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Author manuscript

*Clin Pediatr (Phila)*. Author manuscript; available in PMC 2015 November 01.

Published in final edited form as:

*Clin Pediatr (Phila)*. 2015 November ; 54(13): 1257–1264. doi:10.1177/0009922815574078.

## Reach Out and Eat: Food and Beverages Depicted in Books for Preschoolers

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### Abstract

**Objective**—To examine food and beverage depictions in books for preschoolers.

**Methods**—Books for preschoolers from Reach Out and Read (ROR; n = 42), public library (n = 27), and Publisher's Weekly booklists (n = 31) were examined for nutritive and empty-calorie food and beverage depictions.

**Results**—It was found that 66% of books depicted at least 1 food or beverage. More books depicted nutritive items than empty-calorie items (87.5% vs 54.7%,  $P < .001$ ). There was a trend toward fewer empty-calorie depictions in ROR books than in other booklists. Yet nearly half of ROR books depicted at least 1 empty-calorie item. ROR books also accounted for 5 of 10 books with the most empty-calorie item depictions and 3 of 4 books with branding. With regard to messaging, approximately a third of books with the most empty-calorie depictions promoted unhealthy foods.

**Conclusions**—When selecting books for ROR, it may be important to consider food and beverage depictions and messages.

### Keywords

foods; beverages; nutrition; children; books

### Introduction

More than 21% of 2- to 5-year-old children in the United States are overweight or obese.<sup>1</sup> Childhood obesity is a multifactorial problem but can be simply conceptualized as an

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#### Author Contribution

JLE helped conceive and design the study, acquire and analyze the data, and draft and revise the manuscript. JL, helped acquire and analyze data and revise the manuscript. KAM helped conceive the study, guide data analyses, and revise the manuscript. AIP conceived the study, assisted with data analysis, and helped draft and revised the manuscript.

#### Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

imbalance in energy intake and energy expenditure. With regard to energy intake, multiple factors influence preschoolers' dietary preferences and intake. These factors can include the types of foods and beverages available in the home, school, or child care environment; modeling by peers and influential adults; and media influences.<sup>2-6</sup>

Media influences, such as exposure to television, advertising, gaming, and print material, have increased over the past several decades. Such outlets expose children to marketing messages that may increase their requests for and consumption of advertised products.<sup>7</sup> Unfortunately, food companies primarily market empty-calorie foods to young children.<sup>8-10</sup> A 2006 content analysis of television shows for preschoolers found that the majority of food advertisements promoted fast food restaurants or products such as sweetened cereal.<sup>9</sup> Similarly, in a 2007 analysis of advertisements on Nickelodeon, a television station targeting youth, 88% of food advertisements featured foods of poor nutritional quality.<sup>10</sup>

Partly as a result of the negative influence of media exposure on child development, in 2001, the American Academy for Pediatrics (AAP) established guidelines for television viewing among young children. These guidelines stated that children <2 years of age should not watch television and that children 2 to 5 years of age should watch less than 2 hours of television per day. These guidelines simultaneously emphasized the importance of interactive activities, such as reading age-appropriate books.<sup>11</sup>

In addition to the AAP, many other groups have emphasized the importance of activities promoting early literacy among young children. Reach Out and Read (ROR), a nonprofit program established in 1989, encourages pediatric practitioners to promote early literacy by speaking with parents about the importance of reading aloud to their children and by giving young children 0-to 5 years old approved books at well-child examination visits. ROR reports to have almost 5000 programs serving 4 million children per year in all 50 states, Washington, DC, Puerto Rico, the US Virgin Islands, the Northern Mariana Islands, and US Military bases overseas; in 2012, the program distributed more than 6 million books annually.<sup>12</sup> Another group that historically has promoted reading among children is the public library system; many local public libraries host a story time for preschool-aged children and list recommended books for young children on their Web sites.

To our knowledge, only one content analysis has analyzed foods and beverages depicted within books for preschool-aged children. That study, conducted with only bestselling books, found that books depicted vegetables significantly less often than fruits.<sup>13</sup> No study has examined the nutritional content of books recommended by public libraries or ROR. Given the potential for food depictions in books to influence young children's food intake patterns, this study endeavored to identify foods and beverages most commonly depicted among 3 common booklists for preschool-aged children: ROR, library recommended, and Publisher's Weekly bestselling booklists. Because the Publisher's Weekly bestselling booklist is based solely on the popularity of books, we hypothesized that ROR and library-recommended books would depict a greater number of nutritive foods and beverages as compared with the bestselling list.

## Methods

### Study Sample

We conducted a content analysis of foods and beverages most frequently depicted in books intended for 2- to 5-year-old children. We sampled books from 3 common booklists: ROR, library-recommended, and Publisher's Weekly bestselling booklists.

We obtained the ROR booklist from ROR's "Annotated Booklist for Children." We included books from the subsections of toddlers, preschoolers, and multicultural books, which resulted in a total of 45 books.<sup>12</sup> We excluded 3 books that could not be located in local libraries or bookstores (*Josephine's Imagination: A Tale of Haiti* by Arnold Dobrin, *Where's Nicky?* by Cathryn Falwell, and *Rain Feet* by Angela Johnson). The final ROR booklist had 42 books.

We sampled library-recommended booklists by referencing Web sites of libraries from the largest city in each of the 10 most populous US states according to the 2000-2009 US Census Bureau estimates.<sup>14,15</sup> From these Web sites, we included books from recommended reading lists referencing picture books, preschoolers, or young children. We could not access booklists from online Web sites for the public libraries in Jacksonville, Florida, or Columbus, Ohio, and therefore excluded booklists from those libraries. From this sample of 8 library booklists, we included 27 books present on 2 or more library-recommended booklists.

We considered 34 bestselling books that were listed as a children's picture book bestseller for more than 1 month on the monthly Publisher's Weekly booklist, from July 2009 to August 2010.<sup>16</sup> We excluded 2 of the 34 books on this booklist with more than 100 pages because they targeted an older audience. We also excluded 1 book that could not be located in local libraries or bookstores (*Max's Easter Surprise* by Rosemary Wells). The final bestselling booklist included 31 books.

The final sample of books for the study consisted of 42 books (43%) from the physician-recommended booklist, 27 books (28%) from the library-recommended booklist, and 31 books (32%) from the bestselling book-list. The ROR and library-recommended booklist contained 3 of the same books (*Madeline* by Ludwig Bemelmans, *The Very Hungry Caterpillar* by Eric Carle, and *Brown Bear, Brown Bear, What Do You See?* by Bill Martin Jr); these books appeared only once on the final list. The final number of unique books analyzed was 97.

### Procedure

We accessed the books in our sample from local libraries or bookstores. To establish a codebook for the study, the authors of this article iteratively examined a subset of these books and created extensive, though not exhaustive, lists of foods in their appropriate nutrition category, as defined by the United States Department of Agriculture's (USDA's) My Pyramid guidelines.<sup>17</sup> Final food codes included vegetables, fruits, grains (we did not differentiate between whole grains and non-whole grains), proteins, desserts, healthy dairy (ie, plain milk, cheese, and yogurt), unhealthy dairy (ie, flavored milk, ice cream, frozen

yogurt, pudding, milkshake, and any other milk-based desserts), savory snacks, butter/oils, and combination foods (ie, foods that contained more than 1 already-mentioned food category); final beverage codes included milk, water, juice, and sugar-sweetened beverages.

Three trained coders independently coded the entire sample of books using the final coding instructions. For each book, we collected the following information: title, author, illustrator, publisher, publication date, publication location, booklist, awards received (eg, Caldecott), and the number of pages. We counted food and beverage items depicted either via text or illustration. We coded each page separately, and every distinct food or beverage pictured or written in the text on that page was coded as a mention of the food or beverage category (eg, a picture of an apple and banana would be coded as 2 mentions of fruit). When books depicted a food or beverage item as a group or more than once on a single page (eg, a basket of apples or bunch of carrots), we coded the item as only 1 mention. When a food or beverage item was pictured and written in the text, we coded the item as 2 separate mentions. Some food/beverage items fell into more than 1 category (ie, ice cream as a dessert and unhealthy dairy); we double coded these items. However, all unhealthy dairy items were double coded as desserts, and therefore, we did not use unhealthy dairy as a variable in the analysis.

After the initial analyses, the 10 books with the most nutritive food group mentions (Table 1) and the 10 books with the most empty-calorie mentions (Table 2) were coded a second time for context. They were coded as positive, negative, or neutral. The books coded as positive encouraged healthy eating and/or discouraged unhealthy eating. For example, *The Very Hungry Caterpillar* by Eric Carle was coded as positive because after the caterpillar eats “one piece of chocolate cake, one ice-cream cone, one pickle, one slice of Swiss cheese, one slice of salami, one lollipop, one piece of cherry pie, one sausage, one cupcake, and one slice of watermelon,”<sup>18</sup> he has a stomachache. However, when the caterpillar just eats one leaf, he feels much better.<sup>18</sup> The books that discouraged healthy eating and/or encouraged unhealthy eating were coded as negative. An example of a book that was coded negative is *Alexander and the Terrible, Horrible, No Good, Very Bad Day* by Judith Viorst because Alexander says, “There were lima beans for dinner and I hate limas. . . . It has been a terrible, no good, very bad day.”<sup>19</sup> The books coded as neutral did not place a value judgment about the foods or beverage depicted in the storyline. Any discrepancies in the coding were resolved through a group discussion with the coders and the senior author; therefore, there was consensus among all the coders in the final coding.

## Data Analyses

We analyzed data using Stata version 10.0 (StataCorp LP, College Station, TX). We used *t* tests to compare differences in the number of nutritive food group food/beverage mentions versus empty-calorie food/beverage mentions in the total sample of books. We used  $\chi^2$  and Fisher's exact tests to compare differences in food types (eg, nutritive food group vs empty-calorie foods/beverages) and food mentions per page among the 3 different booklists. In sensitivity analyses, results did not change by including and excluding the 3 books that appeared on more than 1 booklist.

## Results

### Study Sample

Of the 97 books in the sample, 66% had at least 1 depiction of food or beverage in either text or illustration: 60% of books on the ROR booklist, 70% of books on the library-recommended booklist, and 71% of books on the bestselling booklist. Books had an average length of 30 pages, with a range of 20 to 61.

### Nutritive Food, Empty-Calorie Food, and Beverage Mentions in Books

Among books with at least 1 food or beverage mention, more books included at least 1 nutritive food group mention (87.5%) than 1 empty-calorie mention (54.7%;  $P < .001$ ; Figure 1). However, more than half of the books with food or beverage mention (54.7%) still contained at least 1 mention of an empty-calorie food.

Although there was a trend for fewer books on the ROR booklist to have empty-calorie food references (44.0%) as compared with the library-recommended booklist (58.8%) and bestselling booklist (63.6%), these differences were not statistically significant ( $P = .37$ ).

Books that depicted foods and beverages in text or illustration had an average of 6 food or beverage mentions per 10 pages. Books mentioned nutritive foods or beverages more frequently ( $P < .001$ ) on average (5 mentions/10 pages) than empty-calorie foods or beverages (1 mention/10 pages).

### Types of Individual Foods and Beverages in Books

Among books with at least 1 food mention, a higher percentage of books mentioned foods in the individual categories of fruits (60.3%), dessert (52.4%), and protein (49.2%) than other food categories (Table 3). Books from the library-recommended booklist and the bestselling booklist most commonly depicted desserts; ROR books most commonly depicted protein and fruit. Notably, none of the books in our sample mentioned savory snacks, which we defined as salty foods such as chips, snack crackers, or pretzels. Overall, books that had at least 1 food or beverage mention had fewer beverage mentions (34.4%) than food mentions (98.4%;  $P < .001$ ). Books including beverage mentions depicted water less frequently than other beverages (Table 4).

### Books With the Most Nutritive and Empty-Calorie Food and Beverage Mentions

ROR books accounted for 6 of the 10 books with the most nutritive food group mentions (Table 1), and they also accounted for 5 of the 10 books with the most empty-calorie mentions (Table 2). Three ROR books were represented in both these categories.

Four books contained branded foods: Nubs: The True Story of a Mutt, a Marine and a Miracle, from the Publisher's Weekly Bestselling booklist, had 2 mentions of Strawberry Pop-Tarts; Alexander and the Terrible, Horrible, No Good, Very Bad Day, from the ROR booklist, had 1 mention of a Hershey bar; *Bread, Bread, Bread*, from the ROR booklist, had pictures of Pillsbury flour with other branded cooking products; and *Family Pictures*,

from the ROR booklist, had 1 mention of Coca-Cola. ROR books accounted for 3 of the 4 books with branding.

### **Context of the Books With the Most Nutritive and Empty-Calorie Food and Beverage Mentions**

Of the 10 books with the most nutritive food group mentions (Table 1), 7 had a positive context about food, 3 were neutral, and 0 had a negative context. Four out of the 7 books with a positive context and most nutritive mentions were on the ROR booklist. Of the 10 books with the most empty-calorie mentions (Table 2), 3 had a positive context, 4 were neutral, and 3 had a negative context. Two of the 3 books with a positive context and the most empty-calorie mentions were from the ROR booklist. Only 1 book that was determined to have a negative context was from the ROR booklist.

### **Discussion**

To our knowledge, this is only the second study to examine the types of foods and beverages depicted in children's books. Moreover, our study is the only study to investigate how the types of foods and beverages depicted in children's books vary depending on the source recommending them (ie, physician's offices, libraries, or from bestseller lists). In this study, most books with foods and beverages had pictorial or text references to nutritive food groups, yet half of these books also depicted empty-calorie foods and beverages. Whereas books provided to children in physician's offices should promote healthy eating habits, almost half of the books from the ROR program contained references to empty-calorie food items.

Our sample of books contained more depictions of nutritive food group items than empty-calorie food items. These trends are contrary to those found in previous studies, which demonstrated a preponderance of sugar-rich foods such as cake, candies, and other treats in children's elementary school textbooks<sup>20,21</sup> and children's cookbooks.<sup>22</sup> Greater empty-calorie food depictions in elementary school books and cookbooks may reflect the fact that such books target older children. A study of top-grossing G and PG movies from 2006 to 2010 also demonstrated that the majority of movies had content inconsistent with AAP's nutrition recommendations; unhealthy snacks and sugar-sweetened beverages were present in 80% and 55% of movie segments, respectively.<sup>23</sup> Future studies may consider examining the nutrition content of television shows that target young children as well.

Branding of food and beverage items can also affect children's consumption of nutritional or empty-calorie items. Because most children view advertisements, a popular medium for branding, while watching television, commercials may serve as an added source of influence that can affect children's requests and even consumption of products.<sup>24-26</sup> Indeed, previous studies suggest that television programming for preschool-aged children demonstrates a disproportionate number of advertisements for high-sugar foods.<sup>9,27,28</sup> Although branding, a type of advertising, did not occur frequently in our sample of books, when branding did occur, it was most commonly for unhealthy items (ie, Hershey chocolate bar, Strawberry Pop-Tarts, and Coca-Cola). Parents and educators should be aware of and savvy to branding in books for young children.

Our sample of books infrequently depicted vegetables and water, food and beverages recommended for nearly unlimited consumption among preschool-aged children by physicians and nutrition authorities. One possible explanation for the low portrayal of vegetables and water in children's books is that authors may choose written and illustrated content that is most likely to appeal to preschool-aged children; vegetables and water are likely low on that list. However, because children's books can be used as educational tools, increased exposure to healthy food items such as vegetables and water through book text and illustrations may help increase children's currently low consumption of these items.<sup>29,30</sup> Indeed, in a recent campaign, the AAP has endorsed *The Very Hungry Caterpillar* by Eric Carle as a book that can be used to teach young children about nutrition.<sup>31</sup> Additionally, as a part of the "Rethink your Drink" Campaign, the Bay Area Nutrition and Physical Activity Collaborative created the book *Potter the Otter: A Tale About Water*, which they distribute to community agencies, physician offices, and child care facilities to encourage children to drink more water.<sup>32</sup>

Of the top 10 books with healthy mentions of food, none of them had a negative context. This is reassuring, given that positive depictions of healthy foods in children's books may help motivate healthy nutritional choices. Additionally, even though children's books may have a large number of empty-calorie food and beverage mentions, they can still relay positive nutritional messages. For example, although *The Very Hungry Caterpillar* has many empty-calorie food and beverage mentions, because of its positive message about eating healthy foods, it is endorsed by the AAP as a book that can teach children about nutrition. However, this is not always the case. Only 3 of the top 10 books with the most empty-calorie mentions in our sample were determined to have a positive context about nutrition. The remaining 7 books were either neutral or actually had a negative message about nutrition. As suggested in previous experimental studies, children are more likely to adopt negative behaviors when they are coupled with neutral or negative rather than positive messages about that behavior.<sup>33-35</sup> Moreover, given that preschoolers are just beginning to learn to read, they may be dependent on adults to understand the context and messages of books. If young children are looking at books independently, they may only take away messages portrayed in illustrations (eg, caterpillar eating pies and candy).

Previous studies suggest that when parents participate in media experiences with their children, it can help mitigate negative messages.<sup>36</sup> With regard to nutrition messaging in books, if parents are actively engaged in the book's storyline and discuss food choices or depictions with their children, they may be able to reduce the negative impact of unhealthy food portrayals and emphasize the positive impact of healthy food choices.

Although we coded books from several different sources, we were particularly interested in the types of food and beverage depictions that are present in books in ROR, a program that is endorsed by pediatricians and that distributes books through preventive care visits for children. Nearly half of ROR books in this study had at least 1 empty-calorie mention, and of the top 10 books with the most empty-calorie mentions, half were from the ROR booklist. Additionally, 3 out of the 4 books that contained branding came from the ROR booklist. Providing ROR books to children that depict empty-calorie items or branding can contradict the nutrition guidance given by clinicians. ROR may want to consider adding nutrition

content and branding in their book selection criteria.<sup>37</sup> Furthermore, when handing out ROR books, pediatricians may want to talk to parents not only about the importance of reading but also about the values portrayed in books.

This study has several limitations. First, our small sample size of 97 books may have limited our power to detect differences in food and beverage depictions among booklists.

Additionally, coding of food and beverage items into broad USDA My Pyramid categories may have decreased our ability to detect potential differences in nutritional content within the categories. For example, 1 cup of cheddar cheese has significantly more calories, fat, and saturated fat than 1 cup of low-fat milk, but we categorized both food items in the healthy dairy category. Although this study was a content analysis, future experimental studies could further investigate how both mentions of food and beverages as well as context influence young children's eating patterns.

In conclusion, our study demonstrates that a large proportion of books recommended to preschool-aged children contain depictions of empty-calorie items, which may influence young children's eating habits. In particular, nearly half of the books recommended to preschool-aged children through ROR have mentions of empty-calorie items, which can contradict nutrition guidance given by pediatric providers. Because books can be used as an educational tool for young children and families, programs such as ROR and public libraries may want to consider the nutrition content of books and the presence of branding of products when recommending books to young children.

## Acknowledgments

The authors would like to thank Kaylynn England for her help in coding books in this study.

### Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Dr Patel was supported in part by Grant No. 1 K23 HD067305-01A1 from the National Institutes of Health.

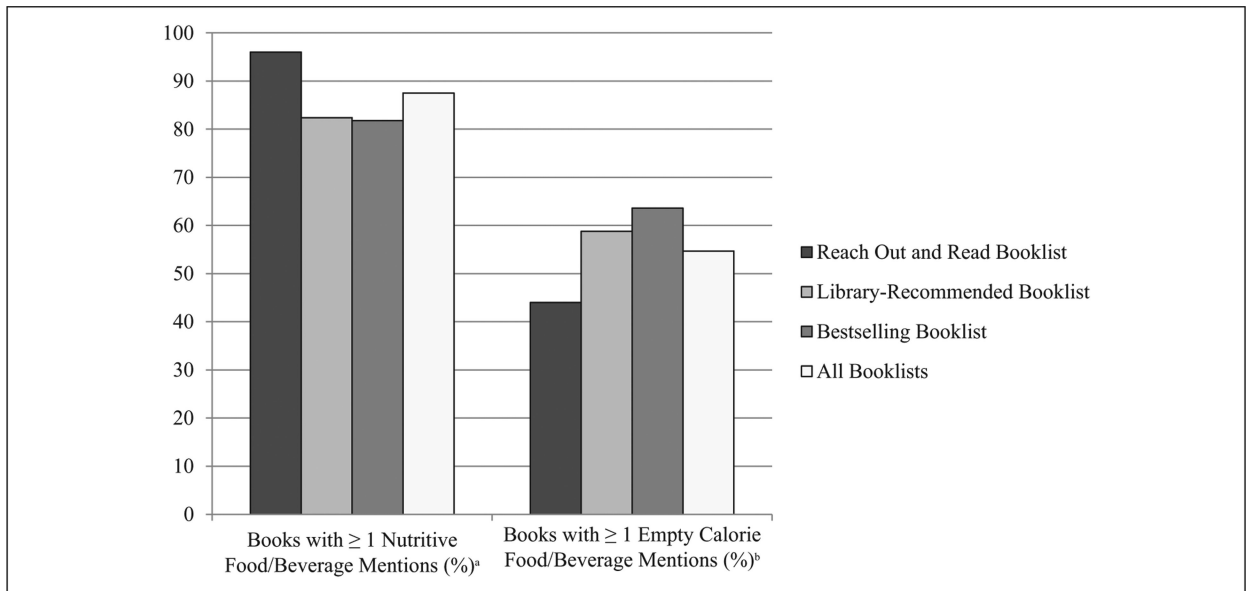
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**Figure 1.** Nutritive food group and empty-calorie food/beverage mentions in popular books for preschoolers.<sup>c</sup>

<sup>a</sup> $P = .26$ .

<sup>b</sup> $P = .37$ .

<sup>c</sup> $P < .001$  when “All Booklists” with nutritive food/beverage mentions (white bar on left) is compared with “All Booklists” with empty-calorie food/beverage mentions (white bar on right).

**Table 1**

Top 10 Books With the Most Nutritive Food and Beverage Mentions.

<b>Book Title</b>	<b>Booklist</b>	<b>Total Number of Mentions</b>	<b>Context</b>
<i>Strega Nona's Harvest</i>	Bestselling	96	Positive
<i>The Sandwich Swap</i>	Bestselling	82	Positive
<i>Feast for 10</i>	Library-Recommended List	69	Positive
<i>How Are You Peeling? Foods with Moods</i>	Library-Recommended List	56	Neutral
<i>Gregory the Terrible Eater</i>	Reach Out and Read	48	Positive
<i>The Day Jimmy's Boa Ate the Wash</i>	Reach Out and Read	47	Neutral
<i>Bread, Bread, Bread</i>	Reach Out and Read	44	Positive
<i>Everybody Cooks Rice</i>	Reach Out and Read	41	Positive
<i>Chickens Aren't the Only Ones</i>	Reach Out and Read	31	Neutral
<i>The Very Hungry Caterpillar</i>	Reach Out and Read, and Library-Recommended List	27	Positive

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**Table 2**

Top 10 Books With Most Empty-Calorie Food and Beverage Mentions.

<b>Book Title</b>	<b>Booklist</b>	<b>Total Number of Mentions</b>	<b>Context</b>
<i>Old Black Fly</i>	Library-Recommended List	13	Neutral
<i>A Chair for My Mother</i>	Reach Out and Read	13	Neutral
<i>Alexander and the Terrible, No Good, Very Bad Day</i>	Reach Out and Read	12	Negative
<i>The Sandwich Swap</i>	Bestselling	12	Positive
<i>The Very Hungry Caterpillar</i>	Reach Out and Read, and Library-Recommended List	12	Positive
<i>Family Pictures</i>	Reach Out and Read	11	Neutral
<i>Ladybug Girl at the Beach</i>	Bestselling	10	Negative
<i>Harold and the Purple Crayon</i>	Library-Recommended List	9	Neutral
<i>Fancy Nancy: Heart to Heart</i>	Bestselling	9	Negative
<i>Gregory the Terrible Eater</i>	Reach Out and Read	8	Positive

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**Table 3**

Proportion of Books for Preschoolers With at Least 1 Food Reference, by Food Type.

	All Books, n (%), n = 63	Reach Out and Read Books, n (%), n = 25	Library-Recommended Books, n (%), n = 17	Bestselling Books, n (%), n = 21	P Value
Fruits	38 (60.3)	16 (64.0)	11 (64.7)	11 (52.4)	.66 <sup>a</sup>
Dessert	33 (52.4)	10 (40.0)	10 (58.8)	13 (61.9)	.28 <sup>a</sup>
Protein	31 (49.2)	17 (68.0)	7 (41.1)	7 (33.3)	.05 <sup>a</sup>
Vegetables	29 (46.0)	9 (36.0)	7 (42.1)	13 (61.9)	.19 <sup>a</sup>
Grains	27 (42.8)	11 (44.0)	3 (17.6)	13 (61.9)	.02 <sup>b</sup>
Combination foods	20 (31.8)	9 (36.0)	6 (35.3)	5 (23.8)	.63 <sup>a</sup>
Healthy dairy	12 (19.0)	4 (16.0)	3 (17.6)	5 (23.6)	.85 <sup>b</sup>
Butter/Oils	8 (12.7)	4 (16.0)	1 (5.9)	3 (14.3)	.71 <sup>b</sup>
Savory snacks	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	—

<sup>a</sup> P values were calculated using a  $\chi^2$  test.<sup>b</sup> P values were calculated using a Fisher's exact test.

**Table 4**

Proportion of Books for Preschoolers With at Least 1 Beverage Reference, by Beverage Type.

	All Books, n (%), n = 22	Reach Out and Read Books, n (%), n = 7	Library-Recommended Books, n (%), n = 5	Bestselling Books, n (%), n = 10)	P Value
Milk	10 (45.5)	2 (28.6)	4 (80.0)	4 (40.0)	.26 <sup>a</sup>
Juice	9 (40.9)	3 (42.8)	1 (20.0)	5 (50.0)	.75 <sup>a</sup>
Sugar-sweetened beverages	6 (27.3)	2 (28.6)	0 (0.0)	4 (40.0)	.39 <sup>a</sup>
Water	5 (22.7)	2 (28.6)	0 (0.0)	3 (30.0)	.54 <sup>a</sup>

<sup>a</sup>P values were calculated using a Fisher's exact test.

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