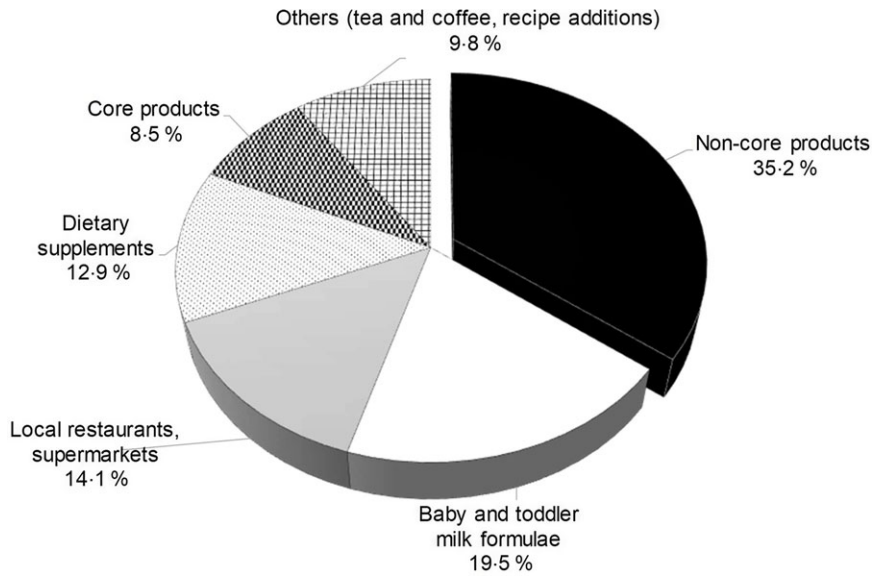


Fig. 1 Types of products advertised (n 1905)

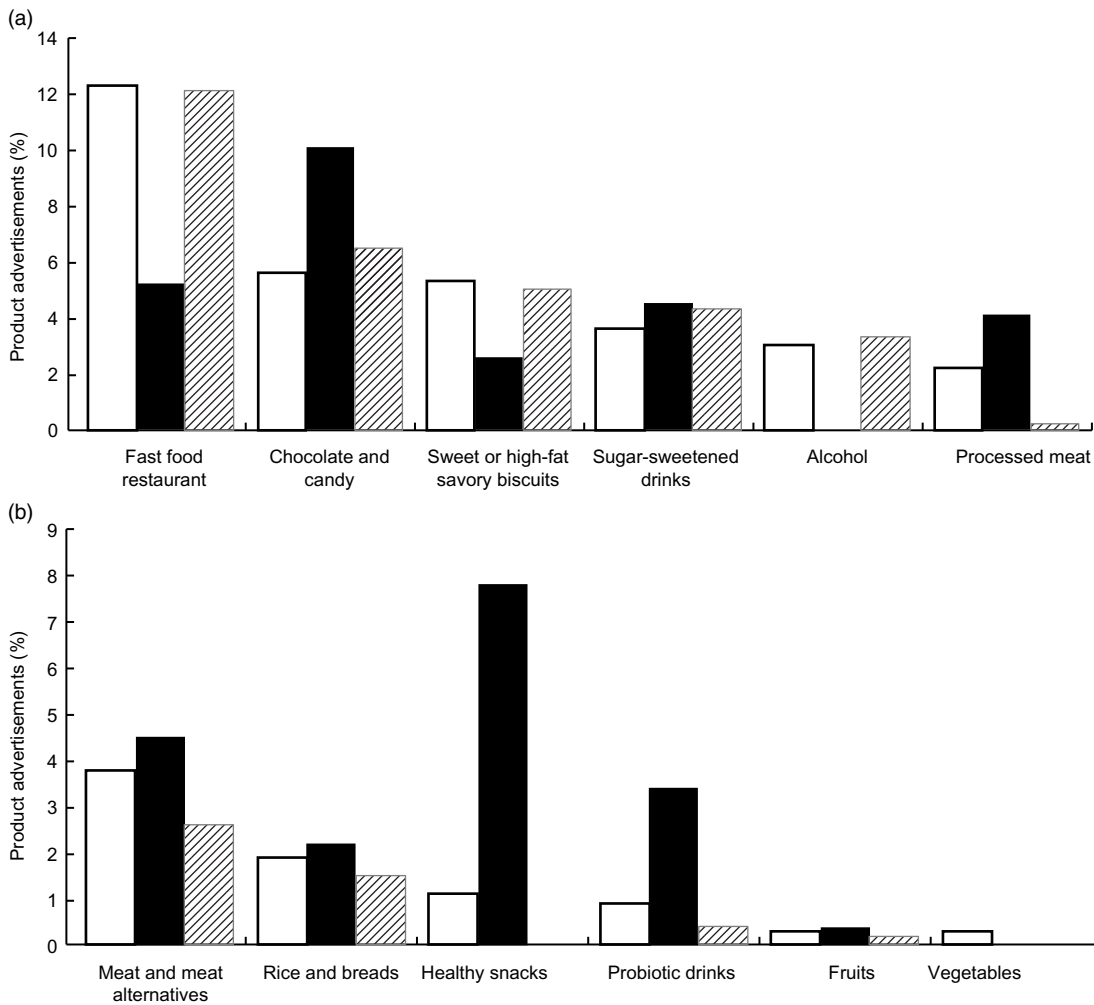


Fig. 2 (a) Top six types of non-core products advertised overall and by viewing time periods and (b) Top six types of core products advertised overall and by viewing time periods. Number of food advertisements analysed: overall: n 1905; children's time: n 268; and prime time: n 461. □, overall; ■, children's time; ▨, prime time

characteristics was the most common strategy (38.3%), and there were more non-core products utilising this marketing technique than core and miscellaneous foods ($\chi^2_1 = 87.12, P < 0.001$). Meanwhile, core products placed more emphasis on claims ($\chi^2_1 = 80.90, P < 0.001$) (Table 1). For the most advertised product type, baby and toddler milk formula, including general nutrition advertisement (82.0%), nutrient and functional claims (79.8%), and emphasising 'for kids' (51.9%), were the common marketing techniques (Table 2). It is also the main product type utilising nutrient and other functional claims in their advertisements ($\chi^2_1 = 911.12, P < 0.001$).

Repeating rate

Television advertisements had a high repeating rate. Twenty-three out of 253 advertisements repeated over twenty times during the study, and five of them repeated over fifty times. The most frequently advertised product was a baby milk formula; this advertisement was aired ninety-nine times. The most frequently advertised non-core and core product brands were 'Pizza Hut's Hawaiian paradise pizza and Portuguese chicken rice' (fifty-two times) and the 'Donald Russell sirloin steak' (thirty-seven times), respectively (see online supplementary material, Supplemental Table S2).

Table 1 Persuasive marketing techniques applied in food and drinks advertisements during commercial breaks

Persuasive marketing techniques*	Advertisements†		Non-core products		Core products		Misc products	
	n‡	%	n‡	%	n‡	%	n‡	%
Power of advertising								
No strategies used	838	44.0	427	63.6	41	25.5	370	34.5
Strategies used	1067	56.0	244	36.4	121	74.5	702	65.5
Celebrity (non-sports)	516	27.1	157	23.4	64	39.8	295	27.5
'For kids'	297	15.6	29	4.3	28	17.4	240	22.4
Non-sports/historical events/festivals	116	6.1	22	3.3	5	3.1	89	8.3
Awards	55	2.9	2	0.3	2	1.2	51	4.8
Cartoon/company owned character	49	2.6	12	1.8	21	13.0	16	1.5
Licensed character	20	1.0	14	2.1	0	0.0	6	0.6
Sports event	8	0.4	8	1.2	0	0.0	0	0.0
Famous sportsperson	6	0.3	0	0.0	0	0.0	6	0.6
Premium offers								
No premium offers	1445	75.9	490	73.0	99	60.9	857	79.9
With premium offers	460	24.1	181	27.0	63	39.1	215	20.1
Price discount	204	10.7	136	20.3	9	5.6	59	5.5
Gift or collectable	197	10.4	18	2.7	44	27.3	134	12.5
20% extra or other	29	1.5	6	0.9	10	6.2	13	1.2
Limited edition	16	0.8	16	2.4	0	0.0	0	0.0
Pay 2 take 3 or other	14	0.7	5	0.7	0	0.0	9	0.8
Brand benefit claims								
No strategies used	349	18.3	75	11.2	23	14.3	251	23.4
Strategies used	1556	81.7	596	88.8	139	85.7	821	76.6
Emotive claims (fun, feelings, popularity)	485	25.5	198	29.5	24	14.9	263	24.5
Sensory based characteristics (taste, texture, appearance, aroma)	458	24.0	257	38.3	57	35.4	144	13.4
Suggested users are children or whole family	218	11.4	99	14.8	25	15.5	94	8.8
Price	138	7.2	19	2.8	11	6.8	108	10.1
New brand development	130	6.8	14	2.1	7	4.3	109	10.2
Suggested use	57	3.0	8	1.2	6	3.7	43	4.0
Puffery (claiming to be advantageous over other products)	54	2.8	1	0.1	8	5.0	45	4.2
Convenience	16	0.8	0	0.0	0	0.0	16	1.5
Claims								
No claim present	1089	57.2	578	86.1	38	23.6	473	44.1
Claim present	816	42.8	93	13.9	124	76.4	599	55.9
Nutrient and other function claim	416	21.8	12	1.8	0	0.0	404	37.7
Health related ingredients claims	130	6.8	19	2.8	0	0.0	110	10.3
Other claims (e.g., organic)	127	6.7	9	1.3	86	52.8	33	3.1
General health claims	75	3.9	46	6.9	0	0.0	29	2.7
Nutrient comparative claims	39	2.0	0	0.0	38	23.6	1	0.1
Nutrient content claims	25	1.3	7	1.0	0	0.0	18	1.7
Reduction of disease risk claims	4	0.2	0	0.0	0	0.0	4	0.4
Advercation								
No advercation present	1216	63.8	627	93.4	148	91.3	442	41.2
Advercation present	689	36.2	44	6.6	14	8.7	630	58.8
General nutrition	457	24.0	0	0.0	1	0.6	456	42.5
Details on product ingredients	232	12.2	44	6.6	13	8.1	175	16.3

*Categories with no input were not listed.

†Include core products, non-core products and miscellaneous.

‡n for each technique category: overall = 1905; non-core products = 671; core products = 162; miscellaneous products = 1072.

Table 2 Persuasive marketing techniques applied in baby and toddler milk formula advertisements (*n* 372 for each technique category) during commercial breaks

Persuasive marketing techniques*	Advertisements	
	<i>n</i>	%
Power of advertising		
No strategies used	6	1.6
Strategies used	366	98.4
'For kids'	193	51.9
Celebrity (non-sports)	141	37.9
Awards	32	8.5
Premium offers		
No premium offers	372	100
Brand benefit claims		
No strategies used	88	23.7
Strategies used	284	76.3
Emotive claims (fun, feelings, popularity)	186	50.0
New brand development	90	24.2
Suggested users are children or whole family	8	2.2
Claims		
No claim present	6	1.6
Claim present	366	98.4
Nutrient and other function claim	297	79.8
Health related ingredients claims	40	10.8
Other claims (e.g., organic)	29	7.8
Advercation		
No advercation present	67	18.0
Advercation present	305	82.0
General nutrition	305	82.0

*Categories with no input were not listed.

Indirect advertising through product placements

Prevalence of food product placements and distribution by food categories

A total of fifty-one food product placements, thirty-seven on TVB and fourteen on ViuTV, were recorded during the study, with an average of 3.2 food product placements per channel per day. Non-core products were the most frequently advertised group, accounting for 45.1% of all product placements. In contrast, core products were again the least advertised (7.8%) (Fig. 3).

Distribution of food product placements by television program and persuasive strategy

The main type of program that included indirect advertising was variety shows (47.1%) (Fig. 4). Of the fifty-one programs with product placements, 61.4% were newly produced local programs, 21.1% were acquired programs and 17.5% were rebroadcast programs. The major advertising strategies for food product placement were displaying the products prominently or keeping them in the background without direct interaction with them (27.5%). On the contrary, in 17.6% of food product placements, the product was promoted in one of the program sections (Table 3).

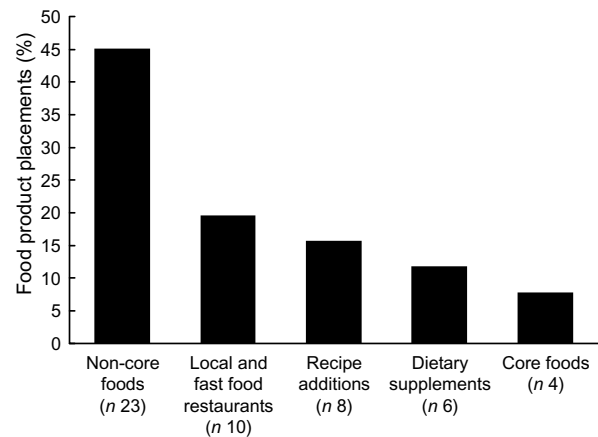


Fig. 3 Types of products advertised as product placements

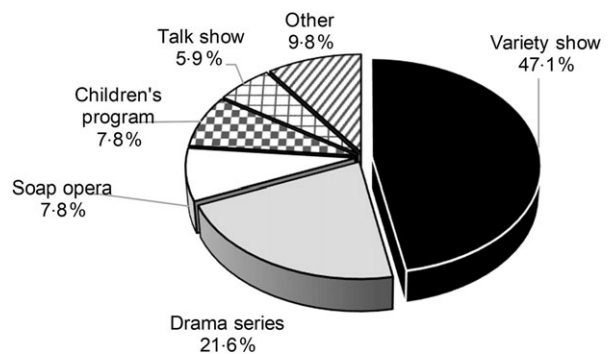


Fig. 4 Types of programs with product placements (*n* 51)

Discussion

This study examined the pattern of food advertising across television viewing periods and program categories and assessed the use of persuasive marketing techniques in food advertisements. Baby and toddler milk formula and dietary supplements were identified as two major product types being promoted on Hong Kong television. Regarding food categories, non-core products were the most frequently advertised (35.2% of food advertisements) in Hong Kong, which is in line with international studies^(19–24). The rate of non-core product advertising in Hong Kong was 2.3 advertisements per channel hour, which is lower than the reported global average of 3.4⁽²⁰⁾ and the Asia-Pacific average of 6.0⁽²²⁾. However, as the proportion of core product advertising in Hong Kong was quite low, the non-core product to core product advertising ratio (4.0:1) was higher than in the UK (2.9:1)⁽²⁰⁾ and South Korea (1.6:1)⁽³⁸⁾.

Quality of food advertised

The types of food products advertised in Hong Kong were, on the whole, unsatisfactory. According to the WHO, the

Table 3 Advertising strategies used in food product placements (*n* 51)

Advertising strategies	Product placement	
	<i>n</i>	%
No interactions with the product	28	54.9
Logos or text message addressing the brand name	14	27.5
Products prominently displayed or in the background, no direct interaction with the products	14	27.5
With interactions with the product	23	45.1
Interaction with the products (e.g., eating, using), no description of the products	9	17.6
Interaction with the products, description on the sensory based characteristics (taste, texture, appearance, aroma)	5	9.8
Interaction with the products, description of nutrient and other functional claims	0	0.0
Product promotion is included as one of the program sections	9	17.6
Product is being promoted throughout the program	0	0.0

food marketed to children is mainly high fat, sugar and salt products⁽³⁹⁾. Advertisements for high fat, sugar and salt food products were commonly found in Hong Kong's television commercials, such that fast food, chocolate and candy, sweets or high-fat savory biscuits and sugar-sweetened drinks were some of the leading food products being advertised. Owing to the high non-core product to core product ratio in Hong Kong, the quantity of non-core product advertising needs to be reviewed. In the meantime, the quality of core product advertising should also be studied. The most worrying finding is that there is a severe lack of vegetable and fruit advertisements in Hong Kong. In the 288 sample hours, vegetables and fruits were advertised only five times (0.26% of food advertisements). This proportion is much lower than the Asia-Pacific average (2%)⁽²²⁾. Hence, the nature and extent of food advertising must be regulated to reduce children's exposure to low-quality food in Hong Kong. The government must incorporate a scoring system, perhaps by referring to the UK's nutrient profiling model, in order to review and screen food product advertisements based on their quality.

Food advertising patterns across television viewing periods

Despite the consistent findings across the world^(19–24), we did not observe a higher rate of non-core food product advertising during the children's time slot. However, with a higher non-core to core product ratio and an overall increased food advertising rate during prime time, children in Hong Kong are exposed to considerably more non-core product advertising. This phenomenon is not unique to Hong Kong. In the UK, children were frequently exposed to non-core product advertising during prime time such that, in the worst case, nine non-core product advertisements were aired in half an hour⁽²⁸⁾. Worse still, researchers determined that children nowadays watch the most television during prime time, not the designated 'children's time slot'⁽²⁷⁾. Hence, when developing regulations on non-core food product advertising in Hong Kong, the focus must be on prime time. Simply borrowing regulations from other countries where the focus is largely on the children's time

slot will not prove effective in protecting children in Hong Kong from junk food advertising.

Persuasive marketing techniques in food advertising

Our results reflect that when it comes to food products, advertisers in Hong Kong utilise a different set of persuasive marketing techniques than advertisers in other countries. Techniques commonly used in non-core product advertising in other countries, such as promotional characters and premium offers^(19–24), are not frequently used in Hong Kong. Instead, non-core product advertising in Hong Kong emphasises sensory characteristics (e.g., appearance and taste) and emotive claims (e.g., having fun and happiness). It may be that the non-core food product advertisements in Hong Kong are not specifically aimed at children but the general television audience. When adults are part of their target group, food companies may reduce the use of cartoon characters in favour of more general and pleasant stimuli, such as visual elements, in their advertisements. However, unlike other countries where health claims are commonly used in non-core food product marketing⁽⁴⁰⁾, in Hong Kong, health claims (especially nutrient and other functional claims) are utilised mostly in baby and toddler milk formula advertising, as the purchase decision for these products relies heavily on their nutrition profile. This could also suggest that food companies believe that other features of their products, such as the sensory characteristics mentioned above, are more appealing to their target audience than health benefits.

Most advertised products in Hong Kong and the possible consequences of overwhelming advertising

A substantial number of advertisements for baby and toddler milk formula and dietary supplements were recorded in this study. Although these products are less influential to children, excessive advertising may lead to negative feedback. In 2013, infant and follow-up formula consumption volume in Hong Kong was 12.9 times higher than the average of high-income countries (19.9 kg per infant/child)⁽⁴¹⁾.



Although the data are considered to be greatly affected by cross-border purchases by mainland Chinese, in 2018, long after the regulation on export of powdered formula introduced in 2013, milk formula brands were still the top spending advertisers of TVB (which has a market share in TV broadcasting of over 85 %) (42). As nutritional benefits are usually emphasised while the strengths of breast milk are understated (43), researchers have found that overabundant infant formula advertising may convey the message that breast-feeding is not necessarily associated with desirable outcomes, thus reducing the number of women who breast-feed their infants (44). As per the latest survey, in Hong Kong in 2018, the exclusive breast-feeding rate for the first 6 months was 26.3 % (45), much lower than the global average of 38 % and the WHO target of 50 % (46,47). Considering the potential link between breast-feeding and reduced risk of childhood obesity indicated in systematic reviews (48,49), in 2017, in an effort to improve breast-feeding rates, the voluntary 'Hong Kong Code' was implemented. According to this code, which aims to 'protect breast-feeding and contribute to the provision of safe and adequate nutrition for infants and young children, based on adequate and unbiased information and through appropriate marketing' (50), milk formula for children under 36 months old cannot be promoted on television. Our results showed that the code was breached by many baby and toddler milk formula manufacturers, suggesting the abidance to the voluntary code was low. Although we determined that it was mostly advertisements of stage 4 milk formula that were aired during the study period, the images of happy and intelligent kids under 3 years old may still persuade mothers to choose formula over breast milk. The high repetition rate and overwhelming health claims in baby milk formula advertising, which lie outside the scope of the Hong Kong Code, may have an excessively negative impact on mothers' confidence in breast-feeding (44).

Meanwhile, there is a paucity of breast-feeding support policies in Hong Kong. Although the government is considering introducing regulations prohibiting discrimination against public breast-feeding, they cannot protect mothers from harassment. Worse still, spaces and equipment aiding breast-feeding are insufficient in both offices and public areas in Hong Kong as they are not required by law. Therefore, to improve the exclusive breast-feeding rate, the government should implement mandatory regulations for employers to provide secure and well-equipped environments for breast-feeding.

Health products containing Chinese herbs are another culturally specific food type being heavily promoted in Hong Kong. Herb-containing products were not considered as food according to the INFORMAS protocol; however, these products were captured from time to time throughout the study. Thus, the television audience is actually being exposed to numerous dietary supplements containing pharmaceutical or Chinese herbal ingredients. Some of the products may not fulfill their functional claims

while the general public may misunderstand the claims and their own needs. At present, there are no specific regulations on dietary supplements. Even the very definition of what constitutes a 'dietary supplement' is ambiguous; the concept is a mixture of food and drugs. The government should, thus, clarify what constitutes a 'dietary supplement' and restrict the related advertisements before misleading advertising poses a health risk to consumers.

Food product placements in Hong Kong

In Hong Kong, the food products used for placements are even healthier than those directly advertised in commercials: over 80 % of product placements in programs are for non-core products, local and fast food restaurants and recipe additions (oil and sauce). The majority of non-core product placements in Hong Kong are included in variety shows and series, which are not specifically aimed at school-age children. This is a unique finding when compared with the UK and Ireland, where fast food and sugar-sweetened beverages were mainly incorporated into teen programs (51). Therefore, assessing the quality, not quantity, of food product placement in Hong Kong may be important when assessing persuasive power. Over a quarter of food product placements in Hong Kong involve no direct interaction with the product, but the exposure rate is indeed very high. Repeated exposure of the same product makes the product placement more impressive. Besides, half of the food product placements involved interactions with the products, such that familiar program settings would strengthen the recall effect, making consumers more willing to choose the products (16–18). Although the direct effect of food product placement on childhood obesity is yet to be investigated, taking the persuasiveness of product placement into account, non-core food product placement, which cannot be easily avoided, can have far-reaching repercussions on health. Therefore, the government should not further loosen the regulations on food product placement but control the quality and quantity of food product placement in television programs (especially variety, series and soap opera).

Limitations

The methodological problems in the research design limit our interpretations. The validity and repeatability of the results are potentially affected by the single rater's background knowledge. Moreover, our exploratory study included only eight nonconsecutive days from October 2018 to January 2019 in the dataset. As children's vacation period and some seasonal variations in advertising were missed, the generalisability of our findings is limited.

Future directions

As a Western protocol may not accurately reflect the Hong Kong scenario with regard to advertisement types and persuasive marketing techniques, a more culturally specific



coding system must be developed. As program preview is surprisingly found as a major advertisement type in Hong Kong during the study, future research should include program previews involving scenes featuring a substantial amount of cooking or eating as food advertisements.

Given our observation of frequent breaches to the voluntary Hong Kong Code, its effectiveness should be formally evaluated, for example, via annual audits of the number of breaches to confirm changes in baby and toddler milk formula promotion practice, or lack thereof. Studies investigating the effectiveness of visual and audible messages during baby milk formula advertisements to remind consumers that breast-feeding is the preferred feeding mode should also be conducted. Information gathered from these studies will provide the government with a strong evidence base to support further expansion of its efforts in promoting breast-feeding in Hong Kong via legislation (e.g., a total ban of formula milk promotions) and other strategies.

Determining whether Chinese (or Korean) herbal ingredients should be classified as drugs or dietary supplements is also required. This study could not fully assess the nature and extent of product placement because of the difficulty in quantifying the occurrence of products. Instead, the duration of food product placement can be assessed in future studies. Moving away from free-to-air television, advertisements on new platforms could also be studied. Owing to the shortened product life cycle, the present situation in Hong Kong is such that there are fewer advertisements on television, with companies trying to promote their products on social media platforms or video sharing websites, which allow a shorter promotion period. Moreover, the new generation in Hong Kong is more fascinated with social media and online videos, such that children and teenagers could face greater exposure to advertising on these platforms than on television. Future studies should, therefore, examine the nature and extent of non-core food product advertising on social media platforms or video sharing websites.

Conclusion

The overall results indicate that non-core products, such as fast food, candy or soda, are the most advertised food category in Hong Kong in both commercials and product placements, and core product advertising is noteworthy low. In contrast to existing research from other countries, the highest non-core product to core product ratio was found during prime time but not the children's time slot. Therefore, instead of focusing on just the children's time slot, non-core food advertising during prime time should also be regulated. The worryingly unhealthy nature of food product placements observed in this study suggests that this new marketing strategy should not be ignored in non-core food marketing policy development. The

substantial number of advertisements for baby and toddler milk formula observed in this study suggests that the voluntary advertising code was not abided by all manufacturers, and a total ban of the promotion of these products may be required to shield new parents from the exposure of milk formula promotions.

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Supplementary material

For supplementary material accompanying this paper visit <https://doi.org/10.1017/S1368980020000907>

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