

EXPLORING INFANT'S RESPONSE TO SENSORY QUALITIES OF
COMPLEMENTARY FOODS TO INCREASE VEGETABLE CONSUMPTION

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ABSTRACT OF THE THESIS

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Statement of Problem: Infant complementary feedings lay the foundation for lifelong habits and food preferences that promote wellness and prevent chronic disease. Yet few studies exist examining infant food preferences and acceptance. There are no dietary recommendations for infants, as most studies have focused on children over age 4. More studies are necessary to explore infant food acceptance to guide future recommendations to increase fruit and vegetable intake during the introductory period.

Objective: The objective was to examine the association between the sensory qualities of food and infant food acceptance or rejection during the food introductory period.

Methods: A pilot study using a survey questionnaire was designed to assess infant taste reactions to variables of color, smell, taste, temperature, and texture. The study included 18 mother-infant dyads. Infants ranged from 6 to 12 months of age and mothers ranged from 17 to 36 years old. All mothers participated in the Special Supplemental Nutrition Program for Women, Infants, and Children. Mothers indicated whether their infant was

breast or formula-fed. Outcome measures used included mothers maintaining a neutral expression, infant facial expressions and number of spoonfuls eaten as indicators for infants' response to novel food, as well as mothers' and investigators' rating of infant overall reaction to the food. Mothers also rated their infant's preference due to food sensory variables. Any comments or reactions made by mothers which were associated with the feeding were recorded by the lead investigator and one of two research assistants. Descriptive statistics using means, standard deviations, and percentage were used to report infant anthropometric, demographic, and outcome measures. Kendall's coefficient of concordance was also performed to determine inter rater agreement between mother and researchers' ratings of the infant trial baby food.

Results: Mothers reported their babies had little preference for the color of food including green colored foods. Foods that smelled good were preferred by their babies and sometimes, but rarely, smells of food were disliked. Additionally, sweet tastes were preferred by infants over bitter tastes, with the majority rarely disliking bitter tastes. Infants preferred their food to be sometimes at room temperature or warm. Infants also favored smooth textures and disliked chunky textures. Most infants were rated by mothers and investigators as accepting and liking the novel food offered during data collection. Both mothers' ratings of infant food acceptance and investigators' ratings were similar. Method of infant feeding had no bearing on the outcome. Many mothers were surprised their infants ate the food and one mother's personal food bias prematurely stopped the feeding session. Kendall's W findings indicated that all three raters had near perfect agreement.

Conclusions: Formula-fed infants were as accepting as breastfed infants to a novel food. Most infants whose mothers maintained a neutral face accepted a novel green vegetable. Although the study did not test the idea that a mother can limit her infant's exposure to vegetables due to her own food bias, it appears to support this view. Furthermore, this study supports prior work indicating that infant willingness to eat, and not infant facial expressions, should guide feedings because it may take several repeated offerings at meals for the infant's facial expression to change.

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INTRODUCTION

Currently, one in five children worldwide are overweight or obese according to the World Health Organization (WHO) (Commission on Ending Childhood Obesity, 2019). Given lifelong healthy eating habits begin in infancy, in the efforts to prevent excessive weight gain WHO recommends that infants be breastfed exclusively for the first six months of life, after which time supplementary feedings of nutrient dense foods should begin (WHO, 2018). Maintaining a healthy diet, which includes eating a wide variety of nutritious foods, starting at an early age, lays the foundation for lifelong habits and preferences for foods that promote wellness and prevent chronic disease (National Center for Chronic Disease Prevention and Health Promotion, 2020; Nicklaus, 2016). Conversely, poor infant feeding behaviors are associated with childhood obesity that begins in the early years can track through adolescence and adulthood (Geserick et al., 2018). Obesity and unhealthy diets can contribute to diet-related chronic health conditions (e.g., cardiovascular disease, type 2 diabetes and some cancers) (National Center for Chronic Disease Prevention and Health Promotion, 2020); thus, child feeding practices that promote healthy eating may help stem this tide if they are implemented early in the formative years when habits for healthy eating behaviors are being established.

Of paramount importance during this critical time period of rapid growth is infant and childhood nutrition. For the upcoming 2020–2025 Dietary Guidelines for Americans (DGA), there are plans to include, for the first time, recommendations for the specific age group from birth to 24 months (referred to as the Pregnancy and Birth to 24 Months project or P/B-24) (Bailey et al., 2018). The U.S. Department of Health and Human

Services Office of Disease Prevention and Health Promotion and the United States Department of Agriculture, Center for Nutrition Program and Policy are conducting systematic reviews on nutritional concerns for pregnant women and children from birth to 24 months, which will help to formulate the new dietary guidance for this population (Raiten, Raghavan, Porter, Obbagy, & Spahn, 2014). While the majority of children between the ages of 2 to 18 years of age in the United States fail to consume the recommended amounts for fruits and vegetables (F&V) based on the U.S. Department of Agriculture Food Patterns vegetable intake recommendations (Fisher & Dwyer, 2016; Grimm, Kim, Yaroch, & Scanlon, 2014), there is very little information regarding the intake for those under 2 years.

The consumption of F&V as part of a healthy diet contributes important nutrients, phytochemicals, fiber, minerals and vitamins (Grimm et al., 2014). Studies have shown that early introduction to F&V increases the likelihood of continued consumption throughout life (De Cosmi, Scaglioni, & Agostoni, 2017; Forestell & Mennella, 2007; Grimm et al., 2014; Moding, Birch, & Stifter, 2014). Despite the importance of complementary feedings, to our knowledge, there are no best practice recommendations for infant feeding during this period. The new Dietary Guidelines for Americans 2020-2025 plan to have dietary recommendations for infants ages 0 to 2 years (USDA, 2020). Instead, parents or caregivers rely on customs and traditions rather than scientific evidence or documentation for feeding their infants during the complementary feeding period (American Academy of Pediatrics Committee on Nutrition, 2014). Current recommendations by the American Academy of Pediatrics state that complementary feedings should begin at approximately 6 months of age, or as early as 4 months based on

the infant's readiness cues, such as maintaining head control and showing an interest in eating (American Academy of Pediatrics Committee on Nutrition, 2014). While F&V consumption is typically low for children, the Infant Feeding Practices Study II found 17% of infants had already started consuming fruits or vegetables by the age of 4 months (Elieke, Christopher, Jenny, & Victor, 2018).

Food acceptance and preference is equally as important as introducing F&V during the complementary feeding period. Infant food acceptance measures have been largely based on the mother's interpretation of her infant's likes and dislikes, based on behavior or expressions which can often be misunderstood. Therefore, it is imperative that we continue to try to identify what qualities of food infants find appealing or unappealing (Mennella, Reiter, & Daniels, 2016).

LITERATURE REVIEW

In an effort to help explain infant taste aversions or acceptance of newly introduced foods a review of infant studies was conducted. There exist few studies regarding infants and their aversion or acceptance to novel foods, and most studies on food aversion or acceptance in the literature are among children over 4 years of age. The limited studies conducted among infants under 12 months have shown positive associations between F&V intake during complementary feedings with F&V intake throughout childhood and into adulthood (Cont et al., 2019; De Cosmi et al., 2017; Forestell & Mennella, 2007; Gerrish & Mennella, 2001; Harris & Mason, 2017; Moding et al., 2014). Existing data supports that breastfed infants more readily accept a variety of foods due to the flavor learning that occurs through breastfeeding where the mother's dietary intake is reflected in her breast milk (Forestell & Mennella, 2007; Maier-Noth, Schaal, Leathwood, & Issanchou, 2016; Mennella, Reiter, & Daniels, 2018; Scott, Chih, & Oddy, 2012). Although breastfed infants may initially consume a greater variety of foods during the introductory food period, formula-fed infants can learn to like and accept an initially disliked flavor after repeated offerings (Forestell & Mennella, 2012; Maier-Noth et al., 2016; Maier, Chabanet, Schaal, Issanchou, & Leathwood, 2007). The majority of these children continued to like the previously disliked vegetable up to six years later, and also consumed a greater variety of foods (Maier-Noth et al., 2016; Maier et al., 2007). Formula-fed infants can also be introduced to the flavor variety afforded to breastfed infants via breastmilk by adding vegetable purees or broth flavors from cooked vegetables to their formula. Interestingly, formula-fed infants who had vegetable purees

added to their milk, showed greater liking for them than breastfed infants initially did (Hetherington et al., 2015).

Most of the studies on food acceptance examine the child's temperament or sensory sensitivity as it relates to food acceptance. The *Revised Infant Temperament Questionnaire* (Carey & McDevitt, 1978) is designed for 4- to 8- month-old infants, and assesses a dimension called sensory threshold, or how sensitive the infant is within different modalities. However, it groups them together under a global "sensitivity" category and does not assess responsiveness to particular foods, namely, F&V. Forestell and Mennella (2012) reported that infants who scored higher in the approach category (infants' first reaction to new or unusual things) of the questionnaire ate more green beans and showed less distaste for the vegetable. In another study, infant whose mothers rated them lower in approach accepted fewer foods than infants rated higher in approach. Also, an infant's temperaments generally mirrored his or her mother's (Moding et al., 2014) in that mothers who were more responsive had infants who were more accepting of novel foods, and conversely mothers who rated lower on responsiveness had an infant who also rated lower on acceptance of novel foods. But as we have seen from numerous studies mentioned (Forestell & Mennella, 2012; Maier-Noth et al., 2016; Maier et al., 2007) , infants can learn to like and accept a previously disliked food after repeated exposure and offers of the food.

Also, increased food acceptance was found in younger ages (Longflier et al., 2016). Infants three to four months old were more accepting of strong bitter tasting formula than those who were five to six months old and this acceptance of bitter taste continued throughout childhood (Harris & Mason, 2017).

Studies have shown that infants innately prefer sweeter tasting F&V, and as a result are less inclined to prefer the more bitter taste associated with most vegetables (Cont et al., 2019; Forestell & Mennella, 2007; Gerrish & Mennella, 2001; Mennella et al., 2016). Vegetables may not be introduced by the primary caregiver during complementary feedings because as the food gatekeeper of the home, most adults do not meet the recommended daily intake of vegetables (and fruits) (Dietary Guidelines for Americans 2015-2020, 2015); and thus, are unlikely to expose vegetables to their infant due to their own personal food preferences (Spyreli et al., 2019). Several studies note that a new or unappealing food must be introduced multiple times for acceptance by reluctant infants (Birch, Gunder, Grimm-Thomas, & Laing, 1998; Forestell & Mennella, 2007, 2012; Moding et al., 2014) and parents may not have the time, money or inclination to follow this suggestion. The infant feeding guidelines in France recommend infants be introduced to vegetable flavors to promote liking by adding the water used to cook vegetables or even vegetable purees to the infant's milk (Schwartz et al., 2013). Because infants are exposed to a variety of flavors via breast milk through maternal dietary intake, the mother's own cultural flavors, food preferences, and variety will influence her infant's food acceptance of similar foods (Mennella, Jagnow, & Beauchamp, 2001). Parents may also misread infant's reactions to novel foods and assume they are unacceptable to the child. Family and cultural components also may not always favor adequate F&V consumption for infants.

Of the few studies that looked at food acceptance based on characteristics of the food, increased age is associated with a greater acceptance of textures up to 18 months. Introducing a variety of food textures during complementary feedings results in greater

liking and acceptance that increases with age up to 18 months and this learning continues up to the second year (Demonteil et al., 2019; Werthmann et al., 2015). While younger infants preferred smoother textures, infants introduced to lumpy foods before six months of age had fewer feeding difficulties and fussiness at 18 months (Demonteil et al., 2019; Harris & Mason, 2017). Conversely, infants offered lumpy foods after nine months of age showed more resistance and fussiness at seven years of age, ate less F&V, and had more eating difficulties (Harris & Mason, 2017). Historically infants are first introduced to food purees, but is this really necessary or could the infant just as easily be introduced to textured foods? No research has examined this (Rapley, 2016). Infant's palates are easily influenced before the age of 12 months. A sensitive period (4-6 months) is an optimal time for introducing new tastes when flavors are more easily accepted (Harris & Mason, 2017). A critical period (6-12 months) is an optimal time for introducing textures (Harris & Mason, 2017). Children introduced to textures later will have a greater difficulty with acceptance, if they accept the texture at all. This window of opportunity tends to close, at least temporarily, by the age of 2 years which heralds a period of food neophobia (Demonteil et al., 2019; Harris & Mason, 2017; Nicklaus, 2016).

Smell and taste are closely related senses and because we have an innate protective olfactory system to keep us safe (Soussignan, Schaal, Marlier, & Jiang, 1997), foods associated with unpleasant smells usually elicit a negative response (Wagner et al., 2014). However, negative responses to food can be overcome by repeated offerings of disliked foods, especially before the age of 12 months (Birch et al., 1998). Sweet and salty tastes are generally well accepted by infants and interestingly young infants are

indifferent to sour and bitter tastes with most foods being accepted by 5- to 7-months of age (Schwartz, Chabanet, Lange, Issanchou, & Nicklaus, 2011).

Evidence suggests that infants can learn an association between color and attributes of an object (Reardon & Bushnell, 1988). Canonical color recognition (typical color associated with an item) begins at about six months of age and infants can form associations between the color of a container and the taste of the food in it (Kimura et al., 2010).

No data were available regarding infant's preference for complementary food temperatures. However, it is conceivable that breastfed infants may be programmed to be more accepting of warm foods because breastmilk is always warm.

An exhaustive search revealed a gap in objective recording tools available for use in assessing infants' reaction to novel foods, nor are there food intake designs for infants under 18 months (de Lauzon-Guillain et al., 2012). Similar studies used overly-complex and lengthy designs that did not lend themselves to low income and low literacy samples of interest who have limited time to participate in lengthy or multiple questionnaires (Demonteil et al., 2019; Moding et al., 2014). Some studies also videotaped and analyzed the feedings, had specially dedicated rooms to conduct the study, or had restrictions on when infants could eat before or after the feeding. Additionally, several of the studies required training and time commitment that was not possible for this study duration or budget (Demonteil et al., 2019; Forestell & Mennella, 2007, 2012).

This exploratory study seeks to examine factors that influence infants' taste aversions or acceptance to foods during the food introductory period, as well as the

primary caregiver's perception of their infant's acceptability of foods. We anticipated that infants would be hesitant to accept a green vegetable during the food introductory period. It was also expected that infants would not consume more than a few spoonfuls of a green vegetable.

METHODS

A pilot study was designed to first, survey mothers as to characteristics of foods that their infants liked or disliked; and second, to observe the infant's reactions to a test food. Study subjects were infants aged 6 to 12 months who had recently started complementary feedings and their mothers aged 17 to 36 years, who participated in The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) in New Brunswick, New Jersey. WIC is a federal assistance program that provides health care and nutrition support for low-income pregnant and breastfeeding women, and children under the age of five (USDA Food and Nutrition Service). This study was approved by the Rutgers University Institutional Review Board and deemed exempt. Mothers received no monetary compensation but were given a small item for their participation, such as a bib or baby feeding spoon.

During February 2020 through March 2020, a total of 18 mothers of various ages who had infants between the ages of 6 to 12 months and were receiving complementary feedings were recruited for the study. Initial plans for the project called for a sample size of approximately 100 mother-infant dyads, but due to the COVID-19 pandemic, data collection was abruptly halted when the university suspended normal research activities on March 12, 2020. The study was therefore recast as a pilot investigation. Participants were recruited by the investigator during their regular visit to the WIC center where they were asked to fill out an online questionnaire, using an iPad which was provided, pertaining to themselves and their infants. All participants provided informed consent prior to participation, in English or Spanish, as appropriate (Appendix A and B). Only mothers with infants within the 6 to 12-month age range were considered for

participation. Demographic information and anthropometric measurements for mothers was provided by mothers. Infant data was obtained from WIC records (Appendix C and D).

An exhaustive review of tools which measure infant sensory sensitivity was conducted; an unpublished questionnaire on infants' sensory sensitivity as being predictive of F&V intake was selected (Tabatabaei, 2018). This questionnaire was found to be effective in assessing infant taste aversions to variables of color, smell, taste, temperature and texture for our study, and focused on the infant's preference and aversions as they relate to these food variables.

This questionnaire was modified by replacing the "taste" items that focused more on pickiness than taste preferences. The revised instrument assessed infants' current eating preferences as they related to variables of color, smell, taste, texture, and temperature. In addition, mothers used a 5-point scale indicating the response that best described their infant current likes or dislikes for each of the 10 questions about the sensory variables relating food. Response choices included Always, Often, Sometimes, Seldom, and Never (Appendix E and F).


Objective measures were based on an adaptation of a recording tool from a similar study (Moding et al., 2014), and was used by the investigators to record infant reactions to being fed the novel food. Mothers and investigators also recorded their perception of the infant's overall reaction to being fed this test food, which none of the infants had previously tried. *Beech-Nut® NATURALS just spinach, zucchini and peas* baby food was chosen because we wanted to test acceptance of a green vegetable without excess sweetness (2g sugar) (Figure 1).

Figure 1 Test Food



Because no tools for infants' food intake have been designed for rating infants under 18 months (de Lauzon-Guillain et al., 2012; Hetherington et al., 2016), objective recording tools were created for the mothers and investigators to rate infant overall reaction to the novel food and another for use by investigators to record infant reaction to each spoonful. The recording tool created for the investigator to rate infant reaction to each spoon offered (Figure 2), used a format employed in similar studies (Demonteil et al., 2019; Forestell & Mennella, 2007, 2012; Moding et al., 2014). Investigators rated infant reaction to each spoonful with one of three reactions, that is, a negative, neutral, or positive response.






Figure 2 Investigator's Rating of Infant Food Acceptance per Spoonful

	Spoonful							
	1	2	3	4	5	6	7	Total
Negative response – Crying, fussing, whining, physically removing food from mouth or refusal								
Neutral response – A neutral bite in response to the food								
Positive response – Smiling, reaching toward spoon, leaning forward, or opening mouth								
 Rating Scale: total checkmarks per category Note: Offer ends after 3 rejections.								

An additional rating form was developed for capturing infant overall reaction.


This newly created form made it easier for mothers to read and understand in rating their infant's food acceptance. (Figure 3 and Appendix G).

Figure 3 Mother's Rating of Infant's Food Acceptance

My baby's reaction to the food	    				
	Hated (1)	Disliked (2)	Neutral (3)	Liked (4)	Loved (5)
Baby's reaction to the food					
Birth Length: _____ inches	Current Length: _____ inches				
Birth Weight: _____ lbs. _____ oz.	Current Weight: _____ lbs. _____ oz.				
Last 4 digits of phone number:	Date:				

For the objective assessment of infant overall reaction, raters chose one of five emojis indicating their perception of the infant overall reaction to the novel food (Figure 4).

Figure 4 Investigator's Rating of Infant's Food Acceptance

Baby's reaction to the food					
Last 4 numbers of phone:	Extreme Dislike (1)	Disliked (2)	Neutral (3)	Liked (4)	Extreme Like (5)
Baby's reaction to the food					
Weight of jar after feeding:	Length of Feeding Time:				
Investigator's name:	Date:				

The study duration was one session, with participants completing the questionnaire during their wait times at the clinic and participating in the food tasting once they completed their office visit. The feeding procedure used by mothers was adapted from previous studies cited above. Mothers were instructed to offer a spoonful of food to the infant to determine acceptance, while the investigators observed from the side so as not to distract the infants. The infant's response led the feeding session which concluded once the infant rejected the food after three consecutive offers or accepted up to a maximum of seven spoonfuls. Offers of food began with the first spoonful and ended when the next spoonful was presented. When the feeding was concluded, the investigators and mothers each reported how much they perceived the infant enjoyed the food on a 5-point scale. Mothers' rating scale ranged from 1 for "Hated" to 5 for "Loved" (Figure 3). Investigators' scale ranged from 1 for Extreme Dislike to 5 for Extreme Like (Figure 4); higher scores on both scales indicated more enjoyment. The novel food was served at room temperature to control for the possible influence of temperature on

preference. Mothers were instructed to assume a neutral facial expression throughout the feeding so as not to influence the infant's response. A maximum offer of seven spoonfuls was to ensure food acceptance was not influenced by infant satiety. However, mothers had the option of feeding their infant the contents of the entire jar if the infant so desired.

Data Analysis

Analysis of anthropometric, demographic and infants' food intake data relied on descriptive statistics (i.e., means, standard deviations, frequencies and percent). Mean scores were calculated for the ten items on the five sensory variables (i.e., color, smell, taste, temperature and texture) by averaging the scores for each item, with percentage scores calculated to illustrate details of infant likes and dislikes of all sensory characteristics. Inter-rater reliability was conducted to test agreement among the three raters of the trial baby food using Kendall's coefficient of concordance. All analyses were performed in Microsoft Excel, except the Kendall's coefficient of concordance was calculated using SPSS (version 26).

RESULTS

As noted in the Methods, due to the COVID-19 pandemic final recruitment was limited to 18 mother-infant dyads. Fifteen participated in the food tasting. Eight Qualtrics surveys were completed in English and 10 were completed in Spanish. One participant only partially completed the questionnaire but did the food tasting, three participants were unable to participate in the food tasting (one baby was sleeping, one mom had an appointment conflict, and one mom could not complete the interview). For the 17 participants who completed breastfeeding questions, three exclusively breastfed (two for 12 months and one for 6 months), seven infants were formula-fed, and seven received both breast and formula feedings. Breastfeeding duration ranged from three to 12 months (one breastfed for three months, two for four months, two for six months, one for eight months, one for ten months, and three for 12 months).

As indicated in Table 1 for anthropometric information, mothers (N=14) were an average age of 27, ranging from 17 to 36 years. Infants (N=18) were an average age of 9 months old ranging from 6 to 12 months of age. Mothers' body mass index (BMI) which assess a person's weight for height, was calculated taking weight in kilograms divided by height in meters squared. Only 14 mothers provided height and weight information but one was implausible and could not be used.

Table 1 Anthropometric Information

Weight Category	Mean	Standard Deviation	Median
Anthropometric			
Mothers' Age (years) (N=14)	27.07	5.30	26.00
Mothers' BMI (kg/m ²) (N=13)	28.96	7.81	26.04
Infants' Age (months) (N=18)	8.71	2.59	8.00
Infants' Current Weight-for-Age Percentile	58.94	29.15	62.80
Infants' Current Weight-for-Length Percentile	67.86	31.54	83.80
Infants' Birth Weight-for-Age Percentile	57.71	33.55	66.30
Infants' Birth Weight-for-Length Percentile	53.92	41.09	63.70

Using BMI for classifying the mother's weight category, the majority (46.2%) were overweight, followed by Obesity Class I at 23.1%, and Obesity Class III at 15.4% (Table 2). BMIs equal to or greater than 40 are Obese with Class 3 obesity sometimes categorized as "extreme" or "severe" obesity. Both underweight and normal weight mothers were at 7.7% of the sample.

Table 2 Mother's Weight Category

Mother's Weight Category	Range	N	Percentage
Underweight	< 18.5	1	7.7%
Normal	18.5-24.9	1	7.7%
Overweight	25-29.9	6	46.2%
Obesity Class I	30-34.5	3	23.1%
Obesity Class III	≥ 40	2	15.4%

Infants' current weight for age, and weight for length percentiles were determined using the WHO Child Growth Standards online calculators (WHO, 2006). Two-thirds of the infants were girls. As shown in Table 1, average infant percentiles for current weight-for-age (58.94), and current weight-for-length (67.86) indicated most girls were within

normal weight which ranges from the 5th to the 85th percentile. Thirty-three percent of boys and 58% of the girls fell within the normal weight range, and 50% of boys and 25% of girls were overweight, the remaining 17% of both boys and girls scored in the 95th percentile, placing them in the obese category. Infant birth percentiles for weight-for-age averaged 57.71, and weight-for-length averaged 53.92. Most boys and girls fell within the normal range but 33% of boys scored in the ≥ 85 th percentile, placing them in the overweight category. Eighteen percent of girls were overweight and 27% of girls were obese, placing in the ≥ 95 th percentile. As far as current percentiles for infants who placed above the normal range scores, more infants placed in the current weight -for-length category (38.9%) than in the current-weight-for-age (16.7%). Overweight mothers did not necessarily have infants who were overweight. However, the two mothers in the obesity class III category did have babies at approximately the 95th percentile for current weight for length percentiles, but other infants who placed in the overweight percentiles had mothers of normal weight status.

Data provided by the mothers regarding their race and ethnicity (Table 3) found most participants were Hispanic or Latina at 44% followed by Mexican (22%), Black or African American (17%), White (11%), and Asian (6%).

Table 3 Demographic Information

Race/Ethnicity	N	Percentage
Hispanic/Latina	8	44.4%
Mexican	4	22.2%
Black/African American	3	16.7%
White	2	11.1%
Asian	1	5.6%
Total Mothers	18	

Using data from the 18 mothers, mean scores for their infant's food likes and dislikes of sensory characteristics (10 items) (Table 4) as well as frequencies (Table 5) were performed. Lower mean scores indicate agreement with the statement and higher mean scores indicate disagreement with the statement. For example, a mean score of 2.25 for "My baby likes foods that smell good" indicate babies oftentimes preferred their foods to have a pleasant smell or odor.

Table 4 Sensory Characteristics

Category	Mean±SD
Appearance scale	
• My baby avoids foods of a certain color.	4.31±1.01
• My baby dislikes foods that are green.	4.06±1.00
Smell scale	
• My baby likes foods that smell good.	2.25±1.39
• My baby dislikes certain food smells.	3.75±0.93
Taste scale	
• My baby doesn't like bitter tastes.	3.75±1.39
• My baby prefers sweet tastes.	2.69±1.30
Temperature scale	
• My baby likes food at room temperature.	2.38±1.15
• My baby prefers food to be warm.	2.81±1.22
Texture scale	
• My baby prefers foods that are chunky.	4.00±1.03
• My baby prefers foods that are smooth.	2.19±1.33
Likert Score: 1=Always, 2=Often, 3=Sometimes, 4=Seldom, 5=Never	

As shown in Table 5, a majority of mothers reported their babies had little preference for the appearance of color in their foods including green colored foods (44%). In fact, the majority of mothers reported their infants (63%) did not avoid certain colors. Infants preferred foods that smell good (57%) and sometimes disliked certain food smells (56%). Additionally, sweet tastes were always or often (38%) preferred by infants over bitter tastes (always or often = 13%), but the majority seldom (13%) or never

(44%) disliked bitter tastes. Half of infants (50%) preferred their food to be sometimes at room temperature or warm. Infants also favored smooth textures (always or often = 63%) and disliked chunky textures (63%).

Table 5 Infant Sensory Variables Scores

	APPEARANCE		SMELL		TASTE		TEMPERATURE		TEXTURE	
1=Always to 5=Never	Avoids certain color foods	Dislikes green foods	Likes foods that smell good	Dislikes certain food smells	Dislikes bitter taste	Prefers sweet taste	Likes room temp. food	Prefers warm food	Prefers chunky foods	Prefers smooth foods
Always	0%	0%	44%	0%	13%	25%	31%	19%	0%	44%
Often	6%	6%	13%	0%	0%	13%	13%	13%	6%	19%
Sometimes	19%	25%	31%	56%	31%	44%	50%	50%	31%	19%
Seldom	13%	25%	0%	13%	13%	6%	0%	6%	19%	13%
Never	63%	44%	13%	31%	44%	13%	6%	13%	44%	6%

Supplementary feeding data provided by 17 mothers are shown as percentages per month introduced indicating the most common food introductory period. All but one infant who was six months old had begun complementary feedings but the mother said she wanted to start, however due to an appointment conflict she was unable to participate in the food trial. Mothers answered this question as illustrated in Table 6 below.

Table 6 Age Infants Began Complementary Feedings

Months	Number of Infants	Percentage
1	1	5.9%
3	1	5.9%
4	1	5.9%
5	7	41.2%
6	6	35.3%
7	1	5.9
Total Infants	17	

All complementary feedings began between one to seven months of age. The average age for introducing foods other than breast milk or formula was 41.2% at five months (5.06 ± 1.39 SD; Median 5.00), followed by 6-months-old at 35.3%. On average babies were last fed an hour prior to our study. Feeding sessions lasted between 25 seconds to 250 seconds.

Inter-rater reliability testing agreement among the three raters of the trial baby food was conducted using Kendall's coefficient of concordance. Findings indicate that all three raters had near perfect agreement (Kendall's $W = 0.954$). Lead investigator and mother's rating of baby's reaction to the food also found near perfect agreement, with only 3 of the 15 assessments not in perfect agreement.

Novel food tasting ratings for the 15 infants that tasted the food item were examined by calculating mean total scores of mothers and investigators as well as separate investigator ratings per spoonful. Results for the infant's acceptance of the tested food are found in Table 7 below. Overall, the majority of infants liked and accepted the novel food. Of the 15 total tastings conducted for which the infants led the feedings, 10 babies (67%) accepted our maximum offer of seven spoons, with four of them consuming greater than seven.

Table 7 Overall Rating of Acceptance of Novel Food

Rater	Mean	Standard Deviation
Mom	4.00	1.25
Head Investigator	4.07	1.28
Investigator 1	4.33	1.15
Investigator 2	4.00	1.10
Total Spoons Accepted	5.87	1.92
Mom's scale: 1=Hated to 5=Loved		
Investigator's scale: 1=Extreme Dislike to 5 Extreme Like		

Both mother's ratings of infant overall food acceptance and investigator's ratings were similar. Of the infants who accepted two spoonfuls, one mother stopped the feeding convinced her child hated green vegetables, yet she rated infant acceptance a 4 indicating like. Both investigator's ratings were a 4 as well and they thought the infant liked and enjoyed the food and would have continued eating. The other infant came to the food trial already upset and crying from his checkup visit. Therefore, values for the two spoons accepted were not infant-led and artificially inflate the value for dislike. One infant accepted three spoonfuls and was rated as dislike (score 2) by both mom and investigator, and one baby had six spoonfuls, and was rated as loved (score 5) on the scale by both mom and investigator. One infant accepted five spoons yet all acceptance scores rated him at a 3, being neutral. The average number of spoons accepted was six ($5.87 \pm 1.92SD$; Median 7.00). Most of the scores for the highest rating of 5 corresponded to the greater number of spoons accepted which was seven (or more). Investigator's ratings per spoonful can be found in Table 8 below.

Table 8 Spoonfuls Accepted

Offerings	Number of Infants	Percentage
2 spoons	2	13.3%*
3 spoons	1	6.7%
5 spoons	1	6.7%
6 spoons	1	6.7%
7 spoons	10	66.7%
Total Infants	15	
*These results not infant-led		

DISCUSSION

Mothers were WIC participants, thus they are from low-income households. Because the majority of them were Hispanic/Latina and Black/African American, which have the highest obesity rate (Hales, Carroll, Fryar, & Ogden, 2017) their children are more likely to be overweight or obese (Hales et al., 2017). As seen in this study, a significant portion of mothers were overweight or obese 46.2% and 38.5%, respectively. Although the majority of infants were within normal percentiles, this was a small sample size and evidence suggests that obesity affects low-income families more than those with higher incomes, such as our WIC participants (Centers for Disease Control, 2019).

Recommendations are for infants to be breastfed beginning at birth and continue for six months, after which time nutritious complementary foods should be introduced (WHO, 2018). Foods should vary in variety and consistency and the amount should be increased gradually as the infant matures (WHO, 2018). Parental behavior can also have a significant impact during food introduction for several reasons, such as parent food bias likely will limit infant exposure to a variety of foods and by repeatedly exposing children to all foods likely will increase the likelihood of acceptance (Grimm et al., 2014; Mennella et al., 2016; Spyrelli et al., 2019). Of the limited number of studies conducted, an increased food acceptance among infants is associated with repeated exposures to new foods and the timing of food introduction (Forestell & Mennella, 2007; Mennella et al., 2001).

During pre-testing of the recording tools, researchers discovered that the mothers were confused with some of the survey items, so these items were revised to increase ease of use, understanding, and reader-reliability. For example, face emojis were used

because mothers preferred them and, an identifier of last four digits of phone was added to allow matching paper forms with the Qualtrics online questionnaire while maintaining participant anonymity, and the completion date was added. The investigator's form for spoonful ratings was revised to include the weight of the jar after feeding and the duration of feeding, investigator's name, and date. Future uses of this form will reflect identical language for the emojis for both the mother's and investigator's form for standard of comparison. Future survey recommendations would be to have mother and investigator rating scales with identical wording and also when mothers begin the Qualtrics survey, note their last four digits of their phone identification number on the feeding scale instrument because if they cannot complete the feeding, it will allow for easier identification of which Qualtrics survey was missing a feeding rating.

Comments made by some of the mothers indicate that green vegetables are not generally introduced to infants during complementary feedings and most mothers were surprised to see how much their baby ate of the sample food offered. Some of the mothers made comments such as "He ate a lot; he didn't eat a green peas last time". The mother of an infant who emptied the jar was surprised and said, "I thought she wouldn't eat it!" Another commented "Wow! Is it sweet? I'll have to buy!" The mother who stopped the feeding after two spoonfuls commented "she doesn't like green vegetables", however both investigators thought she liked it and would have continued eating and gave a score of 4 for liked, which interestingly was also the score the mother gave. It would be beneficial in future studies to check to be sure the mothers answer the questions as the research intended. Because infant facial cues and behavior disagreed with her statement, this is an example of how a mother's own food preference likely influences

her child's food exposure and environment (Grimm et al., 2014; Mennella et al., 2016; Spyreli et al., 2019). Additionally, it was noticed by the investigators that infant facial cues did not always correspond to food acceptance. This supports research that mothers should not rely on infant facial expressions to assess liking but rather on the infant's willingness to continue the feeding because repeated food offers are necessary before a difference is seen in infant facial expressions (Forestell & Mennella, 2007).

We were unable to give averages per category for Sensory Variables in Table 4, because the direction of the questions were not in agreement. For example, for the Smell category the questions asked about opposite values; one question asked about likes, while the other asked about dislikes. In future studies it would be beneficial for items to be worded in a similar direction within each sensory subscale so an overall average for the category can be obtained.

Formula-fed infants were as accepting as breastfed infants of a novel food. Most infants whose mothers maintained a neutral face accepted a novel green vegetable. Infant willingness to eat, not facial expressions should guide feedings because it may take several repeated offerings at meals for the infant's facial expression to change. Food modeling and positive food attitudes and behaviors will benefit infant's willingness to try new foods.

The small sample size was regrettably, a limitation to this study, which resulted due to COVID-19 pandemic mandates of suspending all but essential workers in an effort to decrease the spread of the disease. Other limitations are that infants likely participated at different levels of hunger, some were tired and some began the food trial already agitated. Asking mothers beforehand not to feed the child for a certain amount of time

would not be possible due to the nature of WIC visits being months apart and this study was one day. Also, the mother's interpretation of her infant's reaction to trying the food may affect the outcome, as was the case with the mother who stopped the trial after two spoons because she was convinced her baby hated green vegetables, despite the investigators' shared belief to the contrary. Objective assessments differ based on interpretation of the observer and may impact feeding session data. Although mothers were instructed to maintain a neutral face during the feeding, some mothers may not have maintained a neutral expression which may have influenced her infant's acceptance or rejection of the food. Results may also be affected by mothers' self-reporting of anthropometric data. Ideally each mother would be led through each question to ensure understanding and completion of questionnaire in its entirety.

The strengths of the study included English and Spanish, in-person recruitment done by investigators who were bilingual in Spanish and present to answer any questions. The Qualtrics online survey made for more streamlined and efficient data collection and analysis. Offering a food trial by infants adds to the limited studies available evaluating infant vegetable consumption. Conducting the study at the WIC clinic allowed for mothers to participate while they waited for their visit and did not interfere with their appointment. Also, future studies in similar settings may benefit from using the easy to use food trial assessment instruments that were created for mothers in this study in a larger sample of mothers with infants.

The Qualtrics questions asking about how the infant was fed, for the two questions pertaining to if you formula-fed as well as if you fed both breast and formula, incorrectly led to a follow-up question asking, "Do you supplement with formula?"

These responses for formula-fed infants were not considered because it would have artificially inflated the supplement with formula subgroup's statistics and should have only been prompted for breastfed only infants. For instance, one answer for a 6-month-old infant being supplemented with formula gave the time period of 17 months which was also not considered, and was recorded as 6 months of supplementation with formula. Future surveys should not advance to this follow-up question.

Future directions should consider offering lessons prior to conception and delivery pertaining to the benefits of introducing vegetables, especially the more bitter cruciferous ones at an early age to promote food acceptance and preference for a lifetime and the value and power of proper food modeling. A future study focusing on the effects of breastfeeding mothers who consume varying amounts of F&V and the effect on their infant's food acceptance could provide insight into food exposure and preferences of infants prior to complementary feedings. Also, studies examining several different test foods would help us to further discover what food qualities infants find enjoyable. Conducting studies where mothers wear a mask to hide their facial reactions while feeding, may lend insight into how infants are influenced by nonverbal cues (Gerrish & Mennella, 2001), and in the current climate which requires mask wearing, infants will not find this practice unusual.

Because early healthy feeding practices can establish lifelong eating patterns and affect long-term health outcomes, it is important to establish healthy dietary practices in infancy. Our results indicated that food color is unimportant to infant's food preference, and that bitter tastes are not disliked, hence it would appear that the introductory food period is an ideal time to repeatedly introduce green vegetables, if originally disliked, as

infants are more likely to learn to enjoy them. Infants' acceptance to foods, namely vegetables, vary greatly due to several factors, including early exposure to an array of flavor through breast milk, cultural and family preferences, parental biases, food availability, and income, for example (De Cosmi et al., 2017; Mennella, Griffin, & Beauchamp, 2004; Mennella et al., 2001; Mennella et al., 2016; Tabatabaei, 2018; Ventura & Worobey, 2013).

Additionally, most studies rely upon the mother's qualitative information as to infant likes and dislikes which are likely biased by the mother's own food preferences, a more accurate measure of food acceptance should include actual food tastings by infants, ideally done after the mother has been trained regarding proper methods of food introduction which include assessing infant behavior and facial cues and the importance of repeated exposure to a variety of foods to promote food acceptance. The WIC setting is not ideal for this type of study because of aging out for infants as well as the lack of continuity because applicants come every three months to the center. A better format would be a dedicated study over a continuous period of time when a variety of vegetable tastings can be observed. Nevertheless, WIC provides a valuable service insofar as it delivers maternal nutrition education related to infant feeding and weaning. Indeed, studies have shown that mothers who receive nutrition education display improved feeding practices and food modeling. Educating mothers on the importance of introducing vegetables at the earliest age is an important step in reversing the obesity trend because the succeeding generation will prefer vegetables which will naturally be passed on to their children and will continue to be beneficial.

With the prevalence of childhood obesity and the associated complications of cardiovascular disease, type 2 diabetes, and some cancers, improving the diet quality of young children is important. Increasing children's exposure to healthy foods such as F&V at the earliest age during the food introductory period may help to improve F&V consumption and thus diet quality. With the advent of the upcoming new Dietary Guidelines for Americans, which will provide information for birth to 24 months, studies assessing methods to increase F&V acceptance in infants can help to provide techniques and tools that parents can use to help their children meet the newly established recommendations. Thus, studying components of infant taste aversion related to variables of color, smell, taste, temperature, and texture, and the caregiver's feeding methods will be beneficial. These findings can be translated into a tool to be used as guidance in feeding infants and can benefit parents by helping to ease the frustration of introducing novel foods to reluctant infants.

While individual tastes and preferences will guide food intake, the critical window of complementary feedings offers an opportunity for infants to expand their palates in ways that will be unavailable in later years. During the food introductory period, infants are acquiring food preferences and behaviors – many of which can be learned – and establishing habits that carryover into a lifetime of eating. Expanding the current body of research to include the influence of color, smell, taste, temperature, and texture using questionnaires, surveys and an objective evaluation, may aid in improving F&V intake. As our study found, parents preconceived ideas of infant food acceptance can limit their exposure to a variety of foods. Also, parents should be guided by their infant's willingness to eat novel foods rather than infant facial expressions which can be

misinterpreted. Repeated offerings will promote greater acceptance. The tools and guidance generated from this research may help infants' and parents' transition to foods easier and may help with feeding guidelines.

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APPENDIX A: INFORMED CONSENT - ENGLISH

CONSENT FORM FOR ANONYMOUS DATA COLLECTION

You are Invited to participate in a research study being conducted by John Worobey, a professor In the Nutritional Sciences Department at Rutgers University. The purpose of this research is to see what makes young infants like or dislike fruits and vegetables. You will be asked to answer some questions, and your Infant will be offered some baby food to taste.

This research is anonymous. Anonymous means that I will record no information about you that could identify you. This means that I will not record your name, address, phone number, date of birth, etc.

The research team and the Institutional Review Board at Rutgers University are the only parties that will be allowed to see the data, except as may be required by law. If a report of this study is published, or the results are presented at a professional conference, only group results will be stated. All study data will be kept for 5 years.

There are no foreseeable risks to participation in this study. In addition, you may receive no direct benefit from taking part in this study.

Participation in this study is voluntary. You may choose not to participate, and you may stop answering the questions at any time without any penalty. In addition, you may choose not to answer any questions with which you are not comfortable.

If you have any questions about the study or study procedures, you may contact me, John Worobey, at Davison Hall, 26 Nichol Avenue, New Brunswick, NJ, 848-932-0937, worobey@sebs.rutgers.edu.

If you have any questions about your rights as a research subject, please contact an IRB Administrator at the Rutgers University, Arts and Sciences IRB:

Institutional Review Board
Rutgers University, the State
University of New Jersey Liberty
Plaza / Suite 3200
335 George Street, 3rd Floor
New Brunswick, NJ 08901
Phone: 732-235-2866
Email: humansubjects@orsp.rutgers.edu

Please keep a copy of this form for your records. By completing the questionnaire, then you agree to participation in this study.

For IRS Use Only. This Section Must be Included on the Consent Form and Cannot Be Altered Except For Updates to the Version

Date.

IRB Stamp Box

IRB Stamp Box

Version Date: v1.0
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APPENDIX B: INFORMED CONSENT - SPANISH

FORMA DE CONSENTIMIENTO PARA ESTUDIO ANÓNIMO

Está invitado a participar en un estudio de investigación realizado por John Worobey, profesor del Departamento de Ciencias Nutricionales de la Universidad de Rutgers. El propósito de esta investigación es ver lo que provoca que a los niños pequeños dejen de gustarles las frutas y vegetales. Se le pedirá que responda algunas preguntas, y se le ofrecerá a su bebé algo de comida para que pruebe.

Esta investigación es anónima. Anónimo significa que NO registrará ninguna información sobre usted que pueda identificarle. Esto significa que NO registrará su nombre, dirección, número o teléfono, fecha de nacimiento, etc.

El equipo de investigación y la Junta de Revisión Institucional de la Universidad de Rutgers son las únicas partes que podrán ver los datos, a excepción de lo requerido por la ley. Si se publica un informe de este estudio, o los resultados se presentan en una conferencia profesional, sólo se indicarán los resultados del grupo. Todos los datos del estudio se mantendrán durante 5 años.

No hay riesgos previsible para la participación en este estudio. Además, es posible que no reciba ningún beneficio directo de participar en este estudio.

La participación en este estudio es voluntario. Usted puede optar por no participar, y puede dejar de contestar las preguntas en cualquier momento sin ninguna penalización. Además, puede optar por no responder a ninguna pregunta con la que no se sienta cómodo.

Si tiene alguna pregunta sobre el estudio o los procedimientos de estudio, puede ponerse en contacto conmigo, John Worobey, en Davison Hall, 26 Nichol Avenue, New Brunswick, NJ, 848-932-0937, worobey@sebs.rutgers.edu.

Si tiene alguna pregunta sobre sus derechos acerca de esta investigación, comuníquese con un administrador de IRB en la Rutgers University, Arts and Sciences IRB:

Institutional Review Board
Rutgers University, the State University of New Jersey
Liberty Plaza / Suite 3200
335 George Street, 3rd Floor
New Brunswick, NJ 08901
Phone: 732-235-2866
Email: humansubjects@orsp.rutgers.edu

Por favor guarde una copia de este formulario para sus registros. Al completar el cuestionario, usted acepta participar en este estudio.

For IRS Use Only. This Section Must be Included on the Consent Form and Cannot Be Altered Except For Updates to the Version


Date.

IRB Stamp Box


IRB Stamp Box

Version Date: v1.0
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APPENDIX C: DEMOGRAPHIC AND ANTHROPOMETRIC INFORMATION – ENGLISH

Mother's Information:		Today's Date:	
Last 4 numbers of phone:	Height: ____ ft ____ in.	Weight: ____ lbs.	Age: ____ yrs.
I consider myself:			
American Indian or Alaska Native	Hispanic or Latino	Mexican	Asian
Asian Indian	Native Hawaiian or Other Pacific Islander	Black/African American	White
Baby's Information:			
Birth Length: ____ inches Birth Weight: ____ lbs. ____ oz.	Current Length: ____ inches Current Weight: ____ lbs. ____ oz.	Age: ____ months	Sex: M ____ F ____
Have you breastfed or formula fed your baby? ____ Breastfed ____ Formula fed ____ Both	If breastfed, for how long? ____ Months Do you supplement with formula? ____ Yes ____ No	Baby food— 1) Have you started feeding your infant baby food? Yes ____ No ____ 2) At what age did you start feeding baby food? ____ mos.	
My baby was last fed: ____ hours ago or ____ minutes ago			
			

**APPENDIX D: DEMOGRAPHIC AND ANTHROPOMETRIC INFORMATION –
SPANISH**

Información de la Madre:		Fecha:	
últimos 4 números de teléfono:	Altura: ____ pies ____ pulgadas	Peso: ____ libras	Edad: ____ años
Me considero:			
Indio Americano o nativo de Alaska	Hispano o Latina	Mexicano	Asiático
Indio Asiático	Nativo de Hawai o de otra isla del Pacífico	Negro/ Afroamericano	Blanco
Información del Bebé:			
Longitud al nacer: ____ pulgadas	Peso de nacimiento: ____ lbs. ____ onz.	Edad: ____ meses	Sexo: M ____ F ____
Longitud ahora: ____ pulgadas	Peso actual: ____ lbs. ____ onz.		
¿Ha amamantado o alimentado con fórmula a su bebé? ____ Amamantado ____ Fórmula alimentada ____ Ambos	Si se amamanta, ¿por cuánto tiempo? ____ Meses 1) ¿Suplementas con fórmula? ____ Sí ____ No	Comida para bebé— 1) ¿Has comenzado a alimentar a tu bebé con comida para bebés? Sí ____ No ____ 2) ¿A qué edad comenzaste a alimentar a tu bebé? ____ meses	
¿Cuándo fue la última vez que alimentaste a tu bebé? _____ horas o _____ minutos			
			


APPENDIX E: SENSORY SURVEY - ENGLISH

Infant's Current Eating Preferences to Sensory Variables					
These questions are about how your baby eats now. Please check the box that best describes your baby's eating habits.					
	<i>Always</i>	<i>Often</i>	<i>Sometimes</i>	<i>Seldom</i>	<i>Never</i>
My baby likes food at room temperature.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My baby avoids foods of a certain color.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My baby prefers foods that are chunky.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My baby likes foods that smell good.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My baby doesn't like bitter tastes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My baby dislikes certain food smells.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My baby prefers food to be warm.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My baby prefers foods that are smooth.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My baby dislikes foods that are green.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My baby prefers sweet tastes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX F: SENSORY SURVEY - SPANISH

Preferencias Alimenticias Actuales del Bebé Respecto a las Variables Sensoriales					
Estas preguntas son sobre cómo come su bebé ahora.					
Por favor compruebe la caja que mejor describe los hábitos de alimentación de su bebé.					
	<i>Siempre</i>	<i>Muchas veces</i>	<i>Algunas veces</i>	<i>Casi nunca</i>	<i>Nunca</i>
Mi bebé prefiere comida tibia.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mi bebé evita los alimentos de cierto color.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mi bebé prefiere alimentos que sean gruesos.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mi bebé le gusta comida que huele bien.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mi bebé no le gustan los sabores amargos.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mi bebé no le gusta ciertos olores de comida.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mi bebé le gusta la comida a temperatura ambiente.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mi bebé prefiere alimentos que son suaves.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mi bebé no le gusta los alimentos que son verdes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mi bebé prefiere sabores dulces.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX G: MOTHER'S OBJECTIVE FOOD MEASURE - SPANISH

Reacción de mi bebé a la comida					
	Odiado (1)	No le gusta (2)	Neutral (3)	Le gusta (4)	Le encanta (5)
La reacción del bebé a la comida					
Longitud al nacer: _____ pulgadas Peso de nacimiento: _____ lbs. _____ onz.	Longitud ahora: _____ pulgadas Peso actual: _____ lbs. _____ onz.				
Últimos 4 números de teléfono:	Fecha:				