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USING REPEATED EXPOSURE THROUGH HANDS-ON COOKING TO INCREASE CHILDREN'S PREFERENCES FOR FRUITS AND VEGETABLES

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Abstract

Few children in the United States meet national fruit and vegetable intake recommendations, highlighting a need for interventions. Children's food preferences act as a barrier to fruit and vegetable consumption, but prior research has demonstrated that repeated taste exposures can increase children's acceptance of these foods. Prior research in this area has typically utilized controlled procedures in which children sample small tastes of target foods over repeated occasions. The primary aim of the present pilot study was to test whether children's preferences for target fruits and vegetables increased following repeated taste exposures to them through hands-on cooking in a community setting. Seventeen 6-to-8-year-old children participated in biweekly study sessions during six weeks of a summer camp serving lower-income families. Liking of (yummy, just OK, yucky) and rank-ordered preferences for nine fruits and vegetables were measured before and after exposure sessions (pre-test and post-test). Based on pre-test assessments, four relatively less liked foods (two fruits, two vegetables) were chosen to become target foods. Children were then exposed to target foods during nine hands-on cooking sessions; liking of target foods was also measured at a midpoint assessment. At each exposure session, children assisted with preparation of a different snack using a recipe involving target foods and then ate the prepared snack together. Preferences for target foods increased from pre-test (Median=5.8) to post-test (Median=5.5; $p < 0.05$). On average, the majority of children rated the prepared snacks favorably. Results from this pilot study demonstrate the potential of applying repeated exposure techniques via hands-on cooking in a community setting.

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Keywords

repeated exposure; cooking; summer camp; food preferences; children; low-income

Despite health benefits, the majority of US children fail to meet national fruit and vegetable recommendations, highlighting a need for intervention (Kim et al., 2014). In addition, some subgroups are disproportionately affected by those trends, such as children from low-income families and Black and Latino children (Larson & Story, 2015). Food preference is a key factor influencing food consumption, highlighting the importance of efforts to promote acceptance of healthy foods such as fruits and vegetables (Russell, Worsley, & Campbell, 2015) especially in settings where children at increased risk of low fruit and vegetable intake spend time.

Prior research has found that repeated taste exposures can bolster children's acceptance of foods, with the most commonly studied target foods being fruits and vegetables (Cooke, 2007; Anzman-Frasca, Ventura, Ehrenberg, & Myers, 2018; Anzman-Frasca & Ehrenberg, 2018). This strategy has been studied more in younger children than those in middle childhood (ages 6–11), with some research suggesting that fewer exposures are required to show an effect for younger children compared to older children, who may require more exposures due to already-established preferences (Cooke, 2007). Among studies demonstrating repeated exposure effects during middle childhood, increases in target food acceptance have been shown following 2–9 exposures (Lakkakula et al., 2011; Lakkakula, Geaghan, Zanovec, Pierce, & Tuuri, 2010; Hausner, Hartvig, Reinbach, Wendin, & Bredie, 2012; Liem & de Graaf, 2004; Wardle, Herrera, Cooke, & Gibson, 2003). In contrast, in a school-based study of 9-to-11-year-old children (Olsen, Ritz, Kraaij, & Moller, 2012), there were decreases in vegetable liking and intake after repeated exposures. Variability across study results could be explained by a number of factors, including setting, food type (e.g., fruits versus vegetables; Lakkakula et al., 2011), and inconsistency in the way foods are prepared across studies (Keller, 2014). Individual differences may play a role as well. Alternative methods to repeated exposure, such as associative conditioning, may be preferable to encourage first tastes in certain subgroups less likely to try new foods (e.g., older children, children high on food fussiness; Anzman-Frasca & Ehrenberg, 2018; Caton et al., 2014). Additionally, some children may never come to like certain foods.

Variability across study results could also be attributed to initial liking of target foods. Those initially disliking target foods have shown greater increases in liking compared to those who initially liked the foods (Hartvig, Hausner, Wendin, Ritz, & Bredie, 2015; Lakkakula et al., 2010). Those who liked the foods may have been familiar with them, hindering further familiarization learning. Also, when participants indicate high liking at baseline, ceiling effects can result, as the extent to which participants can show improvement in liking is limited. Use of alternative outcomes (e.g., rank-ordered preference) may help address this issue in some cases, as individuals could increase their preferences for already-liked foods over and above other liked foods. Overall, research supports the general idea that repeated exposure can promote food acceptance during middle childhood, with some variability

among studies and evidence that changes in acceptance may be the greatest for foods that are not already well-accepted.

The majority of repeated exposure studies conducted with school-age children have been in laboratory and school settings with higher socioeconomic status populations, leaving opportunities to extend this work to additional settings and more diverse populations. There is a particular need to extend this area of research to naturalistic settings serving lower-income children. Furthermore, in the summer lower-income children are at increased risk of unhealthy behaviors due to the loss of structure that the school year provides, as well as school-provided meals (Brazendale et al., 2017). Summer camps can help to counteract these losses (Hanes, Rife, & Laguna, 2005), with prior studies demonstrating increased preferences for healthy foods following implementation of multi-component nutrition interventions in these settings (Heim, Stang, & Ireland, 2009). Summer camps are a promising setting for reaching populations at increased risk of low fruit and vegetable intake and testing whether repeated exposure effects extend to these settings.

While most repeated exposure studies involve small tastes of target foods on their own over repeated occasions, another possibility is to expose children to the foods in mixed dishes. This approach offers an opportunity to connect the literature on repeated exposure with that of cooking classes, which are another way that researchers have attempted to increase children's fruit and vegetable consumption. A meta-analysis of nutrition education programs supported the effectiveness of such experiential learning (Dudley, Cotton, & Peralta, 2015). Such approaches may assist in reducing neophobia; the success of hands-on approaches has also been attributed to the sense of ownership generated via experiential learning (Heim et al., 2009). Increased preferences for and consumption of healthy foods such as vegetables or fruits have been demonstrated following programs specifically teaching children simple cooking skills (Hersch, Perdue, Ambroz, & Boucher, 2014; Jarpe-Ratner, Folkens, Sharma, Daro, & Edens, 2016; Cunningham-Sabo & Lohse, 2014), including a multicomponent intervention that involved both hands-on cooking in the classroom and repeated exposure in the lunchroom (Liquori, Koch, Contento, & Castle, 1998). Yet to our knowledge, no hands-on cooking study has explicitly incorporated repeated exposures to the same target foods as ingredients in different recipes over time in an attempt to bolster acceptance of healthy foods. Taken together, there is a robust body of research supporting repeated exposure as an effective method to promote healthier food preferences during childhood, but less is known about whether repeated exposure effects extend to the use of target foods as ingredients during hands-on cooking within naturalistic settings serving lower-income children.

The primary aim of the present pilot study was to examine whether lower-income children's preferences for target fruits and vegetables would increase following repeated taste exposures delivered via hands-on cooking during summer camp. A secondary aim of the study was to describe children's ratings of snacks that they prepared, including their liking of prepared snacks incorporating target fruits and those incorporating target vegetables. Finally, exploratory aims were to examine whether children's liking for the target foods changed over time and whether children's initial liking of target foods predicted whether or not preferences for target foods would increase.

METHODS

Participants

All children from a second grade class at a summer camp in Buffalo, New York, participated in the biweekly hands-on cooking program “Mini-Chefs” run by the research team in 2017. In order for children to be eligible for the summer camp their families had to demonstrate economic need by qualifying for free or reduced-price school meals. At an orientation prior to the start of the summer camp, children from the second grade class were recruited to participate in a research study to assess their liking of and preferences for fruits and vegetables. All children in the class could participate in Mini-Chefs, but only those with parental consent could participate in this research component. Of the 19 children who were consistently present at camp, parents of 18 children completed written consent forms, giving permission for their children to participate in the study. Seventeen of these children had complete data on key variables and make up the study sample. Their ages ranged from 6 to 8 years ($M=7.1$, $SD=0.7$), with 76.5% being girls, 94.1% Black, and 5.9% Latino. Children gave their verbal (< 7 years) or written (> 7 years) assent before participating in the study.

Procedures

All study procedures were approved by the University at Buffalo Institutional Review Board. Study staff visited the summer camp twice per week for six weeks to collect data and host the Mini-Chefs program (Table 1). Each child completed a pre-test assessment of fruit and vegetable liking and preference individually with a researcher. Between the pre-test and post-test assessments, children were repeatedly exposed to target foods during nine exposure sessions that included hands-on cooking and tasting of prepared snacks. Midpoint assessments of liking were also completed for target foods only.

It was planned that five fruits and five vegetables would be tasted at pre-test and post-test, but due to logistical challenges in acquiring one of the foods (pears), nine foods were used: apples, grapes, cantaloupe, nectarines, green bell peppers, broccoli, cucumbers, tomatoes, and snap peas. Most of these foods had been used in prior repeated exposure research with school-age children (e.g., Lakkakula et al., 2011); we made some modifications to selections from prior research based on access to the study foods and the feasibility of incorporating them into planned recipes (e.g., snap peas instead of green peas). Pre-test ratings of the nine study foods were used to identify four target foods: the two least liked fruits and the two least liked vegetables. The least liked vegetables were green bell peppers and tomatoes; they were liked by only one-quarter of the children at pre-test and became the target vegetables incorporated into recipes during exposure sessions. The least liked fruits were cantaloupe and nectarines although all four of the tasted fruits were liked by most of the children at pre-test. Children were exposed to each of the four target foods (bell peppers, tomatoes, cantaloupe, and nectarines) five times across nine different snacks that they made with the help of study staff and ate together as a class. The remaining five study foods (apples, grapes, broccoli, cucumbers, and snap peas) were not included in any of the recipes used during exposure sessions.

Recipe examples include smoothies made with cantaloupe and nectarines and a mini pizza on pita bread with tomatoes and green bell peppers as toppings. During each exposure session, children worked together to follow the day's recipe and assemble the snack, using child-safe knives to cut the fruits and vegetables. Once complete, each child was given a serving of the prepared snack, and children sat together at classroom tables to eat. Research staff walked between tables encouraging children to taste the prepared snack, including the target ingredients (e.g., by saying, "now that we've made our snack, you can all try it together!"). In instances where children were hesitant to try a snack, study staff would use language such as, "if you don't like it, you can spit it out". If a participant did not wish to taste a prepared snack at this point, their refusal was noted. Across the nine exposure sessions, only two participants refused to try a snack. Accounting for refusals and absences, children were exposed to a range of six to nine prepared snacks throughout the exposure sessions, with 88.2% of children receiving at least eight of the nine exposures. After tasting the prepared snacks, study participants reported their liking of each as described below.

As part of the Mini-Chefs program, study staff also occupied the group with games and activities during their one-hour visits. For example, children colored a rainbow of fruits and vegetables or played "Simon Says". During individual liking/preference assessments, a study staff member led activities with all of the children not currently participating in assessments. During exposure sessions, activities took place before and/or after recipe preparation. The children all ate breakfast as part of their participation in the camp program, so they had the opportunity to consume the same foods at the same time prior to all study sessions.

Measures

Familiarity with, Liking of, and Preferences for Individual Study Foods.

At pre-test and post-test, children participated in individual assessments, in which they were provided small pieces of the nine study foods one at a time in a counterbalanced order and rated them by playing the "Tasting Game" (Birch, Zimmerman & Hind, 1980). First, children's familiarity with each food was measured (pre-test only) by asking whether they had the food before and whether they knew what it was called. Next, liking and preference were measured (pre-test and post-test). Standard scripts were used to introduce happy, sad, and neutral face images (e.g., "This face is a really sad face that shows when you don't like something"). To assess liking, children were encouraged to take a small bite of each food and put the remainder back on their plate. Researchers asked the child if the food tasted yummy, yucky, or just OK, and to place their plate in front of the corresponding happy, sad, or neutral face image. Researchers moved the plate behind the specified face. To assess preferences, all of the foods indicated as being yummy were moved back out in front of the child. The researcher then asked, "Which of the foods in front of the yummy face is the yummiest of all the yummy foods?" The child chose one of the foods, and then that food was removed from the table. Next the child was asked, "and now which is the yummiest?", until all foods in front of the yummy face had been removed. Similar procedures were followed for the yucky and just OK foods, resulting in preference rankings for the foods (range=1–9, where 1 was the most preferred food). At both the pre-test and post-test

assessments, all 17 children tried and rated all nine foods (no refusals). In addition, similar procedures were used to assess liking of the four target foods at midpoint (Session 6 of 12).

Liking of Snacks Prepared during Exposure Sessions.

During the exposure sessions, researchers assessed participating children's liking of the snacks that they prepared and tasted. Images of happy, sad, and neutral faces were shown and reviewed, following the scripts used during pre-test and post-test assessments. The class then sat together with their heads down, and study staff asked whether the snack was yummy, yucky, or just OK. Children raised their hands to indicate agreement with one of the three options. Children were told to keep their eyes closed, their heads down, and not to peek or say their answer out loud, so that they would not influence or be influenced by the other children's opinions. Each child was allowed one vote; study staff monitored this and counted only votes given by the children with consent to participate in study procedures. Notes were also included, such as whether children were absent or if anything unusual occurred during the session.

Other Measures.

Parents reported their child's age, sex, and race/ethnicity when completing consent forms.

Statistical Analyses

First, we examined descriptive statistics, calculating frequencies to describe familiarity with study foods at pre-test and calculating medians to describe liking of and preferences for each of the study foods at pre-test and post-test. Then we conducted inferential statistics described herein, with alpha defined as 0.05. We also planned to examine any emergent trends ($p < .10$) to inform future investigations, given the small sample and pilot nature of the research.

Our primary outcome was the change in preference for target foods from pre-test to post-test. Target food preferences were calculated as the mean of each child's preference scores across the four target foods at each of the two time points. At each time point, we also calculated target fruit preference and target vegetable preference as the mean of each child's preference scores across the two target fruits and the two target vegetables, respectively. Similar composite variables were created for liking by aggregating across liking ratings of the target foods.

To test our primary aim, we used the sign test to examine whether preferences for target foods changed from pre-test to post-test. The sign test was selected given challenges in assessing normality in a small pilot sample. If this test was statistically significant or demonstrated a trend, we planned to conduct additional analyses to further inform the nature of any trends by looking at changes in preference for target fruits or target vegetables specifically.

To test our second aim, we calculated the mean percentage of children who rated the prepared snacks as yummy, yucky, or just OK across all of the exposure sessions. We repeated this analysis separately for recipes incorporating fruits and recipes incorporating

vegetables. To test exploratory aims, we used a generalized linear model with generalized estimating equations to test for changes in target food liking across the pre-test, midpoint, and post-test assessments, and we used logistic regression to examine whether children's initial liking of the target foods predicted whether or not they increased preferences for them from pre-test to post-test.

RESULTS

Descriptive Statistics

At pre-test, most children liked the fruits, with more than three-quarters of children rating each of the four study fruits as yummy. Fewer children liked the study vegetables, with about half rating cucumbers and broccoli as yummy and about one quarter doing so for bell peppers and tomatoes. In terms of familiarity, nearly all children were familiar with apples, grapes, and broccoli. For each of the other study foods, less than half of the children reported that they had tried the food before and named it correctly (Table 2).

Changes in Preferences from Pre-test to Post-test

Preferences for target foods (tomatoes, bell peppers, cantaloupe, and nectarines) increased from pre-test (Median=5.8) to post-test (Median=5.5; $p<0.05$). When examining changes in preferences for target vegetables and target fruits separately, results were not statistically significant ($p=0.11$ and $p=1.0$ respectively).

Ratings of Snacks during Exposure Sessions

On average across the nine prepared snacks tasted during the exposure period, 60.1% of the children rated them as yummy, 17.6% as just OK, and 22.3% as yucky. Snacks incorporating fruits were rated as yummy by 62.2% of the children, with 13.9% rating them as just OK and 23.9% as yucky. Snacks including vegetables were rated as yummy by 55.3% of the children, just OK by 23.1%, and yucky by 21.7%. The most popular snack was a "Cracker Stacker" incorporating the target fruits. The least popular snack was a fruit smoothie incorporating the target fruits. Children's ratings of each snack appear in Table 3.

Exploratory Aims

There was no significant main effect of time in the generalized linear model testing the change in liking of target foods ($p=0.55$). Initial liking of the target foods did not predict whether or not children increased their preferences for them from pre-test to post-test ($p=0.27$).

DISCUSSION

Results from this study's primary analysis showed an increase in children's preferences for target foods after repeated exposures to them via hands-on cooking. Children's liking of the snacks prepared during the exposure period supports the feasibility of the present approach, with the majority of children reporting that the snacks were yummy. Exploratory analyses showed no significant change in liking of target foods and no relationship between initial liking of target foods and whether children increased their preferences for them.

The present research is different from other studies utilizing repeated exposure because the target foods were included as ingredients in recipes which contained flavors other than those of the target foods themselves. Flavor-flavor learning is a type of associative conditioning in which target foods are repeatedly paired with already-liked (or disliked) flavors to change acceptance of the target foods alone. Sometimes the pairings are overt and obvious to the children (e.g., serving vegetables with dip), and there is also an emerging literature exploring the effects of incorporating the target foods “by stealth”, in ways that may not be detectable by the child (e.g., de Wild, de Graaf, & Jager, 2017). Most research on the use of these techniques has been done with younger children, and when compared to mere repeated exposure, they tend to show comparable effects (Anzman-Frasca et al., 2018). Here, children were aware of the incorporation of target foods due to their involvement in recipe preparation; target foods were also paired with different flavors for each snack, which is different from typical flavor-flavor learning. While the same flavors were not consistently paired with the target foods in this study, it is possible that pairing the tasting of the target foods with the positive context of the Mini-Chefs program may have functioned as a type of associative conditioning. Including a mere repeated exposure control group in future research can provide insights on the extent to which associative conditioning processes may be operating during this intervention. While a benefit of flavor-flavor learning is that it may be useful in encouraging first tastes in particularly “picky” children, encouraging first tastes was not an obstacle in the present study as no child refused to try any of the individual study foods at pre-test. Given the differences between the current approach and traditional forms of repeated exposure and associative conditioning, more research examining effects of repeated exposure to target foods via hands-on cooking is needed to further understand where this approach fits in the learning literature.

In terms of the feasibility of the present approach, children’s high ratings of the snacks suggest that repeated exposure via hands-on cooking is a feasible way to expose children to healthy foods in community settings. Children enjoyed snacks incorporating fruits as well as vegetables, which is notable as target vegetables were less liked compared to target fruits at the pre-test. Liking of snacks prepared and tasted during the exposure period did not appear to increase over time, which could be due to variability in liking of the taste and/or texture of non-study foods present in the different snacks. Overall, participants were very willing to make and eat snacks containing target fruits and vegetables throughout the study, with only two refusals during the exposure period, highlighting the feasibility of this approach to repeated exposure.

Previous research on repeated exposure has typically been completed in laboratory settings or in schools, with target foods tasted on their own, and participants who refuse to taste target foods are typically excluded from analyses. For example, Lakkakula et al. (2011) found that 25% of the children in their sample refused to try a food during a first exposure session, and 19% of the sample still refused during a second session and were subsequently excluded. Incorporating repeated exposure into the preparation and tasting of mixed dishes can engage children in tasting vegetables and fruits (Hersch et al., 2014) and may prevent the need to exclude a subsample of children, allowing repeated exposure research to apply to and benefit a broader sample of children, including those “picky” children who may need such interventions the most. Because the children in the present sample were all willing to

taste target foods at pre-test, future research is needed to further clarify the extent to which this study's hands-on cooking approach might increase willingness to taste and thus bolster repeated exposure in larger samples.

The small sample size is a limitation of the present study, with constraints due to the summer camp's class size. The pilot nature of this study also precluded assessment of study variables besides those reported herein (e.g., parent-reported information on child characteristics; child liking of the taste and texture of non-study foods used in snacks; child enjoyment of cooking; consumption of the study foods outside of the Mini-Chefs sessions). In addition, target foods started out lower in the preference rankings by design, as the least liked foods were chosen as target foods, and there was no control group in this pilot study. As a result, we cannot conclude with certainty that increases in preferences for target foods were due to the hands-on cooking activities. For example, other activities conducted with the children as part of the Mini-Chefs program or the camp may have contributed to the observed changes. We do note that median preferences did not change from pre-test to post-test for snap peas, which had similar initial liking and familiarity ratings as the target vegetables.

Future studies can build on the present pilot research by incorporating a randomized design, a larger sample size, and more in-depth study measures. Such studies would allow exploration of potential individual differences in effects of this program and would shed light on whether the present study results, including the null results of exploratory analyses, are replicated in larger-scale research. While the present results differ when comparing pre-test to post-test changes in preference versus liking, rank-ordered preference (1–9) was the a priori primary outcome, and our exploratory liking analyses are constrained by the 3-point scale used. In addition, while the original goal was to target disliked foods, all of the fruits tested were initially well-liked (and only four fruits were tested due to logistical challenges in obtaining the additional planned study food, pears). High liking of target fruits at baseline could have constrained possible increases in liking and preference. Ceiling effects have been demonstrated when attempting to increase the liking of an already well-liked fruit, and some researchers suggest that repeated exposure efforts should focus on vegetables or disliked fruits instead (Nicklas et al., 2011). This recommendation fits with public health needs, given that children's intake of vegetables is particularly low, with 93% of children failing to meet vegetable intake recommendations (Kim et al., 2014).

As children's diets continue to stray from recommendations, it is important to identify ways to encourage healthier diets that are efficacious and feasible in naturalistic settings. The present study demonstrates the feasibility of implementing repeated exposure through cooking in community settings serving lower-income children. Utilizing hands-on cooking techniques in summer camp can help with reaching underserved children at a time when they may be more vulnerable to unhealthy behaviors without the structure the school year provides. The observed increase in preferences for target foods supports the initial efficacy of this approach, although randomized studies are needed to ascertain whether the changes observed in the present study were due to the repeated exposures to target foods within the prepared snacks. Results from this pilot study can inform future community-based research and programming aiming to improve lower-income children's acceptance of healthy foods.

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Table 1:

Study Procedures

	Session 1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
Pre-test: study food familiarity, liking, preference	X	X										
Target fruit taste exposures			X	X		X			X	X		
Target vegetable taste exposures			X		X		X	X				X
Mid-point assessment: target food liking						X						
Post-test: study food liking and preference											X	X

Note. Cooking sessions occurred on every fruit and vegetable exposure day, with a different snack prepared and eaten each day. Pre-test assessments occurred during Session 1 or 2, before any hands-on cooking or exposures to prepared snacks, and post-test assessments occurred during Session 11 or 12, after exposures were complete.

Table 2:

Liking, Familiarity, and Preference Ratings for Study Foods

Food	Familiarity at Pre-Test (%)			Liking (Median) ^b			Preference (Median) ^c		
	Yes to both indicators ^a	Yes to one indicator	No to both	Pre-Test	Mid	Post	Pre-Test	Mid	Post
<i>Target Foods</i>									
Cantaloupe	29.4	52.9	17.7	1.0	1.0	1.0	5.0	5.0	4.0
Nectarine	0.0	76.5	23.5	1.0	1.0	1.0	3.0	3.0	3.0
Bell Pepper	41.2	23.5	35.3	2.0	2.0	2.0	8.0	8.0	7.0
Tomato	35.3	35.3	29.4	2.0	3.0	2.0	8.0	8.0	7.0
<i>Other Study Foods</i>									
Apple	88.2	0.0	11.8	1.0	--	1.0	3.0	3.0	3.0
Grape	94.1	5.9	0.0	1.0	--	1.0	2.0	2.0	2.0
Broccoli	94.1	5.9	0.0	2.0	--	2.0	5.0	5.0	6.0
Cucumber	35.3	52.9	11.8	1.0	--	2.0	6.0	6.0	6.0
Snap Pea	23.5	41.2	35.3	2.0	--	2.0	6.0	6.0	6.0

^aFamiliarity indicators were whether children reported that they had eaten the food before and whether they could name it correctly. A yes to both indicators means the child reported having tried the food before and correctly named it. "I don't know" responses were coded as no responses (not having tried the food before, naming it incorrectly).

^bThe possible range for liking scores is 1–3, with 1=yummy, 2=just OK, and 3=yucky. These data were originally collected with higher scores corresponding to greater liking but were reverse coded here for interpretability (i.e. so liking and preference data would be parallel). Midpoint data were collected for target foods only.

^cThe possible range for preference scores is 1–9, with 1 indicating higher preference for that food.

Table 3:

Children's Liking of Prepared Snacks during the Exposure Period

Recipe	Incorporated Target Foods	Liking (%)		
		Yummy	Just OK	Yucky
Skewers	Nectarine, cantaloupe, tomato, bell pepper	46.7%	26.7%	26.7%
Yogurt Parfait	Nectarine, cantaloupe	75.0%	0.0%	25.0%
Turkey Roll-Up	Tomato, bell pepper	52.9%	23.5%	23.5%
Fruit Salad	Nectarine, cantaloupe	69.2%	30.8%	0.0%
Nachos	Tomato, bell pepper	64.3%	21.4%	14.3%
Mini Pizza	Tomato, bell pepper	62.5%	18.8%	18.8%
Cracker Stacker	Nectarine, cantaloupe	81.3%	6.3%	12.5%
Smoothie	Nectarine, cantaloupe	38.9%	5.6%	55.6%
Crackers and Cream Cheese	Tomato, bell pepper	50.0%	25.0%	25.0%

Notes. Recipes are listed in the order they were prepared during exposure sessions at camp. Percentages represent the number of children indicating each liking rating category divided by the total number of study participants who tasted the corresponding prepared snack that day. Across all of the sessions, only two participants refused to try a snack. In addition, there were 14 absences of study participants across the nine exposure sessions. In some cases, totals across liking categories do not equal 100% due to rounding.