



Do healthy, child-friendly fruit and vegetable snacks appeal to consumers? A field study exploring adults' perceptions and purchase intentions



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ARTICLE INFO

Article history:

Received 10 February 2014

Received in revised form 27 June 2014

Accepted 20 July 2014

Available online 27 July 2014

Keywords:

Food shape

Fruit

Vegetables

Parents

Children

Child-friendly

ABSTRACT

The majority of children in the U.S. do not consume enough fruits and vegetables (FV). Children's liking of and preferences for FV are consistent predictors of intake, as are factors such as availability and accessibility, which are largely under the control of parents and caregivers. This study was designed to examine parents' and caregivers' current purchasing habits regarding child-friendly (CF)-shaped foods and pre-cut produce; determine their sensory perceptions of CF-shaped vs. regular-shaped pre-cut FV; and, to ascertain their willingness to pay slightly more for CF-shaped FV compared to fresh, whole produce. Healthy, CF-shaped fruit and vegetable snacks were developed by cutting FV into CF shapes (butterfly, chick, flower, teddy bear). Participants ($n = 298$) were adults, the majority of whom (66.1%) reported having children at home. Participants who reported having children at home consistently recognized CF-shaped fruit and vegetable samples as CF-shaped foods, while 64.4% of participants with children at home perceived regular-shaped pre-cut fruit and vegetable samples as CF-shaped foods. Participants rated CF-shaped samples as more visually appealing than regular-shaped samples, ($p < 0.0001$) and were 34% more likely to select CF-shaped samples. Female gender, the presence of children in the home, and frequent self-reported purchase of pre-cut produce were also significant positive predictors of visual appeal. Taste and texture ratings were not consistently significantly higher for CF-shaped fruit and vegetable samples. CF shape predicted higher willingness to pay extra for the fruit and vegetable product ($p = 0.0057$), as did frequent purchase of pre-cut produce and CF-shaped foods. Adults, particularly females and individuals with children in the household, find CF-shaped FV highly visually appealing and are willing to pay slightly more for these foods. Healthy, ready-to-eat, CF-shaped fruit and vegetable snacks may be a promising marketing strategy to help increase fruit and vegetable intake among children.

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Introduction

The majority of children in the U.S. consume inadequate quantities of fruits and vegetables (Krebs-Smith, Guenther, Subar, Kirkpatrick, & Dodd, 2010; United States Department of

Agriculture & Human Services, 2010). Patterns of low fruit and vegetable intake begin at a young age and the disparity between children's actual intake of fruits and vegetables and recommended intake levels increases progressively after the toddler years (Krebs-Smith et al., 2010; United States Department of Agriculture & Human Services, 2010). Fruit and vegetable intake patterns have been shown to track from childhood into adolescence (Ambrosini, Emmett, Northstone, & Jebb, 2014) and from adolescence into adulthood (Lien, Lytle, & Klepp, 2001). Therefore, establishing healthy fruit and vegetable intake patterns in early childhood is vitally important if children are to meet and maintain the recommended levels of intake set forth by the Dietary Guidelines for Americans (DGA) (United States Department of

Abbreviations: CF, child-friendly; FV, fruits and vegetables.

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Agriculture & Human Services, 2010; United States Department of Agriculture., 2009).

A number of studies and methodological reviews have been conducted to examine the determinants of fruit and vegetable intake in children (Baxter & Thompson, 2002; Reinaerts, de Nooijer, Candel, & de Vries, 2007; Resnicow et al., 1997; Zabinski et al., 2006). In a two-part review of quantitative and qualitative studies Krolner et al. and Rasmussen et al. report that the factors most widely associated with fruit and vegetable intake in children 6–18 years of age are: children's preferences; parents' intake levels; availability/accessibility of FV in the home; time (e.g., time required for preparation); sensory properties (appearance, smell, taste and texture); children's fruit and vegetable preparation skills; cost; and, convenience (e.g., ready-to-eat FV vs. those requiring preparation) (Krolner et al., 2011; Rasmussen et al., 2006). In the marketplace, a multitude of highly palatable, convenient foods that require little or no preparation are targeted specifically to a child audience through the use of fun names, front-of-package characters (e.g., animals, popular cartoon personalities), artificially enhanced colors, and the food itself being offered in child-friendly (CF) shapes, (e.g., animal crackers, fruit-shaped gummies and dinosaur-shaped chicken nuggets) (Elliott, 2008). Unfortunately, the majority of these foods are high in fat, sugar and/or sodium. With the exception of baby carrots and small apples, Elliot et al. identified no produce items that were similarly targeted to children (Elliott, 2008). This reality begs the question of why highly successful child-targeted marketing techniques and knowledge of the determinants of children's fruit and vegetable intake are not being integrated and used to market FV to children and parents in an effort to improve consumption levels.

A small number of research studies exploring fruit and vegetable promotion have employed techniques similar to those utilized in the marketplace, offering "fun", ready-to-eat fruit and vegetable snacks such as star-shaped fresh-cut vegetables, vegetables with names like "X-ray vision carrots", or visually appealing arrangements of fresh fruit (Jansen, Mulken, & Jansen, 2010; Olsen, Ritz, Kramer, & Moller, 2012; Wansink, Just, Payne, & Klinger, 2012). These authors report that children preferred fun-shaped to regular-shaped vegetables (Olsen et al., 2012), selected vegetables twice as often when they had fun names (e.g., in the school lunch line) (Wansink et al., 2012) and increased their intake of fruits and vegetables by 85% or more (Jansen et al., 2010; Wansink et al., 2012).

Parents and caregivers (hereafter referred to as parents) play important roles in influencing children's fruit and vegetable intake. Parents' modeling of fruit and vegetable consumption is a key determinant of children's intake (Rasmussen et al., 2006). Parents also determine the availability and accessibility of FV in the home by managing the purchasing, preparation and provision of foods, (especially for younger children). Not only do factors such as time, convenience, and cost play direct roles in influencing children's intake of FV by affecting children's self-directed intake behaviors, they also influence parents' decisions to purchase and serve FV, and thus determine the availability of FV (Glanz, Basil, Maibach, Goldberg, & Snyder, 1998). American's purchasing habits increasingly favor convenient, ready-to-eat foods. For example, sales of pre-cut produce and packaged salads increased from 1% of total produce department sales in 1987 to 15% in 1997 (Dimitri, Tegene, & Kaufman, 2003). Pre-cut produce sales were transiently negatively affected by the recent economic recession but display renewed signs of growth; average prepared vegetable sales rose by 34.8% from 2005 to 2010 and were followed closely by prepared fruit sales (23.3% increase) (Padera, 2010; The Perishables Group., 2012). Market research suggests that 26% of consumers purchase pre-cut FV due to the convenience of these items and 20% of consumers would like to see more ready-to-eat single-serve fruit and

vegetable offerings become available on the market (Levesque, 2013). In light of these facts, conveniently packaged pre-cut fruit and vegetable options that are CF are likely to be attractive options for parents who wish to provide healthy foods for their children yet have limited time for fruit and vegetable preparation.

To date, there has been a gap in the scientific literature regarding the role CF marketing strategies play in influencing children's liking of FV and parents' purchasing decisions. To begin to meet this research need, we explored consumer attitudes toward CF-shaped FV from the child and adult perspectives. This paper focuses on the results of the adult consumer behavior survey; specifically, parents' attitudes and purchasing habits regarding CF-shaped foods and pre-cut produce and their sensory evaluation of CF- compared to regular-shaped fruit and vegetable samples. Child-focused data are reported elsewhere. It was hypothesized that parents would:

- (a) Recognize CF-shaped FV as being CF foods.
- (b) Rate the sensory properties (appearance, taste, texture) of CF-shaped FV as high or higher than regular-shaped FV.
- (c) Be willing to pay a slightly higher price for CF-shaped produce as compared to fresh, whole produce options currently available in stores.

Material and methods

This study was determined to be exempt from review by the Institutional Review Board at Purdue University.

Study sample

A convenience sample of 298 participants was recruited at a local mall and two large grocery stores in an urban location in Northwestern Indiana. The researchers set up a table at each data collection site comprised of two, side-by-side interviewing stations and samples of the study foods. At the mall location, the table was set up next to the children's play area and parents were actively invited to participate; at all locations any passerby who demonstrated interest was invited to participate. Study participants consisted primarily of parents and children, but also included adults without children. For the purposes of this paper, only adult participant data are reported, with the exception of data on the number of food samples that were offered and selected (this information was collected in aggregate for all participants). Informed consent was obtained verbally prior to participation.

Survey design

A Qualtrics® consumer behavior and opinion survey was developed for use at research sites with Internet access and an identically worded paper version of this survey was used at data collection sites without Internet access. All researchers who administered surveys to study participants were trained prior to the start of data collection to ensure adherence to standard procedures to limit interviewer-based bias. Survey response scales were explained to the participants before they began the survey. Responses that required the participant to rate their level of agreement with a statement were recorded on a 7-point Likert-type scale, with 1 anchored at "strongly disagree" and 7 anchored at "strongly agree". A visual example of a 7-point rating scale was provided for each participant's reference while answering the survey questions. All survey questions were read aloud to the participants and all responses were recorded by the researchers.

Participants' gender was recorded and the researchers visually estimated subjects' body mass index (BMI) weight range, (underweight, healthy weight, overweight, or obese). Participants

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