EXPLORING PARENT & CAREGIVER KNOWLEDGE, ATTITUDES, AND BELIEFS ON THE INTRODUCTION OF PEANUT AND OTHER FOOD ALLERGENS WITH COMPLEMENTARY FEEDING

by

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(Under the Direction of Alison C. Berg)

ABSTRACT

The 2020 - 2025 Dietary Guidelines for Americans (DGA) include new recommendations to introduce common food allergens around six months when complementary feeding begins and peanuts between four and six months for children at higher risk for peanut allergy (severe eczema, egg allergy, or both). This study aimed to explore knowledge and implementation of these recommendations using three focus groups with parents and caregivers (n = 13) of young children enrolled in Early Care and Education centers in South Georgia (100% female, 82% Black, 72% aged 20 – 29). Thematic analysis revealed four themes (little knowledge, choking fear, reliance on family, and picky eating) and two subthemes (peanuts as most concerning, family food allergy history). This study contributes new information on caregivers' early food allergen introduction knowledge, beliefs, practices, and concerns. These findings can inform subsequent studies and future educational efforts on the early introduction of common allergenic foods.

INDEX WORDS: food allergy, peanut allergy, allergy prevention, parents, caregivers, extension, complementary feeding, Big 9

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DEDICATION

This thesis is dedicated to my friends and family, who have supported me along the way. I will be forever grateful to everyone for their kind and encouraging words throughout this process! I love you all to the moon and back!

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CHAPTER 1

INTRODUCTION

Pediatric food allergy rates in the United States are now at an all-time high. In 2018, it was estimated that approximately 8% of children have a food allergy.R While more than 160 foods are known to cause food allergy-related reactions, only nine are considered common in the United States. [2] The nine leading causes of food allergies in America are peanut, tree nut, fish, shellfish, egg, milk, soy, wheat, and sesame, also known as the "Big 9". [2] Unlike milk and eggs, childhood food allergies like shellfish, fish, tree nuts, and peanuts are likely to persist through adulthood. [3] A food allergy can present numerous challenges to infants and young children, affecting their health, relationships, safety, and autonomy, negatively impacting their health-related quality of life (HRQOL). [4]

Children afflicted with a food allergy report greater incidences of anxiety, depression, bullying, and isolation. [5] Similarly, food allergies place a significant burden on children's caregivers as well as a result of extreme financial burden, anxiety around food preparation, travel, and even mealtime. [6] From 2000 – 2008 it was widely accepted that delaying the introduction of common food allergens, like eggs, peanuts, fish, and shellfish was the best way to prevent food allergies [7] however, research has advanced and now indicates the contrary. Governing bodies and professional organizations like the National Institute of Allergy and Infectious Disease (NIAID), the American Academy of Pediatrics (AAP), and the United States Department of Agriculture (USDA) recommend not only that common food allergens not be avoided under any circumstance[8] but that they also are introduced early and often in the lifespan to reduce the likelihood of the

development of a food allergy. [9,10] Official guidance on the amount (two teaspoons) and frequency (three times a week) has been given for the introduction of peanuts during the complementary feeding phase based on specific risk factors such as egg allergy, eczema severity, or the absence of these conditions [10] which have been supported by research that demonstrated that these recommendations reduce the probability of developing a peanut allergy by a staggering 86%.[11] Moreover, it has also been shown that the protective effect attained from early exposure to peanut was sustained over time. [12]

With evidence building to suggest similar recommendations for early exposure [12-14] and inclusion in the latest DGA 2020, healthcare providers must know and implement food allergy early introduction guidelines. Research following the release of the 2017 Addendum Guidelines from NIAID on early peanut introduction indicates healthcare providers demonstrate inadequate knowledge, [15] report low implementation rates, [16] and report a desire for training on the guidelines and support for implementation in clinical practice and in consultation with parents and caregivers. [16] Little is known about medical provider implementation of the newest DGA 2020 guidelines that include the early peanut introduction guidelines but also extend to the other highly allergenic foods (the Big 9) [17].

As parents and caregivers play a quintessential role in determining the foods that their children consume during complementary feeding thus, it is important for them also to have the knowledge to implement this relatively new and important practice. Little is known about whether parents and caregivers are even aware of the recommendations surrounding early introduction and whether implementation is occurring. [17-21] Previous research on implementation of the 2017 guidelines among parents and caregivers of children with other allergies (e.g.

eczema) indicates that some parents are knowledgeable of the guidelines, and implementation remains inadequate. [19,22]

As nutritional gatekeepers, parents and caregivers may have beliefs and feelings that have developed and been influenced by personal experiences or information from a trusted source that impact their parental feeding practices.

Consequently, this thesis project was one portion of a larger, two-part exploratory study to understand what parents and caregivers know, feel, and believe about introducing common food allergens, particularly peanuts, during complementary feeding. This research is paramount because it gives insight into the facilitators, barriers, and sources that influence this practice and serves as a formative assessment for developing educational programs and strategies to increase the public's knowledge and implementation of these new guidelines.

This sequential exploratory mixed method study begins with this qualitative piece which utilized focus groups. It will be followed by a quantitative portion that utilizes these findings to inform the cross-sectional survey that will be given to a more expansive population. The overarching research questions are:

1. *What do parents and caregivers know regarding the current guidelines for introducing peanuts and other common food allergens during the complementary feeding stage for infants?*
2. *What plays an influential role in guiding the introduction of allergenic foods to infants?*
3. *What are the primary sources of information for parents on complementary feeding recommendations, including the introduction of allergens?*

To explore these questions, focus groups occurred with parents and caregivers who had feeding responsibility for their children and were enrolled in an early childcare and education (ECE) center in South Georgia. A focus group interview guide was designed by the research team to guide the exploration of parent and caregiver beliefs on introducing allergenic foods

during complementary feeding, awareness of the recommendation on early introduction, and sources that influence how they feed their child. This study had the following three aims:

- Aim 1. Determine parents' and caregivers' awareness and knowledge of the early introduction of allergenic foods with complementary foods. *It was hypothesized that parent and caregiver awareness and knowledge of the early introduction of allergenic foods during the complementary feeding stage for infants would be low.*
- Aim 2. Explore parents' and caregivers' beliefs of the early introduction of allergenic foods to their infants. *It was hypothesized that parental and caregiver fear would be the primary reason this group would be cautious about introducing peanuts and other common food allergens to children. Also, infant willingness to consume common food allergens would be a reason that parents and caregivers would be unlikely to introduce peanuts and other common food allergens early and often.*
- Aim 3. Identify sources from which parents and caregivers receive information on what foods and when to feed their infant. *It was hypothesized that family members will play the most influential role in the guidance of introducing peanuts and other food allergens to infants.*

This study is innovative in that to our knowledge, this is the first of its kind to use a qualitative approach to explore these topics with parents and caregivers. This work is significant because the results of the present study, in conjunction with the results from the larger parent study, can be used to inform educational efforts and public health policy and identify necessary partnerships and subsequent studies that are critical for reducing the food allergy burden in the United States.

This thesis consists of four chapters. This first chapter serves as an introduction to the project, research questions, hypothesis, and specific aims. The following chapter (chapter 2) is a review of the literature on current food allergy rates, the significance of peanut allergy, the evolution of guidance on early introduction, current knowledge and implementation of the early introduction guidance, and influential sources in parent and caregiver infant feeding practices. Chapter 3 is a manuscript in preparation for submission to the *Journal of Nutrition Education and Behavior*, Exploring Parent and Caregiver Knowledge, Attitudes, and Beliefs on The Introduction of Peanut and Other Common Food Allergens With Complementary Feeding. Finally, chapter 4 is the concluding chapter that reflects the findings and applications of the study.

CHAPTER 2

LITERATURE REVIEW

Introduction

Over 160 foods are known to be responsible for food allergy-related reactions, all with different prevalence rates and populations affected.[23-25] The United States Food and Drug Administration (FDA) considers nine major food allergens (peanut, tree nut, fish, shellfish, egg, milk, soy, wheat, and sesame), accounting for over 90% of food allergies in the USA.[2] A 2015 – 2016 parent-reported household survey of children aged 0 – 17 years old (n = 38,408) revealed that the most common food allergens among children were peanuts (2.2%), milk (1.9%), shellfish (1.3%), tree nuts (1.2%), and egg (0.9%) with peanut dominating all parent-reported food allergies.[1] Childhood food allergies like peanuts, tree nuts, fish, and shellfish are more likely to continue into adulthood than egg and milk.[3] Notably, food allergies are more common in males than females during childhood, with female predominance occurring during adulthood.[26] Some suggested reasons for these differences in gender are hormonal changes during significant developmental periods (puberty, pregnancy, and menopause), obesity, and even the gut microbiome.[26] Epidemiological data also indicates a higher prevalence rate and a more significant burden on people of color, particularly African Americans.[25,27-29]

There are many challenges in estimating food allergy prevalence.[3,30,31] Studies vary in methodology, definition and measurement of food allergy, and sample demographics. Moreover, allergies can develop and resolve over time, which makes estimating prevalence challenging. In the U.S., most estimations of this disease originate from self-, or parent-report of allergy

compared to observed clinical diagnoses via oral food challenge, skin prick test, blood test, or some combination or medical record review.[32] Some methodology, such as that used in the National Health Interview Survey (NHIS), asks respondents to report if they have "an allergy to one or more foods" and if they have "ever been told by a doctor or other health professional that [sample child] had an allergy to one or more foods.".[29] Participants must respond "yes" to both questions. This survey is a primary source of US food allergy prevalence data from a representative sample. The NCHS data support the prevailing belief that food allergy is increasing among children, with an estimate of 2.9% in 1997, 3.9% in 2007[33], and 5.8% in 2021.[29] Other research suggests that food allergy prevalence could be as high as 8% in children[34] and 11% in adults.[34] Regardless of measurement challenges and inconsistencies, there is consensus in the literature that pediatric food allergy prevalence is increasing globally and is at an all-time high in Westernized societies, where some studies indicate prevalence as high as 8%.[29,34]

Food allergies represent a significant burden to patients due to their impact on physical health and quality of life.[5,6] Even minuscule amounts of a food allergen can cause an allergic reaction that can vary in severity and location.[35] Exposure to an allergen can potentially cause a systemic reaction known as anaphylaxis, which is treatable only by injectable epinephrine, can be fatal, and represents the greatest risk to children and adults living with a food allergy.[36] New therapies, such as sublingual and oral immunotherapy, are being developed to help increase tolerance of specific food allergens, but currently, there is no cure for food allergy.[37] Therefore, strict avoidance is required to manage food allergies.[30]

Prevalence and Burden of Food Allergies in Children

Milk, egg, and peanut are the three most common food allergies, afflicting children, with peanut being the least likely to resolve in childhood compared to other food allergies. [1,38] Peanuts, along with tree nuts, are the most common food allergens responsible for fatal food anaphylaxis in children, representing approximately 44% to 83% of fatal anaphylaxis cases in children. [39,40] A descriptive study conducted by Sampson and colleagues reviewing emergency medical records and reports found that 83% of the 6 cases of fatal anaphylaxis in children younger than 6 were due to peanuts and tree nuts. [41] Another descriptive study conducted by Bock and colleagues [42] utilizing a registry from members of the American Academy of Allergy, Asthma & Immunology and The Food Allergy and Anaphylaxis Network reported 31 fatalities as a result of anaphylaxis between 2001 – 2006 with 44% of those deaths being caused by peanut and tree nuts. [42] Although individuals may aim to avoid them, unexpected exposure to food allergens can still occur due to mislabeling foods, cross-contact, and being unaware of food ingredients at social events or restaurants. [38] Living with a food allergy can burden children and their caregivers daily, significantly impacting their quality of life. [43]

While challenges remain in accurately documenting food allergy prevalence, food-related anaphylaxis events, and fatalities from food-related anaphylaxis, it cannot be argued that this life-threatening reaction presents a significant threat to individuals living with any food allergy, especially peanut and tree nut allergies. Moreover, the day-to-day management of food allergies can represent a significant burden. For example, a recent study of adults, adolescents, and caregivers of children living with peanut allergy indicated significantly worse outcomes across several domains of physical and emotional health. [43] Approximately ¼ to 1/3 of respondents indicated that peanut allergy interferes "very much or completely with their day-to-day life.

Moreover, adolescents in the study reported worse quality of life overall than healthy US samples. Interestingly, just like the children, the caregivers also reported lower scores in the areas of mental and physical health. [6] Overall, when assessing pediatric quality of life and caregiver quality of life, it was demonstrated that peanut allergies negatively affected allergy-specific and general HRQOL. [5,6,44] Overall, children afflicted with a food allergy report greater incidences of anxiety, depression, bullying, and isolation. [5]

Food allergies place a significant burden on children's caregivers as well in the form of financial burden and anxiety around food preparation, travel, and even mealtime. [6] The socioeconomic impact that peanut allergies have on children and their families, as well as the healthcare system, is immense. [45-48] One study that utilized a cross-sectional survey of the U.S. to assess the overall cost of childhood food allergy found that the economic impact was estimated to be $24.8 billion annually (~4184 per year per child). [45] $4.3 billion were attributed to direct medical costs (clinician visits, emergency departments visits, and hospitalizations), $20.5 billion were attributed to costs borne by the family (lost labor, productivity, out-of-pocket, and opportunity costs).

Evolution of Food Allergy Guidance and Recommendations

Until 2008, the American Academy of Pediatrics (AAP) recommended delaying the introduction of common allergenic foods like milk, eggs, peanuts, tree nuts, and fish until 1- 3 years of age, depending on the food. [7] This advice was based on the opinions of experts due to the lack of clinical trials at the time, but since then, research has evolved to show that introducing allergenic foods early and often is more effective at preventing food allergy than avoidance, particularly among those at high risk for allergies. [49,50] In 2010, the National Institute

of Allergy and Infectious Diseases (NIAID) released clinical guidance for the diagnosis and management of food allergy in the United States [30] while one year later, providing a summary of the most pertinent content for the pediatric population. [51] In this summation, the NIAID explains that diets through pregnancy and infancy should not be restricted of any potentially allergenic foods, and that the introduction should occur any time after solid food introduction has started. [51]

New Evidence for Peanut Allergy Prevention. In 2017, the NIAID developed recommendations [10] to introduce peanuts to infants early and often based on data that indicated an 86% risk reduction of food allergy development with early introduction among the higher-risk infants. [11] The LEAP study randomized 640 children between the ages of 4 – 11 months with severe eczema, egg allergy, or both to avoid or consume foods that contain peanuts until 60 months of age. An oral food challenge (OFC) was then conducted to determine the development of a peanut allergy. Data from this study also indicated that severe eczema and egg allergy are important risk factors for monitoring for peanut allergy. As eczema increased from mild to severe, the likelihood of a reaction also increased. The connection between egg and peanut allergy sensitization is likely due to similar risk factors for food allergy, like severe eczema. The Leap-On study [12] a 12-month follow-up from the original, demonstrated that the tolerance attained from early exposure was endured over time. An analysis also showed no negative impact on the children's development or breastfeeding time. [12] The NIAID recommends that infants with severe eczema, egg allergy, or both be introduced to 6-7 grams of age-appropriate peanut-containing food three times or more a week as early as 4 to 6 months to reduce the risk of peanut allergy. [10]

Prevention of Other Food Allergies. As evidence for peanut allergy prevention with early introduction was building, several studies sought to examine early exposure to other common

allergenic foods, like eggs and milk, to prevent the development of an allergy. A trial examining the early introduction of eggs to reduce food allergy prevalence, the Prevention of Egg Allergy with Tiny Amount Intake Trial (PETIT), resulted in a significant reduction (92%) in the development of egg allergies. [13] A longitudinal observational study called the HealthNuts Study [14] exposed 5276 infants early to cow's milk in the first three months of life, reducing sensitization to a cow milk allergy at one year of age.

Some studies have even explored the concurrent early introduction of multiple allergenic foods. The Enquiring About Tolerance (EAT) study [52] randomized 1303 infants and introduced them to six allergenic foods (wheat, fish, sesame, cow's milk, egg, and peanut) at 3 or 6 months of age. Despite the high rates of non-adherence to dietary protocols, a significant reduction in egg (98.6%) and peanut allergies (100%) was also observed in the 3-month age group that consumed 2g of food per week. In a similar study conducted recently in Japan, the SEED trial [53], 163 infants were randomized to either a mixed allergenic powder (peanuts, buckwheat, soybean, wheat, milk, egg) or a placebo powder. Throughout the trial, the amount of powder given was increased over 12 weeks. Following this intervention, the incidence of egg allergy episodes was reduced at 18 months old in participants with sensitization to eggs and without by 19.6% and 3.2%, respectively, in the intervention and control groups. Overall, research indicates that early introduction of food allergens during the complementary feeding phase (around 6 months and before 12 months), particularly peanuts, eggs, and milk, may reduce the risk of developing a food allergy.

New Food Allergen Introduction Guidance: the 2020-2025 Dietary Guidelines for Americans. As a result of this body of research clearly indicating a reduction of peanut allergy with an early introduction, emerging evidence for other food allergies, particularly egg and milk,

and the absence of evidence to suggest that avoiding allergenic foods decreases food allergy risk [10,13,52,53], the United States Department of Agriculture (USDA) released new guidance on introducing infants to food allergens as part of the complementary feeding process in 2020. The 2020-2025 Dietary Guidelines for Americans 54 was the first issue of the DGA to address feeding for children from birth to 24 months, pregnancy, and lactation life stages. 54 Notably, this guidance indicates that pregnant and lactating women need not avoid likely food allergens and that they include these food allergens as part of their diet according to their own dietary, cultural preferences, and medical needs. For infants, the DGA 2020 provided specific guidance on when to introduce food allergens during the complementary feeding phase. Specifically, the DGA states:

- ***"Potentially allergenic foods (e.g., peanuts, egg, cow milk products, tree nuts, wheat, crustacean shellfish, fish, and soy) should be introduced when other complementary foods are introduced to an infant's diet. Introducing peanut-containing foods in the first year reduces the risk that an infant will develop a food allergy to peanuts."*** (Page 58)

Healthcare Provider Implementation of Peanut Allergy Prevention Recommendations

Due to the relatively recent evolution of how allergenic foods are to be introduced, with specifications of amount and frequency being provided for peanuts, it is paramount that healthcare providers, specifically pediatricians, nurse practitioners, and allergy specialists, are aware of the existence of these recommendations but are also knowledgeable about how they should be implemented to help reduce the incidence of food allergies. Notably, there are several

studies that have sought to assess pediatricians' knowledge and level of implementation since the release of the NIAID's recommendations on peanuts.[15,16,55]

One study, one year after the release of the 2017 guidance, sought to gauge if there was a gap in provider knowledge using a 2-part online survey. [55] Part one assessed healthcare providers' (pediatric attendees and nurse practitioners) knowledge of the NIAID recommendations for the prevention of peanut allergy. In contrast, part two assessed pediatric residents' knowledge of the NIAID recommendations for the prevention of peanut allergy. Notably, only the pediatric residents received an educational intervention where comprehension of the recommendations was assessed pre- and post-educational intervention. This intervention consisted of an in-person food allergy presentation that included the recommendations and information on the LEAP study. In both parts of the study, five different case-based scenarios in the survey assessed participant's self-confidence in addressing conditions related to allergies and questions about the appropriate intervention relative to the guidance provided by the NIAID. Only 12% of healthcare providers (~7) answered 5 of 5 scenarios correctly, and only 17% of healthcare providers (~10) answered 4 of 5 scenarios, meaning more than two-thirds of healthcare providers within this study are unable to properly apply the recommendations provided for the early introduction of peanut. Only 21% of residents (~7) answered 4 of 5 scenarios correctly pre-educational intervention, and a significant improvement of knowledge was observed post-educational intervention, with 83% of residents (~25) answering 4 of 5 scenarios correctly. A total sample size of 60 providers in part one, along with 33 (pre-survey) and 30 (post-survey) pediatric residents in part two, with a completion rate of 44% and 55%, respectively, the study suggests that most providers are not proficient in applying the

recommendations and an in-person educational intervention could be effective in bridging this gap.

Similar results were reported in another study conducted around the same time. Researchers evaluated the knowledge and practice of the early introduction recommendations among primary care faculty and staff (nurse practitioners, physician assistants, residents, and medical doctors). [15] Out of the 210 clinicians who responded, less than 50% were aware of the update to the recommendations. Through the utilization of multiple-choice case-based questions, it was revealed that 40% of participants believed that the earliest age for early introduction of a high-risk infant was greater than 1 year of age. Shockingly, only 8% of the participants reported reading any part of the recommendations or the summary released within the same year.

Five years after the release of the NIAID recommendations, Gupta and colleagues [16] identified that less than one-third (29%) of pediatricians reported fully implementing the peanut recommendations, representing a significant missed opportunity to address the growing food allergy epidemic. [16] Furthermore, only 64.3% of pediatricians reported that they were partially implementing the recommendations. [16] Physicians cited a lack of clinic time and a need for more practice aids and office materials to facilitate implementation of the recommendations to parents as some of the barriers to full implementation. Some materials that pediatricians preferred to utilize to aid in explaining the recommendations were printed or electronic handouts, printed or electronic scripts for explaining the recommendations, and even an online tutorial on guideline implementation. [16] Clearly, physicians need multilevel support to help improve overall knowledge, practice, and dissemination of this information due to the barriers they face.

Impact of Provider Training on Implementation. With the combination of low implementation rates, low knowledge, and reports of an increased need for training, researchers

are investigating strategies to assist healthcare providers. The Intervention to Reduce Early (Peanut) Allergy in Children or iREACH study [56] utilized a 2-group cluster randomized clinical trial seeking to increase provider adherence to the guidelines through a professionally developed training video that provided an overview of content about peanut allergy prevention, NIAID recommendations, interventional tools, and categorization of eczema. An online pre- and post-training survey was administered to all participating pediatricians (185 clinicians; 100% completion rate) at 16 different intervention practice sites. Most clinicians reported previous awareness (89.7%), and 68.7% reported no prior training. When looking at differences in knowledge and guideline application questions, there was an increase of 21.9% and 29%, respectively. These results suggest that this training and potentially others like it could be an effective means to facilitate guideline knowledge and implementation for peanut allergy prevention among clinicians.

To further evaluate the materials utilized in the iREACH study [56], the analysis and effectiveness of its materials (educational YouTube video and knowledge survey) were assessed among pediatric clinicians. Researchers produced suggestions for developing an innovative curriculum centered around best practices. [57] Viewing the behavior of the training video through downloaded analytics from YouTube, where the iREACH team posted it, revealed it to be suboptimal. Out of the 185 total participants, there were 143 views of the video, some of which could have been from one participant reviewing the video multiple times. The average duration of the video was 3 minutes and 27 seconds, which raised concerns.

In a needs assessment survey, more than 90% of pediatricians felt that the educational curriculum effectively addressed the early introduction recommendations for peanuts. When asked about the viewing behavior of the training video, less than half of respondents (46.6%)

reported watching the video through completion and being mindful while watching, and 43.2% reported speeding up the video or performing other tasks while watching. The overall length of the video and how the information was presented were the least liked components of the training, while the photographs of patient eczema and patient case animations were the most desired. Researchers also conducted a focus group with four pediatricians.: the value of quality media production, the utility of content segmentation, and the importance of broad accessibility. A new curriculum was developed by utilizing respondent feedback from the needs assessment.

The new curriculum incorporated updated knowledge questions, interactivity within the provided media, and re-usage of practical clips from the iREACH training video. Researchers note that the following steps will include implementing and evaluating the curriculum with each study participant, where randomization will occur to compare the two pieces of training. Doing this will allow researchers to assess which is the most effective in causing a change in knowledge, increasing engagement, and providing overall satisfaction with the content received. The results of these studies can inform future educational programs and strategies for providers. However, it is important to note that these interventions were specific to peanut introduction and did not include the prevention of other common food allergens.

Parent and Caregiver Knowledge and Implementation of Early Introduction Food Allergy Prevention Guidelines

Children, particularly infants, rely on their parents and/or caregivers to be informed of the recommendations for allergy prevention to help reduce their risk. Parents and caregivers are also responsible for educating those who help look after their children, like friends, families, and childcare staff. However, whether the general population is aware of these recommendations is

unknown. Moreover, there is little data on complementary food introduction practices in the U.S. to evaluate current implementation. [17-22]

Food allergen introduction prior to the release of the 2017 NIAID Guidelines. The Feeding Infants and Toddlers Study (FITS) of 2016 was a three-phase study and the largest in the United States to examine the dietary intakes, including the intake of major food allergens, meal and snack patterns, physical activity, and other behaviors of infants and toddlers during a critical phase of growth and development. [58] This cross-sectional study of caregivers with children under four years old (n = 3235) took place before the release of the 2017 addendum guidelines. The survey included a nationally representative sample with size targets for age and participation in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) program. Participants were provided tools (a ruler, a measuring cup, and a *Food Measurement Aids* booklet) to assist with accurate reporting of food and beverages. The trained research team conducted the two separate 24-hour recalls by phone and used the Nutrient Data System for Research (NDSR) 2015 to collect dietary recall data, dietary supplement data, and nutrient content.

A secondary analysis of FITS 2016 data that focused on food allergy introduction [18,58] revealed caregivers of all age groups (0 months – 47.9 months) reported their child's consumption of egg and egg-containing foods to be greater than peanut and peanut-containing foods. Less than 1% of children under 9 months of age had consumed peanuts; by 12 months, only 5% and 31% of infants were consuming peanut and egg-containing foods, respectively. This behavior generally aligns with earlier guidance to intentionally avoid [30] peanuts during infancy and young childhood. Interestingly, some parents and caregivers who reported an attempt to avoid peanut or peanut-containing foods in their child's diet also reported that their

infant consumed peanuts or peanut-containing foods in their diet recall. Of note, in the children who truly did not consume peanuts through review of their dietary recall, intentional avoidance occurred in 6.5% of the 4 to 5.9 months of age group, 14.2% of the 6 to 8.9 months of age group, and 16.9% in the 9 to 11.9 months of age group. Of those not consuming peanuts, 3.8% of those aged 36 to 47.9 reported having a peanut allergy. This age group had the highest self-reported peanut allergy. Overall, the FITS study data revealed very low allergen introduction among US infants before the release of the 2017 Addendum Guidelines and the 2020 DGA. It also revealed that the intention to avoid or not avoid food allergens does not always align with actual behavior.

Food allergen introduction and guideline awareness after the release of the 2017 NIAID Addendum Guidelines. In April 2017, three months after the release of the NIAID's recommendations for early peanut introduction, researchers conducted a survey of men and women aged 18 to 55 years old who had a child 12 months or younger and/or were pregnant (n = 2,000).[21] The 32-question survey developed by the research team included questions that assessed knowledge, attitudes, and preferences about the timing of the introduction of solid foods, awareness and comprehension of possible food allergy development, perspectives on healthcare provider recommendations about potentially allergenic solid foods, and in-office procedures for assessing potential allergic reactions. The population was skewed intentionally based on respondent age, sex, and marital status. It included 53.1% of participants who reported having at least one family member (primary relative) with a food allergy.

A little less than half (42.6%) of respondents reported strong familiarity with the recommendations, and less than one-third of the sample (29%) reported no or limited awareness of the early peanut introduction recommendations. More than half of respondents (53.7%) felt that the recommendations were of little to no importance, while 40% felt that the

recommendations were exceptionally important. Most of the sample (61%) had minimal or no concerns about their child developing a food allergy. Pregnant women were 1.6 times more likely (odds ratio [OR], 1.6; 95% confidence interval [CI], 1.2–2.02; $P < .001$) to express concerns for allergy development and 1.3 times more likely to believe that the timing of the introduction was important (OR, 1.32; 95% CI, 1.05–1.7; $P = .02$) vs those who recently delivered (OR, 1.4; 95% CI, 1.1–1.9; $P = .01$). Interestingly, while family history was associated with 2.5 times the odds of concern for the development of a food allergy (OR, 2.5; 95% CI, 1.8–3.5; $P < .001$), parents and caregivers with a family history of food allergy were only slightly more likely than their counterparts without family allergy history to be aware of the recommendations (OR, 1.2; 95% CI, 1.02–1.49; P = .03) and believe that timing is important when introducing for the development of a food allergy (OR, 1.2; 95% CI, 1.03–1.46; P = .02).

Almost one-third (31%) of caregivers were willing to introduce peanuts around the time of the recommendations (4 - 6 months), and increased willingness to introduce was observed when asked to introduce peanuts after 11 months of age (40%) with the same being observed for tree nuts and seafood. When asked about caregiver willingness to allow their child to undergo in-office allergy risk assessment to facilitate early allergen introduction, more than half (51%) were unwilling to allow the skin-prick test before 11 months, and even more (56.8%) would allow an oral food challenge before 11 months. Overall, 58% of the entire sample showed support for the medicalization of introducing potentially allergenic solid foods early in children's diets through a risk assessment of an infant, with 28.1% stating they would not support this and 13.6% reporting that they would do what was recommended by their physician.

A 2019 study using a convenience sample of 100 parents revealed more than 58% of parents reported being aware of the guidelines. [22] Among the 58% of guideline-aware parents

with infants older than 6 months of age (n = 32), only half (53%) had fed their child peanuts. When considering all parents with children older than 6 months (n = 46), 37% had fed their children peanuts, and the proportion of fed peanuts increased to 64% in children aged 9 – 12 months. [22]

Venter and colleagues [19] found that among a survey of caregivers with children between 7 months and 3.5 years old, 48.1% reported introducing at least one of the 9 most common allergenic foods, with only 0.4% introducing all of the major allergens. [19] Only 17.2% of parents had introduced peanuts by 7 months, which increased to 58.8% by 1 year. Caregivers who reported introducing peanuts to their children were also asked what peanut-containing foods they offered their child during the first month they initially decided to provide them. Alarmingly, 1783 (64.5%) respondents provided their child < 7 months with only plain peanut butter, not thinned with any additional liquid or puree, and this introduction seemed to predominate amongst children who were introduced before 13 months and those introduced after 12 months.

Other studies have reported that most caregivers are unaware of the early introduction guidelines and that even fewer are introducing peanuts to infants according to the recommendations. Samaday et al. [20] reported that 87% of parents and caregivers surveyed were unaware of the guidelines, yet almost half (47.7%) believed that introducing peanuts early to children prevented peanut allergies, and 33.5% selected "Don't Know" when asked if introducing peanuts early prevented peanut allergies. Interestingly, when parents who reported being guideline aware were asked about when it would be safe to feed peanuts to their children, only 7.9% of all respondents said before 7 months, 24.4% said 7 and 9 months and 22.7% said between 10 and 12 months with no differences between those who were responsible for taking care of children with eczema. Almost half of all respondents (47.1%) said they were worried

about food allergies in general when beginning to feed their infant, with 35% of these responses being attributed to specifically developing a peanut allergy. Guideline-aware caregivers were more worried about food allergies overall compared to unaware caregivers. An increase in peanut introduction at 6 months was noted over the years after the release of the recommendations, with 12% of children being given peanut-containing foods in 2017, 15% in 2018, 20% in 2019, and 25% born any time after the year of 2020.

The primary reason caregivers reported giving their child peanuts after the age of 7 months was fear due to allergic reactions (32.5%), with the belief that early introduction was not important (31.7%), following as another top contender for not introducing at that time. The main reasons for feeding peanuts after 12 months were the belief that introduction was not important (32%), fear of a reaction (29%), and guidance from PCP (26%). Allergic reactions to peanuts were reported to be 1.4% of all those who were initially introduced. Some reported symptoms for infants that experienced a reaction (> 12 months old) were primarily dermatologic being hives (56.2%), rash (45.6%), itching (42.6%), swelling (32.1%), and flushing (28.8%).

Taken together, these data suggest that several years after the introduction of the new recommendations surrounding early peanut introduction, caregivers show inadequate knowledge of the guidelines for early introduction, limited implementation, and potential misinformation about how to introduce peanuts safely to infants.

Receptiveness to Early Introduction Guidelines. Parents and caregivers report varying levels of comfort in introducing food allergens, particularly peanuts, to their infants, and trusted sources of information vary. Lai and Sicherer [22] indicated that 90% of parents reported they were comfortable with the concept of early introduction of peanut-containing foods. Pediatricians (30%), the internet (19%), and friends (14%) were the most common sources of the information.

The barriers parents perceived to be the greatest when introducing peanut foods were fears of reactions (36%), choking (11%), and lack of infant-friendly forms (6%). In order to overcome these barriers, parents cited a need for additional advice from physicians (44%), brochures (24%), and access to allergists (18%).

Samady et al. [20] found that 57.8% of respondents reported that they did discuss introducing peanuts with their primary care provider (PCP), but a great majority (73.9%) said it was after 6 months of age. The primary reason caregivers reported giving their child peanuts after the age of 7 months was fear due to allergic reactions (32.5%), with the belief that early introduction was not important (31.7%), following as another top contender for not introducing at that time. The main reasons for feeding peanuts after 12 months were the belief that introduction was not important (32%), fear of a reaction (29%), and guidance from PCP (26%).

Together, this research reveals that parents may be comfortable with the idea of early introduction of peanut-containing foods, and some pediatricians are discussing the guidelines with their patients. Still, there is an urgent need to expand awareness and address barriers to implementation, like the fear of an allergic reaction or choking, which may make introducing peanuts more difficult. Participants felt that by having access to more information through sources like pediatricians and educational handouts, they could overcome the aforementioned obstacles. [22]

Factors Influencing Parent Feeding Practices in Infancy and Toddlerhood

The first two years of an infant's life are arguably the most pivotal for their growth and development. [59] A vital component of this is complementary feeding, which starts when other foods are added after exclusively feeding human milk or infant formula. [59] Complementary

foods, even allergenic ones, should be introduced into the diet around the sixth month to meet nutritional needs. [9,54,60] This transition from exclusive human milk or infant formula also depends on the child's developmental readiness [9,54,60]. Some signs of readiness for complementary feeding are when the infant shows an interest in mealtime, when hungry in between feedings when they can sit up while also having control over their head, and when tongue thrust, or extrusion flex is exhibited. [61] The timing in which complementary feeding occurs can influence feeding behaviors. [62]

In addition to authoritative medical and public health recommendations on feeding practices, a variety of factors influence foods provided to infants and children. The family, particularly parents and other caregivers, has been shown to play a significant role in shaping a child's eating behaviors, choices, and attitudes toward food. [63] These caregivers' strategies, or parental feeding practices, are methods parents utilize to control factors involved with feeding their child. [64] These methods determine how much, when, and what foods a child eats and can change over time depending on various factors. [64] Economic status, education, interpersonal relationships, fear, media, and a child's behaviors/physical characteristics can all potentially affect how parents feed their children. [64-67]

Socioeconomic status (SES) has been shown to play a significant role in feeding practices (Davis, Li et al. 2018) Complementary feeding guidance from the 2020 – 2025 DGA encourages giving a variety of quality nutritional foods that meet the child's needs [54], and repeated, frequent exposure to new foods has been shown to increase the acceptability of foods. [68] Families with lower SES may be less able to provide their infants with a variety of nutritious foods. [69] How frequently these foods are introduced can also be a limiting factor for families with a low SES. Infants are born with a natural taste for sweet-tasting foods and decline foods with sour and bitter

flavors, which are common in many vegetables. [70] Research has shown that repeated exposure to these foods supports acceptance and likeability [71], which can be challenging with limited financial resources. [72] Economically constrained parents may avoid providing their children with newer foods or even reintroducing food items that their children rejected to minimize food waste and reduce financial loss. [72]

Lower education levels are associated with lower incomes, and the education level of children's parents also plays a part in how they are fed. Infants of mothers who received little or no education were shown to consume fewer fruits and vegetable foods than those with higher educational levels. [73-76] This association was related to higher quality foods, like fruits and vegetables, being replaced for lower quality foods, like sugar-sweetened beverages and candy, due to the parent's inability to purchase foods for financial reasons, lack of variety in the foods that were available to them, and the lack of water for cooking. [76]

Interpersonal relations, such as friends and family, have been shown to influence parents' decisions on when to begin complementary feeding, with some parents valuing the advice of their friends and family more than healthcare providers. [67] Conflicting advice has been noted by parents from healthcare providers and family/friends, likely due to the changes and inconsistencies in the complementary feeding recommendations provided by the CDC and the AAP. [67] Introducing solid foods has also been associated with high anxiety and stress levels for parents due to perceived judgment from other parents/family members, the possibility of an allergic reaction, and fear of choking. [66] When parents started solid food feeding and how they made choices on providing foods of varying textures and nutritional quality depended on their comfort level and the overall goal of doing what they thought was best for the child in terms of providing sufficient nourishment. [66]

Parents may use a wide range of sources, like the internet, to seek information on complementary feeding practices, but sufficient evidence is lacking to support this. [66,77] Using social media to disseminate public health information, like on proper complementary feeding, could be an effective and preferred way to reach parents and caregivers. [78,79] Some parents believe media to be a method of obtaining up-to-date information on relevant issues related to feeding, such as choking. [66,80] In contrast, others describe the information provided by the internet as unreliable and seek more reliable sources, such as healthcare professionals. [66,80]

How, when, and what a child is fed can also depend on the behavior and physical characteristics that the child exhibits. [18,81] In the EAT study, infant refusal related to swallowing issues, dislike of the food, and infant illness were identified as barriers for parents when feeding their infant allergenic foods during the complementary feeding phase. [82] Parents have also been shown to adapt their feeding practices based on their child's weight. Children weighing less and having less appetite tend to receive more pressure to eat, while those with a larger appetite and who are very responsive to foods are restricted. [81]

Conclusions

Early introduction of food allergens to reduce food allergy risk has been supported with expanded guidance from the 2017 Addendum Guidelines release on peanut introduction to the release of the 2020 Dietary Guidelines for America recommendations to introduce all food allergens during complementary feeding. Despite this support and mass dissemination to healthcare providers, poor implementation has been noted due to common challenges like lack of time and a need for further education to provide parent/caregiver recommendations properly.

Knowledge of these guidelines and introduction rates for parents/caregivers have increased, particularly among certain subgroups of the population, including those with a family

history of a food allergy or children with eczema. Implementation is still suboptimal, with most estimates indicating that less than 20% of US parents/caregivers offer peanut-containing foods to their infants before 7 months, and up to half offer them in the first year of life. When peanuts were introduced, more than half of parents and caregivers reported doing so in ways not appropriate for their child's stage of development. To reduce the food allergy burden, early introduction rates in forms that are appropriate must increase. With some parents/caregivers reporting willingness to introduce common allergenic foods, a deeper look into the factors that interplay with decision-making on their feeding choices with children is needed.

Research on infant feeding practices indicates that other family members, socioeconomic status, and infant feeding responses affect when and how often foods are provided. Thus, future research on knowledge of the guidelines is needed as to how to introduce highly allergenic foods in developmentally appropriate ways. Moreover, it is important to address barriers that parents and caregivers face in the complementary feeding phase, particularly with regard to allergenic foods like peanuts.

CHAPTER 3

EXPLORATION OF PARENT & CAREGIVER KNOWLEDGE, ATTITUDES, AND BELIEFS ON THE INTRODUCTION OF PEANUT AND OTHER FOOD ALLERGENS WITH COMPLEMENTARY FEEDING[1]

[1] Whitson, Q.W., Berg, A.C. To be submitted to *Journal of Nutrition Education and Behavior*.

INTRODUCTION

Food allergy prevalence is at an all-time high, with some studies indicating rates as high as 11% among adults [83] and 8% among children. [29,84,85] Peanut allergy is among the top three most common food allergies afflicting children (peanut, egg, milk) and is currently the most common food allergen responsible for fatal food reactions in the United States, along with tree nuts. [38,85] Studies estimate that peanut allergies are responsible for 60 %to 83% of all fatal food allergy reactions among children [40,86] peanuts were responsible for 59.2% of children being treated in the emergency department for a reaction associated with a peanut allergy in a study conducted by Gupta and colleagues. [85] The socioeconomic impact of food allergy on children, parents, and caregivers is also significant, with an average cost of $931 per child and observed reductions in health-related quality of life and functioning among parents and caregivers of children with peanut allergies. [5,43-45,87]. Unfortunately, accidental exposure to peanuts in children ranges from 3% - to 50% annually, with most of those exposures occurring in the home and most being managed inappropriately. [88] While oral and sublingual immunotherapy can improve tolerance to some allergens, including peanuts, and other methods of treatment are being explored, there is currently no cure for food allergy, making primary prevention the most promising strategy for reducing the food allergy burden. [89]

In 2017, the National Institute of Allergy and Infectious Diseases (NIAID) provided guidance on introducing peanuts to infants early and often to prevent peanut allergies. [10] This guidance was based on research that indicated introduction between 4 and 6 months to infants at the highest risk for peanut allergy decreased the risk of developing a peanut allergy by 86% and that risk reduction was sustained for five years. [11] Additional evidence on primary prevention of peanut and other food

allergies through early introduction during complementary feeding followed [10,13,52,53], encouraging other professional organizations including the United States Department of Agriculture (USDA) [54] and American Academy of Pediatrics (AAP) [60] to release guidance on introducing peanuts and other common allergenic foods to infants during complementary feeding to reduce the risk of food allergies in the United States (US). The Dietary Guidelines for Americans 2020-2025 recommends introducing peanuts and other common food allergens to children around six months of age when complementary feeding begins. [54] The DGA 2020-2025 indicates that children at high risk of peanut allergy (those with severe eczema, egg allergy, or both) should be introduced to 2 teaspoons (tsp) of peanut-containing products at least three times per week beginning between 4 and 6 months of age to reduce their risk for developing a peanut allergy.

Research assessing pediatrician knowledge and implementation of the 2017 NIAID guidance and DGA 2020-2025 recommendations has revealed unfamiliarity with the recommendations and poor implementation. [15-17,55] In one study by Gupta et al. [16], only 8% of pediatricians reported reading any part of the recommendations, and only 29% revealed fully implementing the recommendations. [16] Primary reasons for not discussing the guidelines with parents included a lack of clinical time, a need for more aids to practice with, and supplementary office materials to facilitate the education of parents on the implementation of the guidelines. The few published studies evaluating parent and caregiver knowledge of the early peanut introduction recommendations estimate that less than half of parents and caregivers reported having a comprehensive understanding of the guidelines surrounding the early introduction of common allergenic foods, regardless of whether their child had a food allergy. [17-21,90,91]

Broad dissemination and implementation of this guidance to reduce this research-to-practice gap and ultimately reduce the food allergy burden will require strategies that address

practitioners and those responsible for feeding infants, including parents and caregivers, childcare providers, and other important messengers. There is an urgent need to understand current knowledge and awareness of these recommendations, potential barriers to implementation, and the most influential sources of information among these priority populations in order to design effective interventions. This study utilized focus groups to explore parent and caregiver knowledge, awareness, and beliefs about the early introduction of peanut and other common food allergens during complementary feeding and identify influential sources of feeding information to inform the future design of education and messaging. The primary research questions guiding the study were:

1. *What do parents and caregivers know regarding the current guidelines for introducing peanuts and other common food allergens during the complementary feeding stage for infants?*
2. *What plays an influential role in guiding the introduction of allergenic foods to infants?*
3. *What are the primary sources of information for parents on complementary feeding recommendations, including the introduction of allergens?*

METHODS

Study Design

The present study is part of a larger, mixed methods study to explore parent and caregiver knowledge, attitudes, and beliefs about the early introduction of common allergenic foods and where they receive information about this topic. A mixed methods approach is warranted, as this is a new field of research with little theory or understanding established, and to ensure interventions designed from these results are appropriate for the priority population. [92] This sequential exploratory mixed methods design began with the qualitative focus groups described in this manuscript and was followed by a quantitative, cross-sectional survey with a broader population. Focus groups allowed for the exploration of current knowledge, attitudes, beliefs, and practices of complementary feeding and the early introduction of food allergens to reduce food allergy risk with fewer participants representing key demographics, permitting the emergence of new ideas alongside responses to the initial research questions. [93] Results from the focus groups will be used to inform the design of the quantitative, cross-sectional survey questions and potential responses distributed to a larger sample of participants (recruitment goal N = 500).

The qualitative and quantitative data were analyzed separately and then will be compared to develop a thick description of the current state of the topic. This manuscript describes the qualitative portion of the study. All methods and procedures were approved by the University of Georgia Institutional Review Board on Human Subjects (ID: VERSION00002869), and all participants provided informed consent.

Community-engaged sample selection, recruitment, and enrollment. This study used a community-engaged, purposive sampling approach to identify parents and caregivers of young children (ages 3 months to 6 years) to participate in focus groups. [94,95] Early childcare and education (ECE) centers in South Georgia were chosen as the setting for engagement for several reasons. First, more than half of American children attend ECE, with center-based care being the most common form [96] Georgia's Department of Early Care and Learning [97] requires parents of enrolled children to provide their ECE center with a feeding plan for any child under the age of one to cover breastmilk, formula feedings, and complementary feedings, which should include the introduction of new and potentially allergenic foods. Thus, there is some expectation of knowledge and practice in communicating about complementary feeding among parents whose children attend ECE centers. We aimed to engage the community for whom the results would impact, in this case, those who would be the priority audience for education and training about the food allergy introduction guidelines: parents/caregivers and ECE providers. Cooperative Extension (Extension) was enlisted as a community partner to facilitate recruitment and full participation in research from participants who might otherwise refuse to participate but for whom the results will impact. Extension regularly provides education and training to families with children, as well as to Early Childhood Education (ECE) providers [98], and is viewed as a trusted community partner. Lastly, parents and caregivers of children in childcare may have different knowledge, attitudes, and beliefs about feeding their children than those who do not regularly use childcare. As a first step in investigating this research question, we limited our investigation to those who might have similar experiences, with the intent to expand our work to new audiences in future investigations, including the cross-sectional survey. Similarly, to limit our investigation to those who might have a similar experience of living in an environment

where peanut production occurred [94,99], we recruited centers from South Georgia, where all of the state peanut production occurs.

Inclusion criteria for focus group participants were as follows: (1) 18 years of age or older, (2) a parent/caregiver of at least one child aged 3 months to 6 years old, (3) be responsible for feeding a child at least 4 times per month, (4) must have at least one child enrolled in an ECE and/or Head Start center, and (5) parent/caregiver must reside either inside or bordering a county where the focus groups were held. There were no exclusion criteria.

Local Extension Family and Consumer Sciences Agents located in South Georgia contacted licensed childcare learning centers and family childcare learning homes as defined by DECAL (Learning 2023) to host focus groups. Extension faculty aimed to recruit a minimum each of one ECE center representing counties in Georgia with low (<49,999,999 lbs.), moderate (50,000,000 – 99,999,999 lbs.), or high (>100,000,000 lbs.) peanut production so that responses could be compared across communities. [100] Centers were either previously known to the Extension faculty through usual education and outreach activities, or the Extension agent reached out to the facility in their area or a neighboring county to encourage participation and discuss the potential for future Extension programming. Once ECE centers were identified to host focus groups, parents and caregivers were recruited to participate by staff at the selected centers through emails to enrolled family listservs, posted and distributed print recruitment flyers, and social media. Recruitment materials indicated that food would be provided at the focus group, and participants could receive $15 for their participation. Participant recruitment for focus groups began in November 2023 and ended in January 2024.

On the day of the focus group, interested parents and caregivers presented to the center or other designated location and were provided a letter of consent to read over, informed verbally of

the overarching goal of the project, introduced to the participating research team members and their roles, and were provided the opportunity to ask any questions and exit the focus group before starting. Participants acknowledged that they consented to participate in the research study by staying and participating.

Data collection and measures. The focus group interview guide was designed by the research team to explore parent and caregiver beliefs on the early introduction of common allergenic foods during the complementary feeding phase for infants, parental awareness of the early introduction recommendations, and explore sources of information and influence in feeding practices. The questions and probes used were drafted by members of the research team (AB, QW), and refined in an iterative process until a final guide was created that reflected the aims of the study and could be completed in approximately 60 minutes. The focus interview group guide can be found in Appendix E.

Before the commencement of the focus group, each participant completed a brief survey to self-report basic demographic information (age, race, gender identity), family or friend food allergy history, parent status, and provide the age of the child/or children they care for. The survey used to collect the aforementioned information is located in Appendix D.

Each focus group lasted approximately 45 – 60 minutes and was conducted in person at the childcare facility or in a proxy location decided by the contact at the childcare facility. The lead student researcher (QW) was present during each focus group to facilitate each session alone or in partnership with the principal investigator (AB) and clarify any questions participants may have had with at least one other team member (MA, CG, AG) in attendance as a notetaker. Participants were encouraged by the moderator to share their own experiences as they relate to feeding their child and were told that everyone's viewpoints and experiences were valid and

important. All focus groups were audio-recorded, and a third party transcribed the focus groups verbatim (rev.com).

Qualitative data analysis. This study used a basic thematic content analysis using a constant comparative approach according to initial research questions.[95,101-103] After receiving the initial transcription, the primary graduate student researcher (QW) reviewed, cleaned, and compared what was transcribed to the audio recordings to ensure accuracy and provide initial familiarity with the data. The primary student researcher (QW) created a preliminary codebook according to the research questions to be used in the first round of coding, shared it with the second student researcher (MA), and reviewed it to confirm mutual understanding of the codes and definitions by the entire research team (QW, MA, and AB). The research team used the qualitative analysis software ATLAS.ti version 23, as a tool to perform qualitative coding and analysis.

The two student researchers independently coded the first focus group transcript, primarily deductively using the established codebook but using inductive methods to create new codes when the data did not fit pre-established codes.[95,102] After coding the first focus group, the entire researcher team met to review and discuss the entire transcript, quotes, and associated codes. Researchers reconciled differences until each quote had an agreed-upon beginning and end and associated code or codes. The researchers updated the codebook after each round of coding with their clarified definition of existing codes and added any new codes developed. Student researchers repeated this process for the second and third focus group transcripts.

Once coding was complete, the principal investigator (AB) reviewed all transcripts and associated codes for consistency in application and made final clarifying revisions to the codebook. The research team (AB, QW, and MA) discussed and resolved any discrepancies.

The primary student researcher then explored individual codes to identify code groups and, ultimately, themes according to the research questions. The themes identified were discussed and agreed upon by members of the research team (AB, QW, MA) in a series of steps informed by the Sort and Shift, Think and Shift approach.[104] The primary researcher identified code groups and themes, engaged with the data through diagramming and reflection, and presented it to the team. The team discussed the findings and provided initial feedback for consideration. The primary researcher repeated the process three times until a consensus was reached.[104]

Research Team and Reflexivity Statement

The research team consisted of the principal investigator, who is a doctoral-level registered dietitian (AB), a primary student researcher (QW), a secondary student researcher (MA), and two Extension Professionals (CG & AG), all of whom were trained and experienced in basic research methods and those involved in data analysis (AB, QW, and MA) were trained in qualitative research methods. The principal investigator identified as a white female parent with no personal food allergies and one child with a food allergy. The primary student researcher identified as a black male without children who was formally diagnosed with a peanut allergy in childhood, which later resolved. The secondary student researcher and two supporting Extension professionals identified as white females without children. Two of these researchers had a food allergy. Researchers emphasized the importance of each participant sharing their experiences and points of view, that there were no wrong answers, and that feelings and responses were acceptable for participants to differ. Researchers aimed to promote a positive and open environment.

Reflexivity contributes to trustworthy qualitative research results. [95,105] The authors acknowledge their positions as caregivers, researchers, people living with and without food allergies, and community members and discuss these biases and their potential impact on data analysis and interpretation throughout the research process to acknowledge and mitigate its impact.

Moreover, the analysis process was conducted in a group of all three researchers with different backgrounds to triangulate interpretation and limit the influence of personal biases on data analysis. An extended researcher reflexivity statement can be found in Appendix A.

RESULTS

Participants

Thirteen individuals participated in three focus groups, with all participants meeting the eligibility criteria (Table 3.1). Two focus groups were located in counties with low peanut production (FG1 and FG2), while the final focus group was located in a county with high peanut production (FG3). The final participants included: 4 individuals (FG1), 4 individuals (FG2), and 5 individuals (FG3). Table 3.1, located at the end of this chapter, summarizes the sample from each focus group. Participants were 100% female, primarily non-Hispanic Black/African American young adults born in the US (Table 3.1). A majority had a high school education, with only one participant reporting receiving a postsecondary education and graduating. Additionally, 76.9% of participants identified themselves as the parents of the children enrolled in early childcare, with most children being 24 months of age or older.

Coded transcripts included 200 quotes and identified 49 codes/topics. First, data were organized by research questions, each revealing a variety of related topics. After reviewing all

research questions, identified topics, and overall gestalt, four primary themes and two subthemes were identified that described overall parent knowledge, awareness, and practices related to complementary feeding and early introduction of food allergies and sources of information and influence for feeding infants and young children. First, parents and caregivers had limited knowledge and awareness about the early introduction of common food allergens to help prevent those allergies. Secondly, parents and caregivers cited fear of choking as a deterrent for introducing all foods, including those that are common allergens. Regarding common allergenic foods, introducing peanut and peanut-containing foods was considered the riskiest among all common food allergens, leading to later introduction. Thirdly, the most influential sources of information on what to feed their children were family, specifically their mother/grandmother, except when there was a history of food allergy in the family. Lastly, the act of picky eating was a recurrent and significant topic when talking about complications and individual peculiarities of the children they cared for when feeding. Many parents and caregivers expressed frustration and curiosity when discussing the difficulties and oddities they experienced when feeding their children all foods, regardless of the risk of an allergic reaction. Table 3.2 depicts the research questions, associated focus group guide questions, topics that emerged within and across questions, and representative quotes. Table 3.3 provides a description of the emergent themes from the thematic analysis. The following sections describe the themes and subthemes that arose according to the research questions.

Limited Knowledge and Awareness

Parents and caregivers had limited knowledge and awareness about the early introduction of common food allergens to help prevent those allergies. Knowledge-related topics included knowledge or lack of knowledge regarding what foods can cause an allergic reaction and which

foods cause the majority of allergic reactions, or "the Big Nine." When parents and caregivers were asked about specifics related to how they fed and when they fed allergenic foods to their children, responses varied but overall revealed that they were unaware as to which foods were considered allergenic, the true definition of a food allergy, or any distinction between feeding guidelines specific to food allergies versus healthy food feeding guidelines. For instance, when asked if parents were told when to feed allergenic foods to their children, one parent said, "*Like, the organic ones, pretty much. They were, um, real, like, leaning towards that."* Several parents and caregivers commented on healthy or unhealthy foods when probed about their knowledge of allergen introduction. For example, one said, *"I seen y'all had on the paper [consent form], it said wheat. People are like, "I thought wheat supposed to be healthy. You can also be allergic to wheat, too?"* As evidenced by this quote, there was substantial confusion as to what constituted an allergenic food and whether that was related to the food being healthy or not. In general, there was a lack of understanding of the Big 9 foods likely to cause an allergic reaction, any guidelines on feeding allergenic foods, and the definition, causes, and consequences of a food allergy.

Fear of Choking

Parents and caregivers cited fear of choking as a primary deterrent for introducing solid foods, including those that are common allergens. Most parents and caregivers expressed this as their main concern when beginning complementary foods with their infant, stating, *"Well, I had a fear. You know, he'd choke.*" Moreover, there was confusion about whether introducing food allergens was a choking hazard or not. For example, one parent conveyed confusion over foods and their risk for choking versus foods that are more likely to cause a food allergy: *"Now, I ain't heard about egg. But I heard grapes, grape kinda they dangerous to give 'em."*. Repeatedly throughout the entire discussion, participants returned to the topic of choking.

Delayed introduction of peanuts due to choking risk. While parents and caregivers were concerned about choking on all solid foods, they expressed specific concern about peanut foods as a choking hazard and cited this as a reason for delayed introduction: *"Now me, peanuts is dangerous to be giving to children, you know? It could easily go down the wrong pipe, you know. I'm, now I'm kinda scared about givin' them a peanut.*" This subtheme emerged as parents and caregivers discussed both whole peanuts and peanut butter as a concern but didn't mention concerns related to other food allergen introduction. Specifically, they noted that they would not give their children peanut butter, as one stated: *"It would have been so thick, I-I don't think they throat can handle that. 'Cause you know it's already kinda thick for us to swallow."* Other specified methods parents and caregivers cited they used to introduce peanuts to their child were as follows: peanut candies, peanut butter cookies, peanut butter crackers, boiled peanuts, and peanut butter and jelly sandwiches. Interestingly, as the conversation deepened on this topic, some participants felt that as their child grew older in age and began developing teeth, it made them feel more comfortable introducing peanuts. For example, one participant said they would give their child peanut butter at one year of age: *"Because they done grown older they done started growin' teeth…"* while another participant stated*: "Me, I don't think a one-year-old should eat peanuts. I think when they get a full mouth of teeth they can chew 'em up better. I, I don't know. [inaudible 00:16:39]. Some of 'em do now but me that's, that's my opinion.".*

Reliance on Family

Parents and caregivers relied primarily on their families for guidance on what foods to feed their children and when those foods were appropriate to be fed, with the most influential familial sources being mothers and grandmothers. Participants mentioned many sources where they receive information to determine what they feed and how they feed their children, such as the

internet, social media, pediatricians, childcare teachers, their own discernment, and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Despite the broad range of sources and the participants' willingness to consider their perspectives, parents and caregivers perceived the information obtained from their family as more reliable, especially from an older maternal figure, referencing the volume of experience they have had over time when caring for children and familiarity with their children, specifically. For example, when one participant was asked to elaborate on why they would utilize the information given by their grandmother over their child's healthcare provider, they stated: *"Yeah. I just- I'd rather just go with the, like I said, older people just- I- like my great-grandma and my grandma because they done raised basically so many kids."* and provided further context by saying*: "Like I said they don't- they raised like generations so, like, they know what to do with kids. They know when kids sick, uh, they have an allergy to something or how they react to something they know they don't like and stuff like that, like, that's just why I go off of what they say 'cause, you know. And Pediatricians they don't be around your kids all of the time. So, like, the grandparents you going to see of them, like, every- throughout the week all the time."* Other instances where participants believed that the information obtained from familial caregivers superseded other sources appeared in many different contexts, with one participant saying: *"My grandparents- My grandparents – I'd rather listen to these older folks. You know what I'm saying?"*. With another parent/caregiver saying in an entirely different conversation: *"I believe my, the grandparents over doctors sometime."*

Family history of food allergy. When discussion surrounding concerns about introducing common allergenic foods occurred, parents and caregivers expressed concern about introducing food(s) that their family members were assumed to be allergic to: *"That was the main thing.*

Peanuts. Peanuts and milk allergies. See, my family, we have a milk allergy so I already had knew about the milk allergy but peanuts – nobody's really allergic to peanuts but I did, like, caution that 'cause anybody could be allergic to that.". This subtheme emerged when parents and caregivers discussed specifics on what factors they were most mindful of when introducing these foods. Those parents and caregivers who had a family history of a food allergy were more mindful when introducing those foods to their children. One participant, after probing for more responses related to introducing allergenic foods, stated that their dad had a food allergy to shellfish, and this made them more nervous about introducing shellfish to their children: *"I had a thing about fish. You know, shrimp. Seafood?"* and in a subsequent sentence saying: *"And I'm thinking about that because my Pops, he's-he's allergic to shellfish."* And ending that conversation with: *"So that was my biggest thing."*.

Picky Eating

A theme that emerged throughout all three focus groups but wasn't part of the initial research questions was picky eating. When probed about starting to feed with infants or discussing feeding practices at home with other children, participants frequently referenced picky eating. Many parents and caregivers expressed frustration and curiosity when discussing the difficulties and oddities they experienced when feeding their children all foods, regardless of the risk of an allergic reaction. One participant stated: *"Believe it or not, she don't really like anything, like- ... I mean, other than burgers, but she don't like spaghetti that has, like, I don't know. It's, like, really weird. And even when I was craving, like, onions with garlic, like, over meatloaf or anything like hamburger meat. Right? But, for some reason, she likes hamburgers. But any other thing that has that in it? She doesn't care for it, like spaghettis and meatballs and meatloaf. (laughs)*" Participants identified several behaviors exhibited by children identified as

"picky eaters" including rejecting the food provided, usually by spitting it out, the first time and during all subsequent exposures, explaining that the child will not eat the food in question anytime it is provided to them. One participant stated that her child just simply does not eat certain foods: *"The only thing I can say is, my last child, she don't eat peanuts at all. She don't like walnuts, peanuts, nothing. She, she eat the candy and then she spit the peanut- ... I know when she spit them out, 'cause they be everywhere on the floor. (laughs)"* Furthermore, a participant with multiple children described her second child exhibiting feeding tendencies that didn't occur with her first child, causing her confusion: *"The only child I have a problem with is my second child. She just don't like eating. Like, I really have a hard with giving her any kind of foods. Um, but I mean they do eat stuff like pizza and stuff like that, but she really have a hard time just, ah, anything."*

DISCUSSION

Analysis of focus groups with parents and caregivers of children enrolled in childcare in South Georgia revealed little knowledge and awareness about when and how to introduce food allergens to infants to reduce the risk of food allergies. Moreover, sentiments shared about concerns over introducing peanuts as a choking risk indicated they were unaware of the recommendations on how to introduce peanut-containing foods in developmentally appropriate ways. Information from familial sources, primarily maternal figures (e.g., mothers, grandmothers), was viewed as the most influential for participants as it pertains to guiding feeding practices for their children. When introducing common allergenic foods, a family history of a food allergy caused parents and caregivers to be more vigilant when introducing the family's

offending food allergen to their child. Lastly, picky eating was an important emergent topic among parents and caregivers, affecting what participants fed their children.

The findings from this study are consistent with previous reports of limited knowledge and awareness among parents and caregivers living in the US. [20] Conversely, other literature reported that almost half of a national representative sample was aware of the recommendations made for peanuts. [21] Notable differences between our sample and those obtained from the previous studies were age, race, and rurality. Greenhawt and colleagues only recruited parents and caregivers aged 18 – 55 years old, potentially missing the opportunity to obtain older caregivers in their sample. This could explain why some of their participants were more familiar with the guidelines. Furthermore, a majority of the participants in their sample identified as White, whereas most of the participants in our sample identified as Black/African American. People of color, particularly African Americans, have been shown to have a higher prevalence rate and burden of food allergy than their white counterparts [28,29,106], which makes our sample higher risk. Lastly, our sample was from rural areas, compared to the urban samples in other studies. Individuals living in rural areas have been shown to have less access to healthcare and health information, potentially explaining some differences in knowledge and awareness.

When asked to recount initial feelings and memories of complementary feeding with the children they care for, parents and caregivers had many sentiments, ranging from feelings of happiness to fear. Focus group analysis showed that fear was a consistent feeling throughout, which was rooted in the thought that their child would choke on any food provided to them, regardless of the risk of allergic reaction. When discussion surfaced around introducing common food allergens in particular, peanut emerged as the dominating allergen of concern with mention of any of the other common food allergens. The perceived threat of choking is noted in the

literature as an influential factor in parental feeding practices when complementary feeding begins. As discussions shifted towards specifically introducing common allergenic foods, peanut was the primary focus. It was viewed as the riskiest to introduce to a child, with comfort varying based on a child's developmental factors and the form in which it could be introduced, causing parents and caregivers to feel that a later introduction of this food would be more appropriate for the safety of the child. When discussion of facilitators to introducing peanut and peanut-containing foods occurred, participants shared a consensus that introduction was safe for children who were over one year of age and children who had significant tooth formation. This age-related finding is consistent with one study that reported an increased willingness to introduce peanut-containing foods later in life, beginning at 11 months of age. [21] Contrary to our findings, another study found that a great majority of parents (90%) were comfortable with introducing the recommended time frame during the 4 – 6 month time frame. [22] Reasons for the discrepancy between our findings and those of Lai et al. [22] may be due to differences in access to health information and health care. The source that parents frequently used for education about the introduction of peanut-containing foods was their pediatrician vs ours, where parents and caregivers cited older maternal figures like their mothers and grandmothers who may not be up to date on the changing guidance. Thus, future research should explore these questions among samples of individuals representing diverse sociodemographic characteristics.

When asked to provide sources that they utilized to get information on how and what they feed their children, parents and caregivers gave a variety of responses, such as WIC, the internet, social media, pediatricians, etc., with the prevailing source being family. Further analysis of the focus groups revealed that maternal family guidance, particularly from the mother or grandmother, was the most influential. Participants believed that their mothers' and

grandmothers' previous experiences with caring for children and the knowledge gained through those experiences made them and the information obtained from them reliable and trustworthy. Non-professional feeding sources, such as mothers and grandmothers, have been reported as sources utilized for child-feeding advice. [107,108] Parents and grandparents have been noted in the literature to have a significant effect on the development of healthy eating habits among children due to the formal and informal ways they participate in childcare throughout their lives via learning, assistance with meal preparation, and varying cultural norms. [109-111] Thus, future educational interventions to increase guideline implementation should involve family members, including maternal mothers and grandmothers, as priority audiences.

In addition to this theme, a sub-theme was identified, which drew more attention to the family as an influential factor. Parents and caregivers who identified a family member as having a history of a food allergy reported being more cautious when introducing that particular food allergen. This finding is not surprising but should be considered when developing educational strategies. It was surprising, however, that picky eating surfaced as a primary driver of feeding practices and experiences with all foods. Participants felt as if picky eating was an extreme deterrent to feeding their children certain foods. It was noted that instances of picky eating occurred for foods regardless of risk for a food allergy-related reaction and that it varied from child to child. Picky eating has been referenced by parents and caregivers as a common barrier to introducing common allergenic foods throughout the first three years of life, causing a sense of defeat among caregivers. [82] The complexity of picky eating has been linked to both intrinsic factors (personality, temperament, sensory sensitivity) and how they present in children, along with extrinsic factors (parental eating habits, parental feeding practices, parental mental health)

and their impact on children. [112] It will be essential to consider "picky eating" as a barrier to introduction in the design of interventions.

Implications for Research, Policy, and Practice

Findings from this qualitative study elucidate the importance of having trustworthy and reliable resources that aim not only to support but also to help empower parents and caregivers to make choices that are in line with the health and individual needs of their children and adhere to evidence-based feeding guidelines. In this study, parents and caregivers showed limited knowledge of what foods commonly cause allergic reactions and had difficulty deciphering the difference between healthy eating recommendations and general guidance on feeding allergenic foods. Educational programming and supplementary materials should be developed for parents and caregivers to help clarify any confusion and provide further insight into the importance of early introduction. This study revealed that grandmothers are an influential source of feeding information valued over clinical providers and health education professionals. Thus, educational interventions should include these individuals or identify strategies to engage these individuals in conversation about the guidelines. Lastly, educational interventions should include information on picky eating to help parents and caregivers distinguish between normal infant responses to new foods, picky eating, and true food allergy or intolerance.

Future research efforts should aim to recruit a larger sample size through quantitative methods to ensure a more diverse representation of demographics and geographic locations for broader population applicability. Additional qualitative research might address the same questions among different priority populations, including families where children do not attend care, other racial and ethnic minorities, and education levels. In addition, there is a need to

explore further exactly when and how parents and caregivers are providing the Big 9 food allergens to their children and learn more about specific barriers and facilitators to the early introduction of individual foods.

Findings from this study also have merit in being utilized in policy in three unique areas. On the federal level, the WIC program serves and improves the health of its participants. Currently, WIC only provides one 18oz jar of peanut butter in packages IV-VII to support women and older children, resulting in a missed opportunity to support low-income families when introducing one of the nine common food allergens. To better support families and encourage the introduction of peanut-containing products early and often for prevention, it would be optimal also to provide peanut butter and peanut powder in packages II – III for all types of infant feeding (fully formula-fed, partially breastfed, and fully breastfed) at the age of 6 months. This would require discussion with the families enrolled in WIC on early food allergen introduction and developmentally appropriate ways to introduce peanut-containing foods. Next, all infants and young children enrolled for care and participating in a Child and Adult Care Food Program (CACFP) center or day care home must be offered a meal that complies with meal pattern standards set by the USDA. All nine major food allergens and foods that contain them are allowed to be a part of a reimbursable meal as long as it is in the form appropriate for the child. After allergenic foods have been introduced and it has been determined that there is a limited risk of an allergic reaction, the introduction of these foods can continue at the center according to the individual feeding plans, which could support adherence to the guidelines through sustained exposure over time. This multi-level approach of encouraging and providing opportunities for children to be exposed to common allergenic foods could be pivotal to reducing the prevalence of food allergies state and nationwide.

Health Equity Implications

The findings from this study contribute to addressing the prevalence and burden of food allergies, particularly on the Black/African American population, a population designated by the National Institutes of Health to have health disparities and thus, a priority population[113]. There are significantly higher rates of this disease and a considerably higher burden on this racial/ethnic minority group compared with others[28]. Different societal conditions that impact health, also known as Social Determinants of Health (SDOH), likely play a role in this disparity, such as social inclusion/exclusion, education, income, geographic location, and specific cultural aspects. Our findings illuminate some of the interplay of certain environmental context variables and cultural norms that may contribute to the inequalities amongst this group in nutrition and health education in general, and specifically, related to food allergy, resulting in higher disease burden. Research with those that are most impacted by a disease, but may be not well represented in research is key to ultimately reducing food allergy prevalence and improving health for all people[114].

For example, due to racial income disparities, Black and Latino individuals are more likely to be eligible for WIC than other populations. [115] In 2021, approximately 3,673,810, or 72.2% of the total US population of Black-only non-Hispanic people, were eligible to receive WIC benefits. This is the highest eligibility rate amongst all racial groups reviewed. Thus, it might be assumed that improving education through WIC is the key to improving food allergy introduction behavior among Black caregivers and reducing food allergy among Black people. However, our research with primarily Black families (82%) indicated that while WIC was a source of information about feeding practices for caregivers, it wasn't the most important source of information. In our study, female maternal figures were the most influential source of

information. Given the high proportion of black families who are on WIC, it will be essential for WIC to support early introduction of food allergens through timely education and policy (WIC Packages) to address these inequities. However, recognizing that many families choose not to enroll, and that in black families, the maternal grandmother figure strongly influences feeding practices, interventions that improve awareness and knowledge among these maternal figures is key to addressing this disparity, and ultimately health equity. Future research should explore this topic with other racial/ethnic minority groups with high food allergy burden, but also with Black families in other parts of the country who represent various educational statuses, regions, and cultural backgrounds.

Study Strengths and Limitations

This study design has several strengths to highlight. First, it utilized focus groups to provide the qualitative insight desired from participants representing priority populations (Black/African American, lower educational attainment). By leveraging this qualitative research method to obtain information, we were able to lead into deeper insights as participants explored various ideas and topics related and unrelated to our initial research questions independently and with each other. Secondly, we utilized existing Cooperative Extension partnerships to recruit childcare centers and participants who already have a foundation of trust with research, likely improving the data's recruitment, retention, and trustworthiness. Thirdly, a constant comparative approach was employed throughout the entire thematic analysis process to ensure congruency across codes/topics and, eventually, the subthemes and themes produced. In addition, the iterative process of engaging with the data over time provided opportunities to explore reflexivity and trustworthiness.

While this study has several strengths, it also has its limitations. The possibility that participants may have experienced social-desirability bias or the tendency to answer questions in a way that is favorable to other participants is plausible. To minimize this bias, participants were encouraged at the beginning of the focus group and throughout the time that their own personal experiences were meaningful and valued and probed to share more. Another limitation was the location in which the focus groups were conducted. Two of the focus groups were completed at the ECE center, while one was completed at a local community meeting space, with each having its own disadvantages, including difficulties with the quality of the audio recordings for FG3. A centralized location for participants with ideal environmental conditions would have been ideal to reduce these complications and limit the impact of the environment on the experience. Finally, this study's usage of purposive sampling to include parents and caregivers who have children enrolled in childcare and live in South Georgia limits the generalizability of the results to the population obtained in the sample. However, this sampling method was warranted due to the desire to create educational methods that target this specific group and the intent to explore these topics with a larger, more diverse sample using quantitative methodology at a later stage of the research. Although some of the findings from this work may not apply entirely to other populations, they do provide initial insights and lay the groundwork for future studies on early food allergen introduction.

Conclusion

This study provided in-depth insight into what South Georgian parents and caregivers know, feel, and believe about introducing common allergenic foods to their children during the complementary process. These guardians shared concerns about choking and picky eating when discussing experiences about feeding the child or children that they care for. Furthermore, there

was a general lack of knowledge of the relatively new recommendations of introducing common food allergens early and often to prevent food allergy, with familial maternal figures being a valued and trusted source of information for parental feeding practices. These findings signal an opportunity to create multi-level educational interventions and supplementary materials to help mitigate some of these parents' and caregivers' concerns and encourage implementation of the new guidance. Specifically, this study lifts up the voices of individuals most afflicted by food allergies and brings to light how to best approach and provide them with this necessary information.

Forming partnerships with ECE providers, WIC providers, and others who regularly interface with parents and caregivers and providing these partners with the resources necessary to assist and empower parents and caregivers to provide their children with food in safe ways and reduce their risk of developing a food allergy is also a key call to action. More work is needed in this area to surmise any further barriers and facilitators related to introducing common allergenic foods early, often to infants and young children, to combat the rising prevalence of food allergies in the United States.

List of Abbreviations

AAP: American Academy of Pediatrics

CACFP: Child and Adult Care Food Program

CDC: Center for Disease Control and Prevention

ECE: Early Childcare and Education

FDA: Food and Drug Administration

Nutrient Data System for Research: NDSR

NHANES: National Health and Nutrition Examination Survey

NIAID: National Institute of Allergy and Infectious Disease

SES: Socioeconomic Status

SNP: School Nutrition Program

USDA: United States Department of Agriculture

WIC: Special Supplemental Nutrition Program for Women, Infants, and Children

Declarations

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Availability of Data and Materials: Data and materials are available from the authors upon request.

Conflict of Interest: The authors have no conflicts of interest to declare.

Table 3.1 Focus Group Participant Characteristics (N = 13)

Demographic Variables	**Mean ± SD, Median ± SE,** or **n (%)**
Gender	
Female	13 (100%)
Male	0 (0%)
Race	
Black or African American	11 (81.8%)
White	2 (18.2%)
Ethnicity	
Hispanic or Latino	0 (0%)
Non-Hispanic or Latino	12 (92.3%)
Prefer Not to Say	1 (7.7%)
Birth Country	
USA	12 (92.3%)
Outside USA	1 (7.7%)
Age (years)	36.3 ± 16.1, 28.0 ± 7.8
20 – 29	8 (72.7%)
30 – 39	1 (6.8%)
40 – 49	2 (13.7%)
50 – 59	0 (0%)
60 and over	2 (13.6%)
Education Level	
Some high school but did not graduate	1 (6.8%)
High school diploma or GED	8 (72.7%)
Some College or technical school but did not graduate	2 (13.7%)
Technical School or Associate's degree (2-year college)	1 (6.8%)
College graduate (Bachelor's degree)	0 (0%)
Graduate degree (Master's, Doctoral, Specialist, etc.)	0 (0%)
Not Reported	1 (7.7%)
Parent Status	
Parent	10 (76.9%)
Grandparent	2 (15.4%)
Other Caregiver	1 (7.7%)
Number of Children	2.2 ± 1.1, 2.5 ± 0.32
Age of Children in Household[1]	
< 4	0 (0%)
4 – 6	1 (3.9%)
7 – 11	1 (3.9%)
12	1 (3.9%)
> 24	20 (76.9%)
Not Reported	3 (11.6%)
Participant Reported a History of Food Allergy and specific food allergen[2]	
Yes, milk	1 (7.7%)
No	12 (92.3%)
Reported family member or friend with food allergy[3]	
Yes	5 (38.5%)
No	8 (61.5%)
Family or friend's identified food allergy[4]	
Peanut	0 (0%)
Tree Nut	1 (12.5%)
Egg	1 (12.5%)
Shellfish	1 (12.5%)
Soy	1 (12.5%)

Wheat	0 (0%)
Sesame	0 (0%)
Milk	3 (37.5%)[5]
Other	1 (12.5%)

1. Participants were asked to record the ages of all children in the household. The total response count exceeds the number of focus group participants.
2. Participants were asked, "Do you have a food allergy?" (yes/no). Participants who responded "yes," were asked, "what food(s) are you allergic to? Check all that apply." nine major food allergens were options to select, and space for "other food, please explain" and open response.
3. Participants were asked, "Does anyone in your family or a very close friend have a food allergy,"
4. Participants who responded "yes," were asked,, "what food(s) are they allergic to? Check all that apply." nine major food allergens were options to select, and space for "other food, please explain" and open response.
5. One individual answered "no" to a family/friend with a food allergy but selected milk as an allergen.

Table 3.2 Identified Topics According to Research and Focus Group Questions

Research Questions	Focus Group Guide Questions[1]	Topics Identified	Quotes
What do parents and caregivers know about the food allergy introduction guidelines?	• Tell me about how and when you should give peanuts or peanut products to your baby for the first time. • Can you tell me what you know about feeding other foods that are likely to cause food allergies, like eggs, fish, or shellfish to babies?	Knowledge About Big 9 Allergenic Food Forms	**Speaker 5:** *"I seen y'all had wheat on the paper (consent form), it said wheat. People are like, I thought wheat supposed to be healthy. You can be allergic to wheat, too?"*
Who plays an influential role in guiding the introduction of allergenic foods to infants?	• How did you know what to feed your baby or the children you care for first? • Where and/or how do you like to get information on how and what to feed your baby?	Family (Dad, Mom, and Grandparents) Internet Pediatrician Self-Sourced Social Media Teachers WIC	**Moderator:** *"Um, so how did y'all know, you, what to feed your baby? Who showed you how to care for them first? How did you know?"* **Speaker 8:** *"My grandma."* **Speaker 6:** *(laughs)* **Speaker 3:** *"That's what I was gone say…same thing." (laughs)* **Speaker 4:** *"Yeah. Yeah, that's the number one answer.*
What plays an influential role in guiding the introduction of allergenic foods to infants?	• How did you know what to feed your baby or the children you care for first? • Where and/or how do you like to get information on how and what to feed your baby?	Perceived Choking Risk of Foods Age of Their Child Family History of Food Allergy	**Speaker 1:** *"Now me, peanuts is dangerous to be giving to children, you know? It could easily go down the wrong pipe, you know. I'm, now I'm kinda scared about givin' them a peanut."* **Speaker 5:** *"That was the main thing. Peanuts. Peanuts and milk allergies. See, my family, we have a milk allergy so I already had knew about the milk allergy but peanuts- nobody's really allergic to peanuts but I did, like, caution that 'cause anybody could be allergic to that."*
Not applicable[2]		Picky Eating	**Speaker 6:** *"The only child I have a problem with is my second child. She just don't like eating. Like, I really have a hard with giving her any kind of foods. Um, but I mean they do eat stuff like pizza and stuff like that, but she really have a hard time just, ah, anything."*

1. Full focus group guide with introduction and prompts included in Appendix E
2. Topics that arose not specific to an initial research question and emerged throughout the discuss

Table 3.3 Description of Emerging Themes

Theme	Subthemes	Description	Supporting Quotations
Limited Knowledge & Awareness	n/a	When parents and caregivers were asked about feeding allergenic foods to their children, their responses varied and revealed that many were unaware of which foods were allergenic and had limited knowledge about food allergies and feeding guidelines.	*"I seen y'all had on the paper [consent form], it said wheat. People are like, "I thought wheat supposed to be healthy. You can also be allergic to wheat, too?"*
Fear of Choking	Delayed Introduction of Peanuts Due to Choking Risk	Parents and caregivers cited fear of choking as a primary deterrent for introducing solid foods, including those that are common allergens. Specific concerns about peanut foods were expressed, causing delayed introduction.	*"Now me, peanuts is dangerous to be giving to children, you know? It could easily go down the wrong pipe, you know. I'm, now I'm kinda scared about givin' them a peanut.*"
Reliance on Family	Family History of Food Allergy	Parents and caregivers traditionally relied on family members, especially mothers and grandmothers, for advice on feeding children and deciding when to introduce new foods. They were concerned about potential allergies within the family.	*"Yeah. I just- I'd rather just go with the, like I said, older people just- I- like my great-grandma and my grandma because they done raised basically so many kids."* *"That was the main thing. Peanuts. Peanuts and milk allergies. See, my family, we have a milk allergy so I already had knew about the milk allergy but peanuts – nobody's really allergic to peanuts but I did, like, caution that 'cause anybody could be allergic to that.".*

Picky Eating	n/a	Many parents and caregivers expressed frustration and curiosity when discussing the difficulties and oddities they experienced when feeding their children all foods, regardless of the risk of an allergic reaction.	*"Believe it or not, she don't really like anything, like- ... I mean, other than burgers, but she don't like spaghetti that has, like, I don't know. It's, like, really weird. And even when I was craving, like, onions with garlic, like, over meatloaf or anything like hamburger meat. Right? But, for some reason, she likes hamburgers. But any other thing that has that in it? She doesn't care for it, like spaghettis and meatballs and meatloaf. (laughs)*"

CHAPTER 4

CONCLUSION

The present study utilized focus groups with parents and caregivers of children enrolled in early childhood education (ECE) in South Georgia to explore knowledge of guidelines regarding the early introduction of common allergenic foods during complementary feeding to reduce food allergy risk. In addition, the study aimed to identify factors that promote as well as complicate the introduction of these foods and which sources of information may be most influential for behavior. A review of the current literature revealed parents and caregivers were unfamiliar with the 2017 Addendum Guidelines for the Prevention of Peanut Allergy from the National Institute of Allergy and Infectious Diseases (NIAID), but no studies had investigated awareness following the release of the 2020 – 2025 Dietary Guidelines for Americans which provided guidance on introducing peanuts and other allergenic foods to reduce food allergy risk. Moreover, few parents were introducing allergenic foods during the complementary feeding phase (Anater, Catellier et al. 2018, Greenhawt, Chan et al. 2018, Lai and Sicherer 2019, Groetch, Czerkies et al. 2021, Venter, Warren et al. 2022, Samady, Warren et al. 2023)Research suggested parents and caregivers reported variable comfort with introducing allergenic foods during the complementary feeding phase, fear and confusion around the possibility of an allergic reaction and the practicality of introducing an allergen like peanut due to choking risk (Lai and Sicherer 2019, Venter, Warren et al. 2022, Samady, Warren et al. 2023). However, most of this data was derived from quantitative studies following the release of the 2017 Addendum Guidelines, and little is known about what parents and caregivers feel, believe, and know about

the early introduction of common food allergens to reduce the risk of developing a food allergy now that the primary source of nutrition guidance for the US, the 2020 DGA, provides food allergen introduction recommendations.

Data were collected during three focus groups with 13 total participants in counties with varying peanut production. Following transcription, coding, and basic thematic analysis of the data, four themes and two subthemes emerged that described the state of parent and caregiver knowledge and attitudes on food allergen introduction.

First, parents and caregivers expressed limited knowledge and awareness of the recommendations to introduce peanut and other common allergenic foods. Responses varied to questions asked pertaining to the recommendations, with all denoting an inherent need to expand educational efforts on the early introduction guidelines and even fundamental topics to successful implementation like identifying the "Big 9" food allergens, ramifications of an allergic reaction, and the true definition of a food allergy. Next, parents and caregivers expressed immense fear of their child choking on all foods, regardless of allergy risk. As a subtheme to this, when common allergenic foods were discussed, peanuts were the most fear-provoking food among parents and caregivers who were highly apprehensive about introducing them. Participants believed that introducing peanuts in their whole and the processed form of peanut butter was more suitable for children of an older age with significant tooth development, causing introduction to occur later in life. The perception of their child's picky eating surfaced as a common aggravation amongst parents and caregivers and played a notable role in the foods introduced to the child. Several sources of information on feeding practices were identified, including family, friends, WIC, their primary care physician or pediatrician, and the internet and social media. It was clear across all focus groups and participants that the family impacted what

and when their child was fed the most. Specifically, grandmothers/mothers were seen as the most knowledgeable in when, how, and what to feed their children.

The findings of this study add to the notions that most parents and caregivers still do not have a comprehensive understanding of what the recommendations are for introducing common allergenic foods during complementary feeding (Greenhawt, Chan et al. 2018, Samady, Warren et al. 2023), leading to overall poor implementation with introducing these foods during the recommended time (Greenhawt, Chan et al. 2018, Venter, Warren et al. 2022, Samady, Warren et al. 2023), and improper introduction of foods, like peanut, to infants (Lai and Sicherer 2019, Venter, Warren et al. 2022). In contrast, our findings also significantly contribute to the current literature by providing an in-depth look into a particular subpopulation's experience with feeding their children common allergenic foods. Most of the research completed in this relatively new area of research has been focused on obtaining the general parent/caregiver population's knowledge and implementation of the recommendations, as well as other components/considerations that make them more or less viable through quantitative methods. Our findings show that there is nuance within the more general findings from quantitative surveys with nationally representative samples. More nuance may emerge if a similar methodology is adopted and utilized in different subpopulations. For our primarily African American South Georgian parents/caregivers with children enrolled in childcare, the family was indicated to be the most utilized source compared to pediatricians in one study (Lai,et al. 2019}. Another notable difference is that parents and caregivers cited the fear of choking as the primary deterrent to introducing allergenic foods, like peanuts, compared to other studies that report fear of allergic reaction to be the main barrier (Samady, Warren et al. 2023)

This study had several strengths, including leveraging Cooperative Extension's partnerships within the community to obtain a sample that likely provided dependable responses to the questions asked while also helping to improve the recruitment and retention of participants. Having a designated space chosen by the staff member we were connected with at the ECE center greatly benefited our study. This allowed participants to report to a place where they likely felt comfortable and allowed their children also to participate, which could have been a significant hindrance for our participants. In addition, providing a monetary incentive as well as refreshments during the period of time the focus groups occurred (November 2023 – January 2024) for participants likely helped recruitment but also aided participants and their families during the traditionally celebrated holidays in the US.

This study also has weaknesses, such as social desirability bias, which could affect participant responses. This study provided perspectives from parents in South Georgia with children in childcare. This is only one audience for this information. As parents and caregivers serve at the front line as food overseers for infants and young children, it is critical to obtain a comprehensive set of viewpoints to identify barriers to the successful execution of the early introduction recommendations. Thus, future research should explore these topics with different demographics of parents and caregivers. Another limitation of our study was the inability to recruit a South Georgia county with moderate peanut production. Although data met saturation with counties with low and high peanut production, there may have been some sentiments, barriers, and facilitators we could not obtain. It would also likely have benefitted the study to preface verbally what the "Big 9" food allergens were in the United States at the commencement of the focus group. Formerly known as the "Big 8", sesame was added in January 2023, so it is likely that some participants didn't consider this food a common allergen due to its relatively

new appearance compared to the others. In addition, some common food allergens may have been mistakenly grouped together due to perceived commonalities by participants (i.e., shellfish and fish, peanut and tree nuts), which could have caused some misunderstandings throughout our discussions.

Nonetheless, this project revealed relevant areas to act on and further explore to inform future public health strategies. The study findings support the creation of pertinent educational interventions and materials and prompting appropriate partnerships. Knowing that family, particularly maternal figures, play a critical role in our sample's feeding practices for their child can help create resources that can be further tailored to address some of the pros and cons that participants cited in this source. Furthermore, a family history of food allergy was also a mediating factor in what foods were introduced, so highlighting this topic would be integral in these materials. Lastly, providing education on the topic of picky eating and the particular characteristics surrounding would be beneficial.

The community partnerships with early childcare providers through Cooperative Extension were critical in reaching our targeted group and would be a great avenue to disseminate any materials and programs developed. The Cooperative Extension System exists in all 50 states across the US with similar program dissemination models (Buys and Rennekamp 2020). If efforts in Georgia are successful, efforts could be made to work with other Extension systems nationwide to disseminate programming, potentially shifting the culture around the early introduction of common food allergens. Other familiar sources cited by participants, such as WIC and pediatricians, would be effective partnerships to leverage to disseminate this valuable information further. While grandmothers and mothers were the most influential sources of information, participants did note being receptive to information from various sources. It will be

important for parents to receive this information from a variety of authoritative sources and that the message is consistent.

Federal policy targeting the WIC packages and local policies created and enforced in ECE centers and school nutrition programs (SNP) now warrant review. For programs that choose to ban common allergenic foods like peanuts from being served and even entering their facility, a significant opportunity is missed to introduce these into a child's diet. All infants and young children enrolled for care and participating in a Child and Adult Care Food Program (CACFP) center or day care home must be offered a meal that complies with meal pattern standards set by the USDA. All nine major food allergens and foods containing them can be part of a reimbursable meal if they are in an appropriate form for the child. After allergenic foods have been introduced at home and it has been determined that there is a limited risk of allergic reaction, introducing these foods can continue at the center according to the individual feeding plans, which could support adherence to the guidelines through sustained exposure over time. Similarly, school nutrition programs have nearly identical requirements of CACFP through the School Breakfast Program (SBP) and National School Lunch Program (NSLP) for meals to contain specific components to meet reimbursement rates with rules and regulations made pertaining to the omittance of foods on the local level. Encouraging school nutrition professionals to plan and not ban common allergenic foods could be a way to increase the introduction of common food allergens in young children. This multi-level approach of encouraging and providing opportunities for children to be exposed to common allergenic foods could be pivotal to reducing the prevalence of food allergies state and nationwide.

Overall, this thesis provided useful information to guide subsequent research on the early introduction of common allergenic foods and to inform educational strategies to improve

knowledge and implementation of the guidelines and ultimately reduce the food allergy burden in the US. For most health behaviors, individuals need multilevel support for success. There are opportunities for policymakers and key groups to come alongside parents and caregivers to make their own impact on minimizing the occurrence of food allergies.

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APPENDIX A

EXTENDED REFLEXIVITY STATEMENT

Reflexivity Statement

Research Team and Subjectivity Statement

Reflexivity is a process that involves researchers participating in self-reflection to help aid in the identification of biases and subjectivities, thus becoming aware of how they inform and impact the research process. [116] Through iterative bouts of active reflection before, during, and after the research process, there is greater potential to utilize this critical thinking process to guide qualitative research so that it is insightful. [116] Other research teams engaging in similar methods of qualitative research have utilized reflexivity in various ways to help audiences ensure that data and findings are trustworthy and determine the impact of how the researcher's role influence the study participants. [117-119]

The research team consisted of the principal investigator, who is a doctoral-level registered dietitian (AB), a primary student researcher (QW), a secondary student researcher (MA), and two Extension Professionals (CG & AG), all of whom were trained and experienced in basic research methods and those involved in data analysis (AB, QW, and MA) were trained in qualitative research methods. The principal investigator identified as a white female parent. The primary student researcher identified as a black male without children. The secondary student researcher and two supporting Extension professionals identified as white females without children.

I acknowledge that I am a Black male formally diagnosed with a peanut allergy, which I have outgrown. When I was younger, I experienced a severe allergic reaction resulting in anaphylaxis and a visit to my local emergency room, where I was hospitalized for more than 24 hours. That said, I am familiar with the impact of food allergies on children and the parents/caregivers responsible for them. The study participants (parents/caregivers) view me as a graduate student who works for one of the Extension Nutrition and Health Specialists within UGA Cooperative Extension. The Extension Nutrition and Health Specialists have programmatic responsibilities related to food, nutrition, and health that Extension professionals utilize in their respective counties in Georgia. As mentioned earlier, I am a graduate student pursuing my master's degree in Nutritional Sciences while also pursuing my dietetic internship. With that said, I have almost six years of experience centered around food and how it relates to human health and nutrition, as well as many experiences within several clinical, community, and food service spaces. It is also important to mention that I have a limited amount of responsibility and

experience in providing care for infants and young children, so I may not truly understand the inner workings of caregiving and the difficulties it may bring.

Throughout the data collection and analysis process, I acknowledge that I have never resided in Georgia until my graduate studies nor worked for Cooperative Extension in any capacity before this. Despite my initial lack of familiarity with Extension as an organization, I have grown to understand and respect their mission and intentions and have become very appreciative of all the work they do to foster and maintain healthy communities. The importance of each participant sharing their experiences and points of view was heavily emphasized throughout each focus group. It was acknowledged that each person has different experiences as a parent and caregiver and a different view as a person, so there were no right or wrong answers. Therefore, in the focus groups, I sought to understand each parent and caregiver's viewpoint on the early introduction of common allergenic foods to their children and their knowledge of the recommendation to introduce all common food allergens during the complementary feeding phase for a reduction of risk for food allergies in children. Throughout each focus group, I made it apparent that my experience as a caregiver was limited and encouraged participants to share their experiences freely to help me understand all aspects of providing for the child they care for

APPENDIX B

FOCUS GROUP PARTICIPANT RECRUITMENT SCRIPT

Focus group participant recruitment – email:
Dear Parent or Caregiver,
UGA Extension helps families with many issues related to home, food, budgets, and relationships. We are very interested in helping families eat healthy, and giving parents and caregivers the tools they need to feed their children with confidence and health in mind. I am inviting you to participate in a study to learn about how you get information about feeding your child and your understanding of when and how peanuts and other food allergens should be introduced to infants and young children. We also want you to tell us what you think about some materials for parents/caregivers on feeding peanuts to infants and young children. The goals of this study are to use the information you provide to:

1. help us create educational materials and programs about this topic
2. inform how to get these programs and materials to you and others

If you choose to participate, you would have a discussion with other parents and caregivers called a focus group. The focus group will take about 1 hour and you can earn a $15 gift card for participating.
You must be 18 years or older and be a parent or caregiver of at least one child 3 months to 6 years who is enrolled in childcare. You must have responsibility for feeding the child at least 4 times per month. If you think you are interested in participating, please visit the following link to learn more about the study. (insert link to consent form and enrollment)

Thank you,

Alison C. Berg

Focus Group Participant Recruitment – verbal:
Dear Families,

UGA Extension helps families with many issues related to home, food, budgets, and relationships. We are very interested in helping families eat healthy, and giving parents and caregivers the tools they need to feed their children with confidence and health in mind. They are inviting you to participate in a study to get your opinions about some educational materials on feeding infants peanuts for the first time. They also want to learn about where you get your

information on feeding infants and young children and how best to get new information to you. Please see this flyer and others posted around the center. Use the information on the flyer to respond if you are interested

APPENDIX C

PARTICIPANT FOCUS GROUP CONSENT FORM

UNIVERSITY OF GEORGIA
CONSENT LETTER

Caregiver and Professional Knowledge and Beliefs about Peanut and Other Food Allergies and Introduction

Dear Participant,

My name is Alison Berg and I am a faculty member in the Nutritional Sciences Department at the University of Georgia. I also work with UGA Extension. UGA Extension helps families with many issues related to home, food, budgets, and relationships. We are very interested in helping families eat healthy, and giving parents and caregivers the tools they need to feed their children with confidence and health in mind. I am inviting you to participate in a research study to learn about how you get information about feeding your child and your understanding of when and how peanuts and other food allergens should be introduced to infants and young children. We also want you to tell us what you think about some materials for parents/caregivers on feeding peanuts to infants and young children. This study is funded by the Southern Peanut Growers.

The **goals of this study** are to use the information you provide to:

1. help us create educational materials and programs about feeding peanuts and other food allergens to infants for the first time
2. inform how to get these programs and materials to you and others

Who can participate?

- Adults 18 years or older
- Must be a parent or caregiver of at least one child age 3 months to 6 years
- Must be responsible for feeding the child at least 4 times per month
- Must have at least one child enrolled in a childcare center

What do I have to do?

- Meet and talk with other parents and caregivers for about 1 hour
- Share how you feel about feeding peanuts and other foods to children for the first time
- Answer questions about where you get information on feeding your children
- Tell us what you think about some materials for parents/caregivers on feeding peanuts to infants and young children

Do I have to participate? No. Participation is voluntary. You can refuse to take part or stop at any time. There are no consequences (penalties) for stopping or choosing not to participate. Your decision to participate will not affect your participation in Head Start, other childcare or UGA

Extension programs. If you decide to stop or withdraw from the study or the investigator terminates your participation, the information/data collected from or about you up to the point of your withdrawal will be kept as part of the study and may continue to be analyzed. If any questions make you uncomfortable and you do not want to answer them, you can skip these questions.

Focus group recording and confidentiality: The researchers will tell all participants that what they say during the focus group session should be kept confidential and not shared with others. However, it is still possible that participants may repeat comments outside of the group at some time in the future. Please do not say your name during the focus group so your comments can be anonymous. The focus group will be recorded so we don't miss anything you say. All recordings will be kept confidential. In order to make a written copy of the audio recordings obtained, a third-party transcription provider called Rev.com will be used. Your confidentiality will be maintained to the degree permitted by the technology used. Only research team members will have access to these recordings and transcriptions. When we make a written copy of the audio recordings, we will remove any names accidentally mentioned and replace them with a fake name to protect your privacy. Your anonymous responses may be shared with other researchers and/or for future studies without additional consent. The research study's results may be published, but your name or any identifying information will not be used. In fact, the published results will be presented in summary form only.

Are there any risks associated with participating? The only risks associated with the research are breach of confidentiality and feeling uncomfortable about answering questions. You may skip any questions that make you feel uncomfortable. Please see the previous sections about keeping your responses confidential.

What will I get for participating? Upon completion of the focus group, you will receive a $15 incentive. Payment for participating in this study will be made using ClinCard, a pre-paid VISA that works like a pre-paid debit card. We will give you the card and money will be added to your card based on the study's payment schedule. You may use this card online or at any store that accepts VISA. We will provide you with an information sheet about the ways you can use the card, some of which may involve fees that will reduce the amount of money on the card. The card is run by Greenphire, an independent company specializing in payments for research studies and clinical trials. Be sure to read this information, including the cardholder agreement from Greenphire. To issue your card, we need to give Greenphire some of your personal information (or your child's). If you do not wish to provide this information, you can still take part in the study, but you will not be paid. Banks and other financial institutions can access this information if they need to verify your identity when you use your card. Greenphire will be given your name, address, and date of birth. They will use this information only as part of the payment system, and it will not be given or sold to any other company. If a single payment is over $100 or we anticipate that you will earn more than $600 in one year from participating in UGA research projects, you will need to complete a tax form and provide your social security number. If you earn more than $600 from UGA research in one year, UGA must report this to the IRS, and you

will receive a 1099 form. This may affect your taxes. If you decide to stop participating at any point during the focus group, you will not receive the gift card.

What if I have questions? If you have questions about this research, you may ask them now or please feel free to contact me at 706-542-8860, alisoncberg@uga.edu. If you have any complaints or questions about your rights as a research volunteer, contact the IRB at 706-542-3199 or by email at IRB@uga.edu.

Please keep this letter for your records. By choosing to stay and participate in the focus group now, you agreeing to participate in the study and have the focus group recorded. If you do not want to participate, please let us know now and you can leave the room.

Sincerely,

Alison C. Berg, PhD, RDN, LD
Associate Professor and Extension Nutrition and Health Specialist
202 Hoke Smith Annex, 300 Carlton St.
Athens, GA 30602
p: 706-542-8860
e: alisoncberg@uga.edu
w: www.fcs.uga.edu/extension

APPENDIX D

FOCUS GROUP DEMOGRAPHIC QUESTIONS

Caregiver and Professional Knowledge and Beliefs about Peanut and Other Food Allergies and Introduction – Intro Questions

1. What is your parent status? ☐ Parent ☐ Grandparent ☐ Other caregiver: please describe: _____	**2. Please write the age of the children in the household or that you are a regular caregiver. Once you have added the children in your household, you may leave the rest blank.** Child 1's Age: _____ Child 2's Age: _____ Child 3's Age: _____ Child 4's Age: _____ Child 5's Age: _____ Child 6's Age: _____ Child 7's Age: _____ Child 8's Age: _____ Child 9's Age: _____ Child 10's Age: _____
3. What is your age in years? Years: _____	**4. Please select which is best to describe your gender.** ☐ Male ☐ Female ☐ Other ☐ Prefer Not to Say
5. Please select which of the following is best to describe your race. ☐ White ☐ Black ☐ Asian ☐ Pacific Islander ☐ American Indian ☐ Two or More Races	**6. Please select which of the following is best to describe your ethnicity.** ☐ Hispanic or Latino ☐ Non-Hispanic or Latino ☐ Prefer Not to Say

☐ Other ☐ Prefer Not to Say	
7. Were you born in the United States or outside of the United States of America (USA)? ☐ USA ☐ Outside USA	**8. What is the highest level of education you have received?** ☐ Some high school but did not graduate. ☐ High school diploma or GED. ☐ Some college or technical school but did not graduate. ☐ Technical School or Associate's degree (2-year college) ☐ College graduate (Bachelor's degree) ☐ Graduate degree (Master's, Doctoral, Specialist, etc.)
9. Do you have a food allergy? ☐ Yes ☐ No	**10. If you have a food allergy, what food(s) are you allergic to? Check all that apply:** ☐ Peanut ☐ Tree Nut ☐ Egg ☐ Fish ☐ Shellfish ☐ Soy ☐ Wheat ☐ Sesame ☐ Milk ☐ Other food, please explain: _____
11. Does anyone in your family or a very close friend have a food allergy? ☐ Yes ☐ No	**12. If they do, to what food(s) are they allergic to? Check all that apply:** ☐ Peanut ☐ Tree Nut ☐ Egg ☐ Fish ☐ Shellfish ☐ Soy ☐ Wheat ☐ Sesame ☐ Milk ☐ Other food, please explain: _____

APPENDIX E

FOCUS GROUP INTERVIEW GUIDE

Introduction/Consent

Hello everyone! I so appreciate you taking the time to talk with me today to share your thoughts on how you get information about feeding your child and your understanding of when and how peanuts and other food allergens should be introduced to infants and young children. We also want you to tell us what you think about some materials for parents/caregivers on feeding peanuts to infants. This focus group is part of the research described to you in the consent letter provided today. Please review the consent letter now and ask any questions that you may have. [provide time for participants to review]

We will record the audio of this focus group. But, your name and any other identifying information will be removed before the recording is analyzed for research.

If you no longer want to participate in this focus group, you are welcome to leave the room now. We will give you a moment to do that. (Researchers will pause to allow participants to opt out.) Does anyone have any questions? Okay, let's get started!

Focus group introduction:

Before we get started with our discussion, we have given you each a card with a participant number and a few questions that we would like you to complete. These questions help us understand who is in the room. This is important for when we try to understand your responses in today's discussion and how we might create programs or educational materials for different people. Please take a moment to respond to those questions.

Questions that participants will answer:

1. What is your parent status?
    a. Parent
    b. Grandparent
    c. Other Caregiver
2. Please write the age of the children in the household or that you are a regular caregiver. Once you have added the children in your household, you may leave the rest blank.
    a. Child 1's Age: _____
    b. Child 2's Age: _____
    c. Child 3's Age: _____
    d. Child 4's Age: _____
    e. Child 5's Age: _____

f. Child 6's Age: _____
g. Child 7's Age: _____
h. Child 8's Age: _____
i. Child 9's Age: _____
j. Child 10's Age: _____

3. What is your age in years?
4. Preferred gender – female, male, transgender, prefer not to say
5. Race- White, Black or African American, American Indian or Alaska Native, Asian, Native Hawaiian, or Other Pacific Islander, Some other race
6. Ethnicity – Hispanic/non-Hispanic, prefer not to say
7. Were you born in the United States or outside of the United States of America (USA)?
8. Education status - Some high school but did not graduate, High school diploma or GED, Some college or technical school but did not graduate, Technical School or Associate's degree (2-year college), College graduate (Bachelor's degree), Graduate degree (Master's, Doctoral, Specialist, etc.).
9. Do you have a food allergy? If so, to what foods:
    a. Peanut
    b. Tree nut
    c. Egg
    d. Fish
    e. Shellfish
    f. Soy
    g. Wheat
    h. Sesame
    i. Milk
    j. Other food, please explain:_____

10. Does anyone in your family or a very close friend have a food allergy? If so, to what food(s) (check all that apply)
    a. Peanut
    b. Tree nut
    c. Egg
    d. Fish
    e. Shellfish
    f. Soy
    g. Wheat
    h. Sesame
    i. Milk
    j. Other food, please explain:_____

Thank you for taking the time to complete these questions. Please know that we take your privacy and your willingness to share with us seriously. When you speak for the first time today, I'll ask you to either say your first name or the participant number. Whichever you are more comfortable with. We are recording the session because we don't want to miss any of your comments. If you use your name, we will remove your name and replace it with an ID number when we transcribe or write down the responses from today's focus group recording.
If you plan to use your first name today when you're speaking, go ahead and write that on your survey card. If not, just use your participant number to identify yourself when speaking. Please speak one at a time. If several people are talking at once, the recording will become unclear, and we might miss your comments.

We will be asking the group a series of questions. There are no right or wrong answers. Each of you has a different experience as a parent or caregiver and a different view as a person. Please feel free to share your point of view, even if it differs from what others have said.

Our session will last about 60 minutes. We'll start with questions about your own experiences. Later, we will look at some materials and get your opinion.

Focus Group Questions

Feeding practices – Knowledge, beliefs, sources of information

1. Please take a minute to think about when you started feeding your baby solids for the first time. I'm going to ask that you each please share one memory about feeding your child or grandchild for the first time. If you are expecting your first child, tell us one thing that you are looking forward to with feeding.
2. Can you tell me what your initials feelings were when feeding your baby for the first time?
    a. Prompt: Why did you feel this way?

3. How did you know what to feed your baby or the children you care for first?
    a. Prompt: Where did you get that information?
    b. Prompt: Who or what sources were the most helpful or important to you as you began to move your baby from only formula or breast milk to eating solid foods?
4. Tell me about what you knew or were told about giving your baby foods that are more likely to cause food allergies, like peanuts, to your baby?
    a. Prompt: where did you get this information?
5. Tell me about how and when you should give peanuts or peanut products to your baby for the first time?
6. Can you tell me what you know about feeding other foods that are likely to cause food allergies, like eggs, fish, or shellfish to babies?
7. Where and/or how do you like to get information on how and what to feed your baby?