



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

*No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.*

## **Promoting Healthful Foods: Could Water be the Answer?**

T. Bettina Cornwell, University of Oregon

Anna R. McAlister, Michigan State University

Food consumption choice rather than simply food consumption knowledge is now considered important in better understanding the unfolding obesity epidemic. In this paper, cross-disciplinary research examines food and drink combining. A survey-based pilot study examines the food and drink pairing preferences of young adults and shows strong preferences exist. A laboratory study with young children finds food consumption is not influenced by the child's fussiness but is influenced by the drink accompaniment. Both palate preference and associative learning are explored as mechanisms driving the effects of drink context on food consumption.

## **Cross-Disciplinary Work on Health Promotion**

The obesity epidemic has social, political, and scientific center stage as people, communities, and countries grapple to find policies that might reverse devastating trends. For hugely important and seemingly intractable topics, such as obesity is today, policy needs silo-bridging work. Research in traditional areas of health promotion often points to the role that marketing plays in food preference and choice (Aldridge, Dovey, and Halford 2009) but does not examine it deeply. There is a need for marketing academics and practitioners to understand the ways in which promotional efforts contribute to the epidemic. New studies such as Sharpe and Staelin's (2010) work on food bundles and meal deals exemplify the potential for policy to be informed by marketing variables. The current work seeks to contribute to this cross-disciplinary stream by further examining food and drink combining.

Meal deal "combos" and paired bundles of food products have been investigated to determine the extent to which the individual items are more or less likely to sell when presented in a bundle than when offered alone. Generally speaking, food and drink items are valued more highly (Venkatesh and Kamakura 2003) and consumed in greater amounts (Stremersch and Tellis 2002) when offered as part of a bundle. Recently, researchers have expressed concern that the familiar combo meal (i.e., soda and fries paired with an entrée) not only inflates caloric intake but also threatens the potential efficacy of proposed policy interventions. For example, Sharpe and Staelin (2010) argue that proposed soda taxes may have little effect on reducing overall caloric intake when bundles incorporating soda remain available.

Food/drink bundles are pervasive and their consumption is prevalent (Schlosser 2001). Consumption of combo meals often begins early in life, with most children having consumed a combo meal (typically soda, fries, and burger) by age three or four (Schlosser 2001). We

acknowledge not all consumers visit fast food restaurants, however, bundled foods and suggestions for food combining are not uncommon elsewhere. For example, grocery stores provide parents with options such as Lunchables targeted for children. Lunchables combos offered in the US include, for example, the Turkey + Cheddar Sub (turkey and cheddar on a wholegrain sub, packaged with wafers, spring water, and tropical punch Kool-Aid singles) or as an alternative, the Lower Fat Turkey and Cheddar Cracker Stackers (turkey and cheddar packaged with crackers and including a Capri Sun and fat free chocolate pudding). In response to concerns over obesity, Lunchables in the UK as of 2004, no longer contain Capri Sun.

In various other contexts, consumers are further socialized to expect that particular goods are delivered in combination. For instance, gas stations and convenience stores regularly offer discounts when a soda and chocolate bar are purchased in combination. Bundling soda and chocolate may inadvertently “teach” consumers to consume chocolate and soda in combination. Whether it be through palate training or through other psychological mechanisms, we may come to anticipate these items in combination and purchase them together even after the promotional effort has ended. As an example, increased consumption of Coke with breakfast has been credited to a late 1980s campaign that suggested “I need a Coke in the morning” (Schmeltzer 2007). Of interest in the present research, is the notion that the seemingly pervasive practice of bundling particular “types” of food and drink may habituate individuals to the complementary tastes of the paired items. Over time, this habituation may lead consumers to feel that one item tastes better with the other, incomplete on its own, and also incomplete when paired with other complements that do not provide the anticipated taste combination. By way of illustration, we suggest that a person who regularly consumes cola with a burger may develop a liking for the taste of these items together. Over time, a burger on its own may seem less appealing and the

same burger paired with a different drink (e.g., orange juice) may not be as satisfying.

Taste habituation, if it were observed as described here, would hold important implications not only in the marketplace but also in consumer planned consumption. For example, if the individual whose experience with the burger/cola combo in a fast-food restaurant trains him/her to anticipate the taste of a burger when s/he consumes cola, then that consumer may seek a similar entrée when consuming a glass of cola at home. The development of taste preference that favors food and drink combining might drive decision-making but an alternative explanation for some combination tendencies might be associative learning (De Houwer, Thomas, and Baeyens 2001) or even cueing (Gall et al. 1987). Associative learning would suggest that past experiences with combinations lead to expectations about fitting and liked combinations whereas cueing theory would suggest that the presence of one cue such as cola makes the person think of its savory accompaniment or visa versa. Before further examination, the cliché of combining behaviors needs to be documented as a pervasive tendency.

The present research includes a pilot study and lab work. The purpose of the pilot study is to establish the extent to which stereotypical food combinations are prevalent. As indicated above, we anticipate that marketplace offerings will have instilled in consumers an expectation that particular food and drink items belong together. Hence, we predict that adults will agree that certain combinations make sense, while other food/drink pairings will be perceived as “wrong.”

### **Pilot Study**

A short survey was designed to explore expectations regarding acceptable food/drink. Following IRB approval, students at a large state school were asked to participate. As part of a larger study, 60 participants responded to questions about their food preferences. A five-point scale was used to record responses (1 = disagree; 5 = agree). Results are detailed in Table 1.

TABLE 1  
PARTICIPANTS' AGREEMENT WITH VARIOUS FOOD/DRINK PAIRINGS

Item	M	SD
French fries go well with a cola beverage such as Coke, a flavored soda, or Fanta.	4.20	.93
Pizza goes well with a cola beverage such as Coke, a flavored soda, or Fanta.	4.17	1.06
Raw vegetables such as carrot or celery sticks go well with tap water or plain bottled water.	4.15	1.14
Pizza goes well with tap water or plain bottled water.	3.51	1.08
Steamed vegetables such as asparagus and broccoli go well with tap water or plain bottled water.	3.20	1.38
French fries go well with tap water or plain bottled water.	2.86	1.11
Steamed vegetables such as asparagus and broccoli go well with a cola beverage such as Coke, a flavored soda, or Fanta.	1.93	.96
Raw vegetables such as carrot and celery sticks go well with a cola beverage such as Coke, a flavored soda, or Fanta.	1.83	.84

Participants' strongest feelings pertained to foods paired with soda. Highest agreement was observed when soda was paired with French fries ( $M = 4.20$ ,  $SD = .93$ ) or with pizza ( $M = 4.17$ ,  $SD = 1.06$ ). By contrast, participants disagreed with soda being a suitable complement to raw or cooked vegetables ( $M_s = 1.83$  and  $1.93$ , respectively). On the other hand, plain water received mostly average ratings, indicating that it was a reasonable complement to most foods.

The finding that participants were more accepting of pairings of high-calorie foods and soda is consistent with our expectations. Fast food restaurants frequently pair these items in their bundles. Hence, our young adult participants may have learned that these make sense as complements to be consumed in combination. Since vegetables (raw or cooked) are infrequently

bundled with soda, this combination is arguably unfamiliar and therefore less readily accepted by our survey participants. Our next question, then, is to determine whether there is an arising preference or disinclination for food that stems from the drink context. The public policy concern regarding soda and sweetened beverages may, as the pilot study and past research show, extend beyond a basic concern about choice to a more complex concern about bundling and contingent choice. Young children are consumers who are relatively inexperienced in food choice and combining and less familiar with marketplace offerings. Thus, their responses to food and drink pairings may not necessarily align with typical market offerings or cultural expectations.

### **Lab Study of Children's Taste Preferences**

The lab study examines children's acceptance of raw vegetables as a snack paired with either a sweetened beverage or with plain water. It builds on the pilot study findings by using measures of actual physical consumption, rather than a survey measure of acceptance of various combinations. Children are the population of interest not only because of their limited experience with out-of-home foods, but also because there is a need to understand how preferences are developed at a young age. Interventions targeting dietary change may be more effective with younger participants (McAlister and Cornwell 2010). Hence, we are interested in learning about conditions that might influence consumption among very young children. Though type of beverage (sweet drink vs. water) is our key variable of interest, our design accounts for the fact that, among preschool children, food fussiness may be a strong predictor of food acceptance.

Research on the development of taste preferences finds repeatedly that children prefer sweet and salty tastes (see Wardle and Cooke 2008). Fewer studies document a preference for sour tastes in children (Blossfeld et al. 2007; Liem and Mennella 2003). While the taste contribution of fat has not been as frequently studied in children; in animal studies, the

enhancing nature of fat when combined with sucrose results in avid consumption (Naleid et al. 2008). Importantly for our research, established food preferences in childhood influence food choice over the lifespan and have both short- and long-term health consequences (Kemmer 1987).

Northstone et al. (2005) used multivariate analysis on a large-scale survey in the UK to examine diets of families with children at age four and again when seven. Using principal components analysis, three dietary patterns were established cross-sectionally: a diet based on “junk-type foods” having high sugar and fat from processing; a “traditional” diet based on meat, potatoes, and vegetables; and a “health conscious” diet associated with vegetarian foods, rice, pasta, salad, and fruit consumption. Children with the “junk” diet showed increased difficulties with feeding or being a “difficult eater” as compared to those in the traditional and healthy patterns. Since the research was correlational, there was no discussion of causality. Thus, it may be that having a difficult eater is likely to result in a parent offering junk food to encourage a child to eat or, alternatively, it may be that having a junk food dietary pattern results in parents reporting difficulties with feeding a child. This research finding opens a question: is the picky, fussy or difficult eater being developed through their food exposure patterns? Importantly for this research, it suggests that fussiness is a variable to consider with young children.

Though the study of preschool children allows for an examination of relatively inexperienced consumers, we emphasize that children are not devoid of exposure to marketing. Hence, we include an assessment of children’s brand knowledge and question the extent to which fussiness regarding food is related to brand knowledge. Our selected brand knowledge instrument assesses children’s memory for the information to which they have been exposed. It is arguably a more meaningful measure than exposure because it rests on children’s attention to brand information and their incorporation of the information into their memory system.

The main hypotheses addressed in this study are as follows:

H1: Fussiness regarding eating will be related to brand knowledge. Children with higher brand knowledge scores will score higher on the fussiness scale.

H2: There will be a significant negative relationship between fussiness and children's acceptance of vegetables. Children with higher fussiness scores will consume smaller amounts of vegetables than children with lower fussiness scores.

From the pilot study, we found strong inclinations against the pairing of soft drinks with cooked or raw vegetables. While children are expected to hold fewer associations between food and drink, naturally arising preferences from exposure may also influence choice.

H3: There will be a significant relationship between type of beverage (sweetened drink vs. water) and children's acceptance of vegetables. Children will consume a smaller amount of vegetables on the sweet drink taste trial than on the water trial.

## **Method**

### **Participants**

Following IRB approval, consent was obtained to work with 75 children (40 boys, 35 girls) aged 3y6m to 5y3m ( $M = 4y6m$ ,  $SD = 6m$ ). One parent of each child was asked to participate in a brief survey. Survey responses were obtained from 52 parents. Families were recruited from a middle class preschool.

### **Materials and Procedure**

Parents completed a survey regarding their child's TV viewing habits, fussiness regarding eating, and exposure to various foods. Children took part in a collage task to assess brand knowledge, as well as a taste-sampling task. Each of the child activities was conducted one-on-one in a quiet room at the preschool. Each child was seen on three separate occasions (once for

the brand knowledge task, and twice for the separate taste-test trials).

*Child's TV viewing habits.* Parents were asked to record the number of (a) supervised and (b) unsupervised hours per week their child spends viewing commercial TV.

*Child's fussiness with eating.* The survey also used seven items for parents to rate their child's fussiness with eating (e.g., "My child is afraid to eat things s/he has never had before."). These items were adapted from Pliner's (1994) Food Neophobia Scale and included two reverse-coded items (e.g., "My child will eat almost anything."). Responses to fussiness items were recorded on a five-point scale (1 = strongly disagree, 5 = strongly agree). The fussiness scale showed high internal consistency ( $\alpha = .92$ ). Hence, a fussiness scale score was calculated for each child by averaging across the seven items. Note that two teachers also completed this section of the survey for each child. Teacher and parent ratings were highly correlated, indicating that parents were honest in reports regarding their children. Parent data are used in the analyses.

*Child's frequency of exposure to various foods.* Parents were asked to report, on average, how many times per week their child was served each of the following foods: raw red bell pepper; water as the only drink with a meal; Cheese Nips, Goldfish or similar; raw mini carrots or carrot sticks; Hawaiian Punch with a meal; Oreo, Chips Ahoy or similar; Hawaiian Punch Lite or other artificially sweetened beverage; celery sticks; soda or pop; grapes (green, red or purple); "fast food." These food and drink items were selected to represent a variety of foods that might typically be served to young children. Of particular interest were the items relating to red peppers, carrot sticks, Hawaiian Punch, and water, since these are the food and drink items used in the taste test with the child participants.

*Child brand knowledge.* Children's knowledge of various brands was assessed using a four-trial collage task borrowed from McAlister and Cornwell (2010). Each trial assessed

knowledge of brands from different product categories (i.e., soda, fast food, candy, and cereal). On each trial, children were presented with 18 picture cards. These included six images from one brand, six images belonging to a competing brand, and six distracter cards. For example, in the soda trial, children had pictures of bottles, cans, soda fountains, and other merchandise items – six belonged to Coke and six were Pepsi branded. There were also six “irrelevant” items (e.g., bar of soap). For each trial, the researcher laid out three pages in front of the child. She commenced by sticking the logo of one brand on the first page and the logo of the competing brand on the second page. Children were asked to sort the picture cards onto the appropriate pages, and to put “any that don’t belong” on the third page. One point was awarded for each correctly placed item (i.e., the score for each collage could range from zero to six). The incorrect placement of cards was not penalized. Trial scores could potentially range from zero (complete confusion) to 18 (perfect ability to distinguish competing brands and to separate out distracters). Among this sample of children, scores ranged from 4 to 18, which is consistent with McAlister and Cornwell’s (2010) sample where no child was completely ignorant of the brands.

*Taste test.* Children completed two taste-test trials. Each trial lasted a maximum of five minutes, although children were permitted to finish early if they wished. On each occasion, children were served a drink and raw vegetables. Children could drink as much as 180mL of the beverage, but there was no limit to the amount of vegetables served during the five-minute period. The vegetables on offer were the same for both trials, namely, carrot sticks and red pepper. The drinks differed per trial: one trial offered water and the other offered Hawaiian Punch. The order of administration of trials was counterbalanced. For each trial, the experimenter recorded the amount of drink consumed (0 – 180mL), the time taken (0 – 5min), and the total weight of vegetables consumed (pepper and carrot combined).

## Results

### Characterizing Fussy Eaters

Fussiness with eating was first examined by checking the distribution of fussiness scale scores among the children sampled. The scale showed good variance, with a full range in scale scores from 1 to 5 and a mean near the mid-point ( $M = 2.84$ ,  $SD = 1.19$ ). Hence, the sample includes some fussy eaters and some easily pleased eaters, but overall the group is “normal.”

To understand the behavior of fussy eaters in this sample, we investigated whether fussy eaters were particularly knowledgeable about branded foods. Table 2 shows correlations between fussiness scale scores and brand knowledge scores for each of trials of the brand knowledge task. Fussier eaters have better knowledge of candy brands than less fussy eaters ( $r = .32$ ,  $p < .05$ ), though their knowledge of fast food, cereal, and soda brands does not differ from that of less fussy eaters. Hence, only partial support is found for H1. Results in Table 2 also show that fussier eaters view more hours of commercial TV without parent supervision each week ( $r = .32$ ,  $p < .05$ ). Further, children with greater exposure to commercial TV (unsupervised) had a better understanding of soda, fast food, and cereal brands, but no greater knowledge of candy brands.

TABLE 2  
CORRELATIONS BETWEEN FUSSINESS, BRAND KNOWLEDGE, AND TV VIEWING

	Brand knowledge				Ave. weekly TV viewing	
	Soda	Candy	Fast food	Cereal	Unsupervised	Supervised
Fussiness	.18	.32*	.25	.08	.32*	-.00
Soda brand knowledge	-	.56**	.58**	.44**	.52**	-.20
Candy brand knowledge		-	.63**	.68**	.27	-.16
Fast food brand knowledge			-	.65**	.34*	-.12
Cereal brand knowledge				-	.31*	-.12

\*  $p < .05$ , \*\*  $p < .01$

### Fussiness as it Relates to Food Exposure and Food Sampling

Prior to testing H2 (that fussier eaters will eat smaller amounts of vegetables on each of the taste-test trials), we first examined the extent to which fussiness related to a child’s history of exposure to various foods. In particular, we were interested to learn whether fussy eaters were any less familiar with the vegetables served during the taste test, than were less fussy eaters. To this end, we examined correlations between fussiness and parent reports of how frequently they serve each of these vegetables to their child. No significant findings emerged. Child fussiness regarding eating was not related to frequency of exposure to red pepper ( $r = .05$ , ns) or to carrot ( $r = -.25$ , ns), nor to any other foods or beverages (see Table 3).

TABLE 3  
CORRELATIONS BETWEEN FUSSINESS AND HOW FREQUENTLY CHILDREN ARE  
SERVED VARIOUS TYPES OF FOOD AND DRINK AT HOME

Vegetables / fruits	Beverages (as the only drink served with a meal)	Snacks / meals
Red bell pepper: .05	Water: .10	Cheese Nips, Goldfish or similar: -.08
Carrot: -.25	Hawaiian Punch: -.18	Oreos, Chips Ahoy or similar: -.10
Celery sticks: -.14	Hawaiian Punch <i>Lite</i> : -.03	Fast food: -.07
Grapes: -.13	Soda or pop: -.09	

We next examined the hypothesis that fussiness would influence the amount of vegetables consumed on each of the taste-test trials. Though the trend was in the expected direction, no significant results emerged. Fussiness scale scores were not significantly related to the amount of vegetables consumed with Hawaiian Punch ( $r = -.16$ , ns), nor to the amount of

vegetables consumed with water ( $r = -.12$ , ns). H2 was not supported.

### **Beverage Type and Vegetable Consumption**

During data collection sessions, we had observed that Hawaiian Punch seemed more popular than water. This was supported by the finding that the average amount of Hawaiian Punch consumed ( $M = 123.56\text{mL}$ ,  $SD = 64.77\text{mL}$ ) was greater than the average amount of water consumed ( $M = 54.60\text{mL}$ ,  $SD = 55.15\text{mL}$ ),  $F(1, 68) = 57.56$ ,  $p < .001$ , partial  $\eta^2 = .78$ .

Importantly, support was found for H3. Children ate a larger portion of vegetables on the water trial ( $M = 19.06\text{g}$ ,  $SD = 20.21\text{g}$ ) than on the Hawaiian Punch trial ( $M = 14.07\text{g}$ ,  $SD = 14.61\text{g}$ ),  $F(1, 69) = 7.33$ ,  $p < .01$ , partial  $\eta^2 = .10$ .

These findings show that vegetables are more popular when the drink consumed is water. Since a child's fussiness regarding food has been ruled out as an explanation for variance in vegetable consumption, it seems that consumption is somehow dependent on the beverage available to children. These findings might suggest that the consumption of a sweetened beverage such as Hawaiian Punch "primes" a child's palate to be less accepting of raw vegetables. The amount of vegetables consumed on the Hawaiian Punch trial was not significantly related to the amount of drink children had consumed ( $r = .07$ , ns). Even after consuming only a small amount of the sweetened drink, children were relatively disinterested in eating the vegetables. This may suggest that the consumption of even a small amount of sweetened beverage leads a child to be less accepting of vegetables.

### **Discussion**

Our pilot test lends empirical support to the notion that young adults do indeed hold strong drink and food combining preferences. While plain water (bottled or from the tap) pairs reasonably with most foods, soda clashes with cooked and raw vegetables but pairs very well

with foods such as French fries and pizza. This finding across young adults allows for the possibility that early learned preferences contribute to adult purchase and consumption patterns.

In the lab study, children's acceptance of raw vegetables was related to the type of drink consumed, and was not an outcome of their general fussiness regarding eating. This finding reiterates what was learned in the pilot study with adults. Vegetables offered in combination with a sweetened beverage are not looked upon as favorably as vegetables offered in combination with water. This finding points to a variety of behavioral change strategies that might be employed to encourage healthier eating among young children (as detailed in the following section).

Additional research is needed to more fully understand the mechanisms by which sweetened beverage consumption reduces child acceptance of raw vegetables. We suggest two competing hypotheses, which may not be mutually exclusive. First, a physiological mechanism may be at play, wherein children's taste palates are less accepting of certain flavor combinations. The sweetness of the Hawaiian Punch may not sit well with the less sweet (and somewhat bitter) taste of the raw vegetables. Alternatively, psychological mechanisms might explain the observed results. Although we chose to study young children in the lab study in part because of their relative inexperience with marketing, these youngsters do have some experience with marketed goods. Their exposure may have instilled in them a sense that certain items "belong together," whereas others do not. At any age, consumers rely on heuristics to aid their decision-making (Scheibehenne, Miesler, and Todd 2007), however, children with their developing cognitive capacities may be more likely to rely on stereotype judgments of which food/drink combinations they believe are appropriate. Further research might examine (by way of a parent survey) children's history of exposure to combo meals and bundled goods to determine whether

stereotyped decision biases are at play.

Whether the influence of drink type on vegetable consumption is physiological or psychological, there is suggestion that the influence is quite powerful and therefore deserving of intervention. Given that the amount of Hawaiian Punch consumed did not correlate with the amount of vegetable consumption, we know that even limited exposure (either visually or to the palate) results in lessened acceptance of vegetables. Seeing the Hawaiian Punch may bring to mind for the child associations with contexts in which vegetables are rarely served (e.g., I see Hawaiian Punch and it reminds me of a birthday party with cake and savory snacks).

Alternatively, tasting even a sip of a sweetened beverage may prime the palate to anticipate foods regularly paired with sweet drinks. Additional research could examine whether children's consumption of foods typically paired with sweet drinks (e.g., chips, French fries, pizza) is heightened when the beverage consumed is sweet versus when water is served. Our pilot study findings suggest this may be the case, however, since we did not offer high-calorie, savory snacks in our taste test trials, this is yet to be confirmed with children.

Children in this sample were observed to have some exposure to food and drink brands, and were adept at recalling some brand information. Children's memory for candy brands was related to fussiness regarding eating. This might suggest that fussy eaters attend more to candy brands. We learned that they had no greater exposure to candy (i.e., fussiness was not correlated with children's frequency of being served candy), however, if candy is one of the few foods that is enjoyed by the fussy eaters they may be more likely to request it or think about it in situations when it is not available. The finding that unsupervised TV viewing is not related to knowledge of candy brands, but is related to increased knowledge of soda, fast food, and cereal brands is not surprising. Fast food (whose ads frequently include paired sodas) and cereals are two of the

product categories most heavily advertised during children's TV viewing slots, while TV ads for candy have been declining in frequency (Powell, Szczypka, and Chaloupka 2010).

Fussiness was a non-predictor of how frequently children had been served various vegetables. At face value, this might suggest that all children are equally experienced eaters of vegetables or that the palates of all children in our sample are accepting of the taste of the vegetables we served. This, however, is not entirely true. Our data tell us how frequently children are served various foods, but do not inform us as to how frequently children consume the foods they are served, or in what quantities. Thus, it was entirely reasonable to examine the link between fussiness and vegetable consumption in the taste-test trials. The non-significant relationship between fussiness and vegetable consumption lends even stronger support to the conclusion that drink type influences vegetable acceptance.

### **Policy Implications and Suggestions for Change**

If even the smallest exposure to sweetened beverages affects children's acceptance of vegetables, there is reason for action. From a transformative consumer research perspective, one that seeks to help consumers make better decisions, eating environments should foster positive dietary habits, rather than discourage vegetable consumption. This is particularly so when we consider prior studies have shown that eating patterns early in life persist over time and are linked to adult health outcomes (Kemmer 1987). Possible policies that might be considered as voluntary industry decisions or enforced promotion limitations include offering only water as the default drink in combo meals, especially when targeting children. Likewise, buffet restaurants – where children frequently serve themselves - might limit visual and physical access to soda by replacing all-you-can-drink soda fountains with water fountains. If soda is offered, access to it may be less convenient (e.g., having to order soda rather than being able to help oneself). Similar

measures could be implemented in the home environment. For example, parents could make certain that water is the drink served with all meals. Sweetened beverages might be kept out of sight, or for those families who are able to make the change, sweetened drinks like Hawaiian Punch and soda could be removed from the home environment. Water and milk are complements for many meals and children seeking a sweet treat during the day may come to favor juice if it is the major source of sweet drink in the house.

While some of these changes may sound radical, many are already being trialed in California preschools. The Healthy Beverages in Child Care act was signed into law in California in 2010. The act specifies provisions, which go into effect in 2012, and require that licensed child day care facilities in California must serve no beverages with added sweeteners (either natural or artificial) and must make clean and safe drinking water readily available and accessible for consumption throughout the day (Robert Wood Johnson Foundation 2010).

## References

- Aldridge, Victoria, Terence M. Dovey, and Jason C. G. Halford (2009), "The Role of Familiarity in Dietary Development," *Developmental Review*, 29, 32-44.
- Blossfeld, Ivonne, Aoife Collins, Suzanne Boland, Raquel Baixauli, Mairead Kiely, and Conor Delahunty (2007), "Relationships between Acceptance of Sour Taste and Fruit Intake in 18-month Old Infants," *British Journal of Nutrition*, 102, 1375-85.
- De Houwer, Jan, Sarah Thomas, and Frank Baeyens (2001), "Associative Learning of Likes and Dislikes: A Review of 25 Years of Research on Human Evaluative Conditioning," *Psychological Bulletin*, 127 (6), 853-69.
- Gall, Tom, Teresa Barnett, William Lew, and Jodean Selmants (1987), "Cueing the Consumer: The Role of Salient Cues in Consumer Perception," *Journal of Consumer Marketing*, 4 (2), 23-28.
- Kemm, J. R. (1987), "Eating Patterns in Childhood and Adult Health," *Nutrition and Health*, 4, 205-15.
- Liem, Djin G. and Julie A. Mennella (2003), "Heightened Sour Preferences During Childhood," *Chemical Senses*, 28, 173-80.

McAlister, Anna R. and T. Bettina Cornwell (2010), "Children's Brand Symbolism Understanding: Links to Theory of Mind and Executive Functioning," *Psychology and Marketing*, 27 (3), 203-28.

Naleid, Amy M., Jeffrey W. Grimm, David A. Kessler, Alfred J. Sipols, Sepideh Aliakbari, Jennifer L. Bennett, Jason Wells, and Dianne P. Figlewicz (2008), "Deconstructing the Vanilla Milkshake: The Dominant Effect of Sucrose on Self-Administration of Nutrient-Flavor Mixtures," *Appetite*, 50, 128-38.

Northstone, K., P. Emmett, and The ALSPAC Study Team (2005), "Multivariate Analysis of Diet in Children at Four and Seven Years of Age and Associations with Socio-Demographic Characteristics," *European Journal of Clinical Nutrition*, 59, 751-60.

Pliner, Patricia (1994), "Development of Measures of Food Neophobia in Children," *Appetite*, 23, 147-63.

Powell, Lisa M., Glen Szczypka, and Frank J. Chaloupka (2010), "Trends in Exposure to Television Food Advertisements Among Children and Adolescents in the United States," *Archives of Pediatrics and Adolescent Medicine*, 164 (9), 794-802.

Robert Wood Johnson Foundation (2010), "Healthy Beverages in Child Care Bill Signed into Law in California," (accessed January 18, 2011), [available at <http://www.healthyeatingresearch.net/news/271-healthy-beverages-in-child-care-bill-signed-into-law-in-california>].

Schlosser, Eric (2001), *Fast Food Nation*. New York: Houghton Mifflin.

Scheibehenne, Benjamin, Linda Miesler, and Peter M. Todd (2007), "Fast and Frugal Food Choices: Uncovering Individual Decision Heuristics," *Appetite*, 49, 578-89.

Schmeltzer, John (2007), "Pop Fans Pour it on in the Morning," *Chicago Tribune* (accessed 15 January, 2010), [available at [http://www.redorbit.com/news/health/801876/pop\\_fans\\_pour\\_it\\_on\\_in\\_the\\_morning/#](http://www.redorbit.com/news/health/801876/pop_fans_pour_it_on_in_the_morning/#)].

Sharpe, Kathryn M. and Richard Staelin (2010), "Consumption Effects of Bundling: Consumer Perceptions, Firm Actions, and Public Policy Implications," *Journal of Public Policy & Marketing*, 29 (2), 170-88.

Stremersch, Stefan and Gerard J. Tellis (2002), "Strategic Bundling of Products and Prices: A New Synthesis for Marketing," *Journal of Marketing*, 66 (January), 55-72.

Venkatesh, R. and Wagner Kamakura (2003), "Optimal Bundling and Pricing Under a Monopoly: Contrasting Complements and Substitutes from Independently Valued Products," *Journal of Business*, 76 (2), 211-31.

Wardle, Jane and Lucy Cooke (2008), "Genetic and Environmental Determinants of Children's Food Preferences," *The British Journal of Nutrition*, 99 (S1), S15-S21.