



Research report

Nutritional quality of foods marketed to children in Honduras[☆]Matthew D. Gunderson^{a,b}, Dennis Clements^{b,c}, Sara E. Benjamin Neelon^{b,c,d,*}^a University of Utah School of Medicine, 30 North 1900 East, Salt Lake City, UT 84132, USA^b Duke Global Health Institute, Trent Hall, 310 Trent Dr, Durham, NC 27710, USA^c Department of Pediatrics, Duke University Medical Center, T901/Children's Health Center, DUMC 3352, Durham, NC 27710, USA^d Department of Community and Family Medicine, Duke University Medical Center, 2200 W Main St, DUMC 104006, Durham, NC 27705, USA

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ABSTRACT

Evidence suggests that exposure to advertising of unhealthy foods may contribute to increased rates of obesity in children. This study examined the extent to which television stations marketed unhealthy foods to children during after-school programming aired over one week in La Ceiba, Honduras. Content analysis was performed on four television stations, including one broadcast station and three cable networks. Eighty hours of programming were recorded and analyzed. Advertised products were categorized as food or non-food items, with food items further classified as healthy or unhealthy. Advertisements were coded as those aimed at children, adults, or both, and chi-square tests were used to compare the proportion of unhealthy advertisements by target audience. A total of 2271 advertisements aired during the observation period, with 1120 marketing products (49.3%). Of those, 397 (35.4%) promoted foods—30.2% were for healthy foods and 69.8% for unhealthy foods. The unhealthy foods were all advertised on cable networks and not the broadcast station. Children appeared to be targeted more than adults in advertisements for unhealthy foods (92.1%, $p < 0.001$). Cable television programming during after-school hours advertised primarily unhealthy foods. Exposure to these advertisements may promote consumption of unhealthy foods by children, increasing their risk of obesity.

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Introduction

Food marketing has a powerful impact on the eating habits of children (Andreyeva, Kelly, & Harris, 2011; Boyland & Halford, 2013; Harris et al., 2009; Kaiser Family Foundation, 2004; Roberto et al., 2010; Veerman, Van Beeck, Barendregdt, & Mackenbach, 2009). Studies have shown that children as young as three years of age are able to identify commercials during television programming; however, most children do not fully understand the persuasive intent of such advertising (Graff, Kunkel, & Mermin, 2012). Further, both children and their parents can establish preferences for certain products with as little as a single commercial exposure, and such predilections are strengthened by repeated exposures (Kunkel et al., 2004; Pettigrew et al., 2013). These preferences, in turn, affect children's requests and ultimately parents' purchases

of food products (Andreyeva et al., 2011; Costa, Horta, & dos Santos, 2012; Díaz Ramírez, Souto-Gallardo, Bacardí Gascón, & Jiménez-Cruz, 2011; Institute of Medicine, 2006). It is notable that the majority of studies examining food advertising to children have been conducted in high-income countries. However, similar effects are seen in both developed and developing nations, and food marketing of unhealthy foods to children has become a global issue (Guran & Bereket, 2011; Kelly et al., 2010). The food industry is now targeting a worldwide market, partnering with global advertising agencies to market their food and beverage products to low- and middle-income countries (Hawkes, 2002; Hawkes, 2006). Gupta and colleagues cite advertising by transnational food companies as one of the most important determinants of childhood obesity in low-income countries (Gupta, Goel, Shah, & Misra, 2012). Cecchini et al. contend that restricting marketing of unhealthy foods to children is an effective method for reducing obesity in the developing world (Cecchini et al., 2010). Nearly a decade ago, the World Health Organization released its *Global Strategy on Diet, Physical Activity and Health* (2004), calling on governments to regulate food marketing of unhealthy foods to children. However, global marketing of unhealthy foods appears to be rising (Guran & Bereket, 2011; Harris, Pomeranz, Lobstein, & Brownell, 2009; Hawkes, 2007; Kelly et al., 2010).

Abbreviation: US, United States.

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Rates of childhood obesity are also increasing globally, especially in Latin America (Ogden et al., 2010; Wang & Lim, 2012; Wang & Lobstein, 2006). Much of the research evaluating food marketing in Latin America, however, has focused on programming targeting children in Mexico or Spanish-speaking children on the border between the United States (U.S.) and Mexico. In 2007, Thompson and colleagues analyzed two national Spanish-language television stations in the U.S. (Telemundo and Univision) during typical after-school hours. They found that a large number of commercials for food and drinks were aired during that time, most of which were deemed to be unhealthy (Thompson, Flores, Ebel, & Christakis, 2008). In 2011, Barroso and colleagues evaluated English- and Spanish-language television networks along the Texas-Mexico border (Barroso, Rodriguez, & Camacho, 2011). They focused on Saturday morning programming, and also found that many food advertisements promoted consumption of foods of poor nutritional quality. Of note, Barroso and colleagues commented that children in Texas and Mexico are exposed to many advertisements that encourage further viewing of television – and thus more sedentary behavior (Barroso et al., 2011).

Kunkel, Mastro, Ortiz, and McKinley (2013) analyzed advertisements aired during 158 Spanish-language children's television programs and compared them to English-language programming in the U.S. The authors found that the prevalence of food-related advertisements was lower during Spanish-language programming, but the nutritional quality of the foods and beverages marketed was considerably poorer (Kunkel et al., 2013). A large study in Mexico in 2009 came to similar conclusions, analyzing five stations on both weekday afternoons and weekend mornings. The researchers found that children were systematically more exposed than adults to advertisements for unhealthy foods (Ramírez-Ley et al., 2009). The authors stated that food-related advertising in Mexico was similar to that in the U.S., and suggested that the food industry was acting against federal laws recently enacted to limit such marketing in Mexico (Ramírez-Ley et al., 2009). Bell and colleagues reviewed advertisements aired on twelve U.S. networks, including Spanish-language networks, during after-school and Saturday morning hours. They found that 25% of commercials advertised food, and that three quarters of these advertisements were for foods high in fat or sugar. Just over 25% of these advertisements were marketing fast-food restaurants, especially on the Spanish-language networks (Bell, Cassady, Culp, & Alcalay, 2009).

These studies suggest that food advertising to Spanish-speaking children is prevalent and may promote less healthy foods, but little is known about such marketing in Honduras. Moreover, previous studies have not assessed the extent to which advertisements differ on broadcast compared to cable television stations. The purpose of this study was to categorize the nutritional quality of foods and beverages depicted in television commercials aired during children's after-school programming in Honduras and assess the proportion of advertisements targeting children.

Materials and methods

Television stations

The study was performed in the city of La Ceiba, on the Northern Coast of Honduras. With a population of roughly 150,000 people, it is the third-largest city in Honduras. This location was chosen because it offered complete access to all television programming broadcast across Honduras. Television stations are located in either Tegucigalpa, the national capital in the southern part of the country, or San Pedro Sula, the industrial center in the western region. The city of La Ceiba receives all broadcasting from both cities. Telecadena is the only public-access television station

that broadcasts a full block of programming every weekday that specifically targets school-age children. Thus, Telecadena was the only broadcast station considered in this study. Three cable stations were also included in this study: the Disney Channel (Disney Enterprises, Inc.), Nickelodeon (Viacom and operated under Nickelodeon Kids and Family Group), and the Cartoon Network (Turner Broadcasting). These stations were chosen based on viewership – they represent the three most watched cable networks in Central America, according to ratings released in February of 2012 by the Instituto Brasileiro de Opinião Pública e Estatística (IBOPE, Brazilian Institute of Public Opinion and Statistics) (Brazilian Institute of Public Opinion, 2012). All stations broadcast their programming in Spanish. As this research did not involve human subjects, *The Code of Ethics of the World Medical Association* for experiments involving human subjects did not apply. Duke University granted a waiver for ethical approval for this study.

Data collection

Data collection took place in May and June of 2012. Each television station's programming was observed for an entire week, Monday through Friday. Weekend television programming was not considered in this study because broadcast programming in Honduras does not specifically target children at those times—their primary focus is in after-school weekday hours. Live broadcasts of programming were viewed and recorded as digital video files each day from 1:30 pm to 5:30 pm. Exactly 20 h were recorded each week, yielding an overall total of 80 h of observation throughout the study, spread equally over the four stations of interest. Recording times were chosen to best represent typical after-school hours for most children in Honduras. While there are several different school schedules in Honduras, the most common school hours are 7:00 or 7:30 am until noon. In an effort to serve more students, some public schools offer a second shift of classes from 12:30 or 1:00 pm until 5:00 pm. However, the morning schedule is most common for the majority of students. Given our research goal of comparing broadcast to cable television programming, these hours represent the time period that children would be most likely to watch television and thus be exposed to unhealthy food advertisements.

Review and coding of television advertisements

Video recordings of television programming were reviewed by two coders in July and August of 2012. Each coder reviewed and analyzed all advertisements independently. Thus, all advertisements were double-coded. Initial coding was performed by an investigator on site in Honduras. A research assistant performed a second, independent content analysis, viewing the digital video files via the internet in the U.S. Both were fluent in Spanish, but not native language speakers. We calculated inter-rater reliability and found an initial agreement of 93.9% between the two coders. The majority of discrepancies (123 of 145) involved differentiating between station identification and promotional messages for television programming. All discrepancies were discussed among the research team, with final coding reconciled with the senior author.

First, television content was classified as programs (i.e., shows) and non-programs. Non-programs included promotion of station programming, station identification, public service announcements, and product advertisements. Advertisements were coded using a protocol established by Thompson et al. (2008). Brief sponsorship messages, such as “this program was brought to you by product X”, were considered product advertisements. Product advertisements were further divided as advertisements for food or non-food items. Food-related advertisements were defined as commercials that promoted the purchase or consumption of foods or beverages, including dietary supplements. Food items were

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