



Early Infant Feeding

A Window to Prevent Food Allergies

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Today's Speakers



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Disclosures

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● Director of Nutrition: Rejuvenan Global Health

Objectives:

- Develop feeding plans for babies at risk of food allergy using finding from the LEAP study.
- Compare early introduction guidelines for peanuts versus eggs and other potential allergens.
- Modify common allergen containing foods and meals for infants to safely consume them and identify products that are appropriate for early introduction.



Poll Questions #1

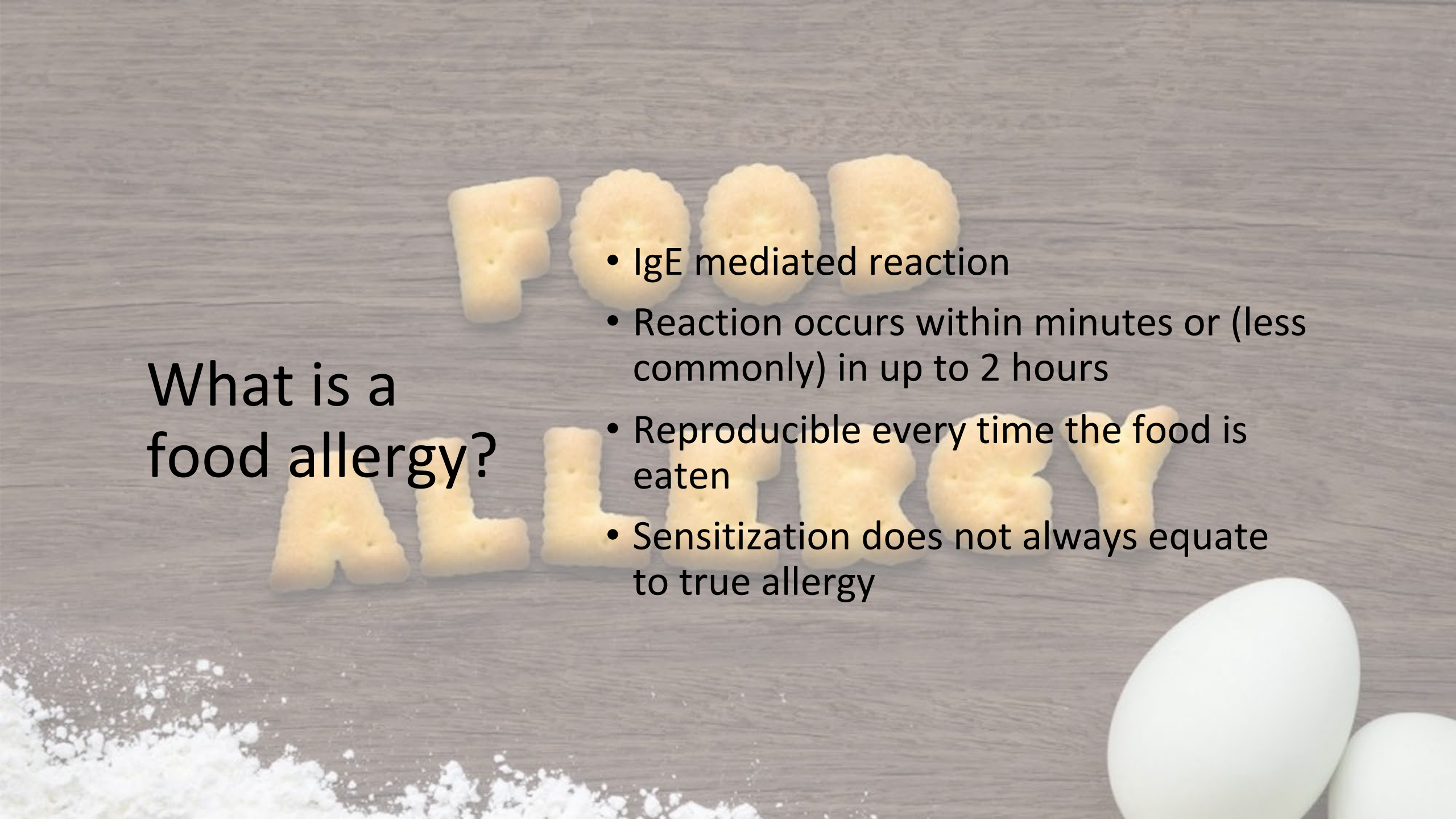


Food Allergy Fast Facts

- **Prevalence** is between 6-8% in children and up to 10.8% in adults
- **Costly** in terms of finances, healthcare use, and psychosocial measures
- **Societal Confusion** over true allergy vs other adverse reactions to food
 - Overestimation of prevalence
 - Reduces empathy for those truly allergic
 - School bans increase risk of adverse outcomes
- **Prevention Works** but there's a critical window...

What is a food allergy?

- IgE mediated reaction
- Reaction occurs within minutes or (less commonly) in up to 2 hours
- Reproducible every time the food is eaten
- Sensitization does not always equate to true allergy





FARE

Food Allergy Research & Education

www.foodallergy.org

For a suspected or active food allergy reaction:

FOR ANY OF
THE FOLLOWING





SEVERE SYMPTOMS

-  **LUNG:** Short of breath, wheezing, repetitive cough
-  **HEART:** Pale, blue, faint, weak pulse, dizzy
-  **THROAT:** Tight, hoarse, trouble breathing/swallowing
-  **MOUTH:** Significant swelling of the tongue and/or lips
-  **SKIN:** Many hives over body, widespread redness
-  **GUT:** Repetitive vomiting or severe diarrhea
-  **OTHER:** Feeling something bad is about to happen, anxiety, confusion



OR MORE
THAN ONE

MILD SYMPTOM

-  **NOSE:** Itchy/runny nose, sneezing
-  **MOUTH:** Itchy mouth
-  **SKIN:** A few hives, mild itch
-  **GUT:** Mild nausea/discomfort

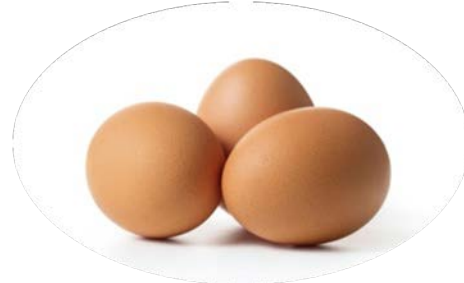


1. **INJECT EPINEPHRINE IMMEDIATELY.**
2. **Call 911.** Request ambulance with epinephrine.

Do not depend on antihistamines. When in doubt, give epinephrine and call 911.

Signs and
Symptoms

The Big 8



Poll Question #2





The Evolution of Infant Nutrition Needs

Infant Nutrition: Birth through ~6 Months



This Photo by Unknown Author is licensed under [CC BY-NC-ND](#)

Physically/Developmentally

Suck-Swallow-Breathe



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Nutritionally

Breastmilk

Formula

Supplements: Vitamin D if
exclusively breastfed

Infant Nutrition: ~6 Through 12 Months



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Physically/Developmentally

- Increasing neck/trunk strength
- Sitting up
- Developing mastication
- Self-feeding/drinking from open cup



Nutritionally

- Breastmilk or Formula AND
- Early Complementary Foods (starting by 6 months, but not before 4 months)
- Need iron rich foods, continue vitamin D

Toddler Nutrition: 1-3 Years



Physically/Developmentally

Autonomy

Fully mobile

Fully self-feeding



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Nutritionally

Diverse diet

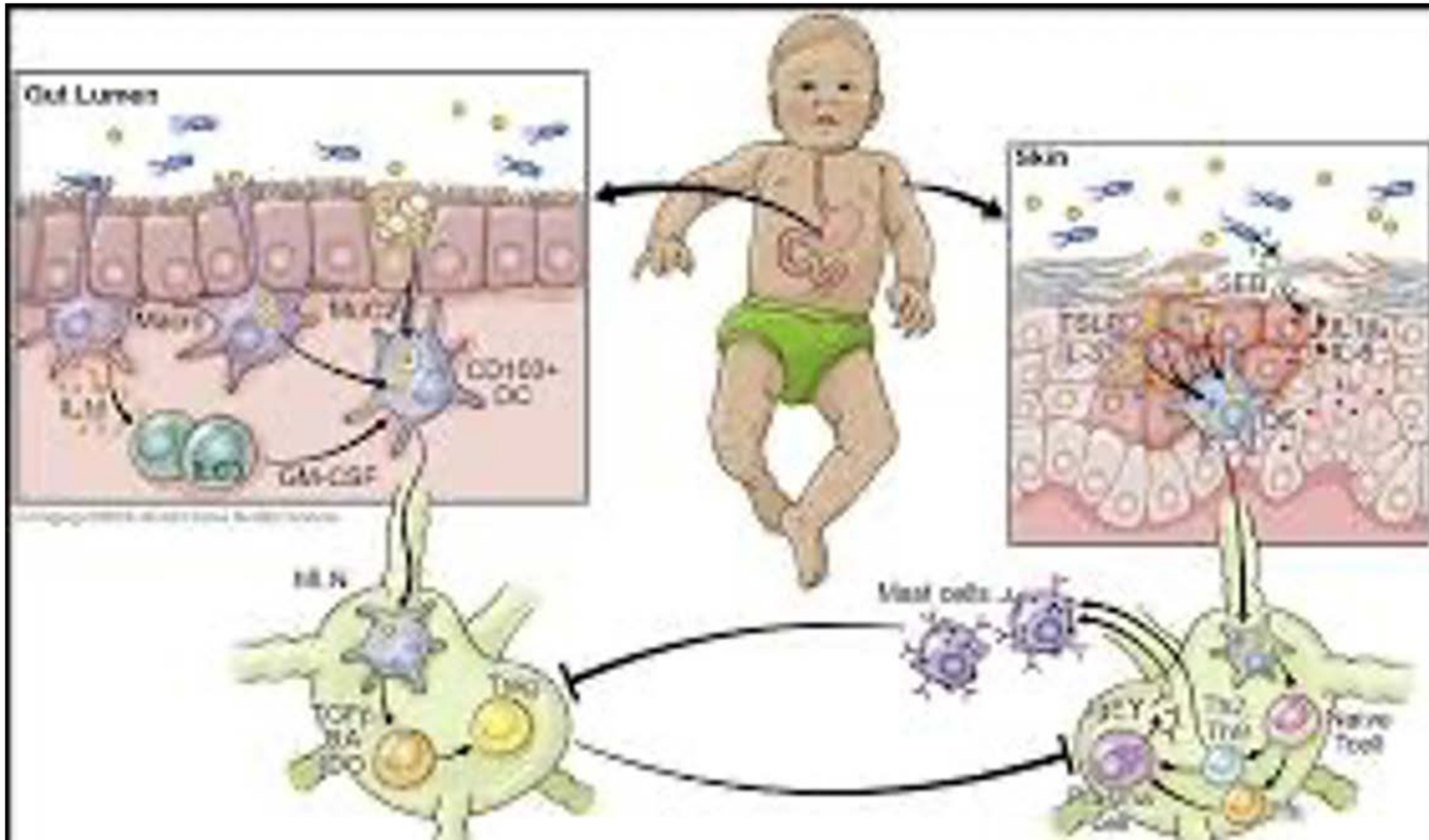
Ongoing palate development

Weaning to milk

Consider multivitamin

A close-up photograph of a young child with dark skin and curly hair sitting at a wooden table. The child is wearing a white long-sleeved shirt with small red hearts. An adult's hand is holding a white bowl with a blue rim in front of the child, and another hand is holding an orange spoon, feeding the child. The background is softly blurred, showing a wooden chair and a person's arm.

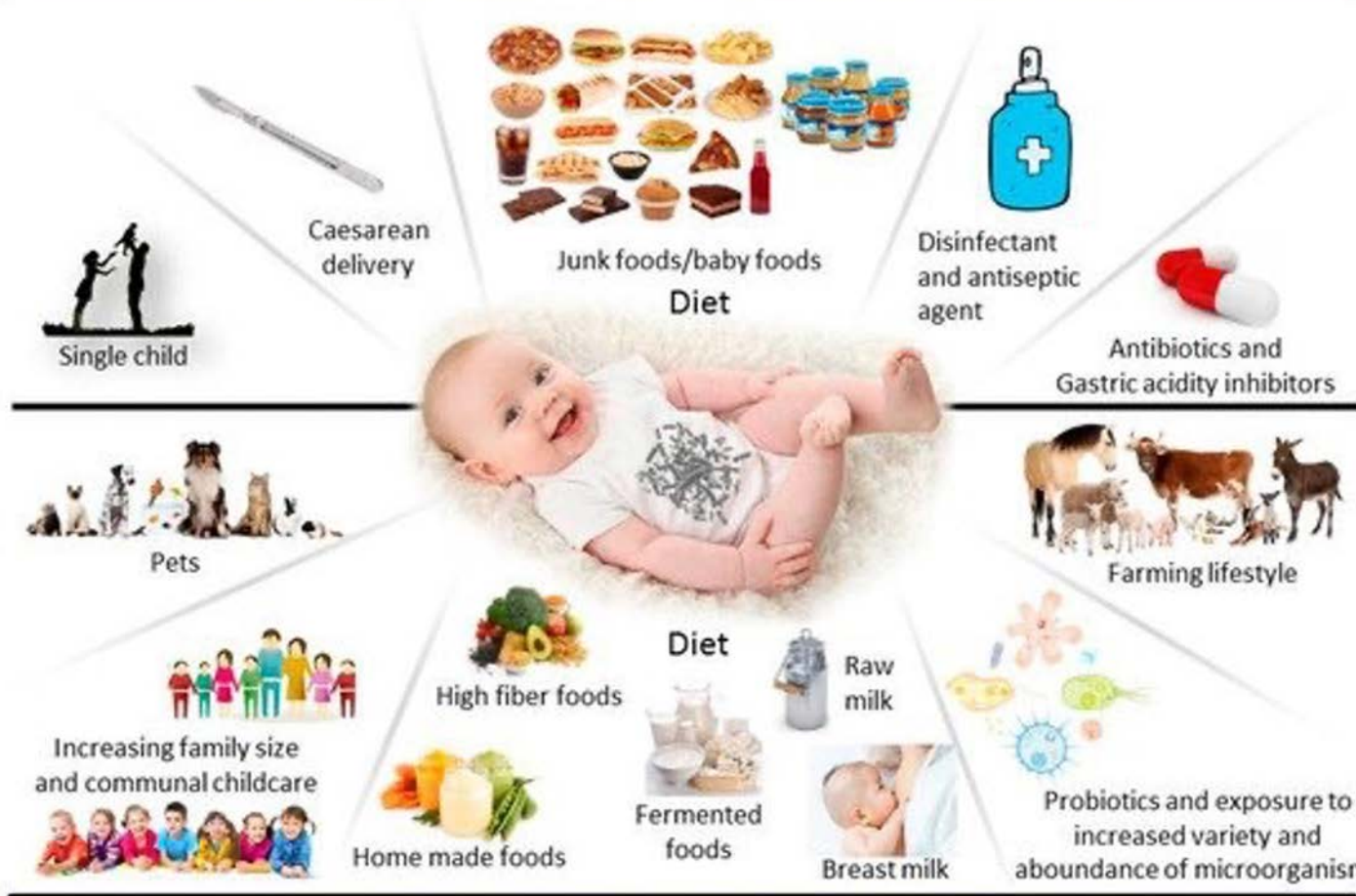
The Science Behind Early Introduction: The Critical Window



The Immune System: Skin, Gut, Cellular

Tordesillas, L, et al. Immunology of Food Allergy.
[https://www.cell.com/immunity/pdf/S1074-7613\(17\)30287-X.pdf](https://www.cell.com/immunity/pdf/S1074-7613(17)30287-X.pdf)

MICROBIAL RELATED FACTORS INCREASING RISK OF ALLERGY

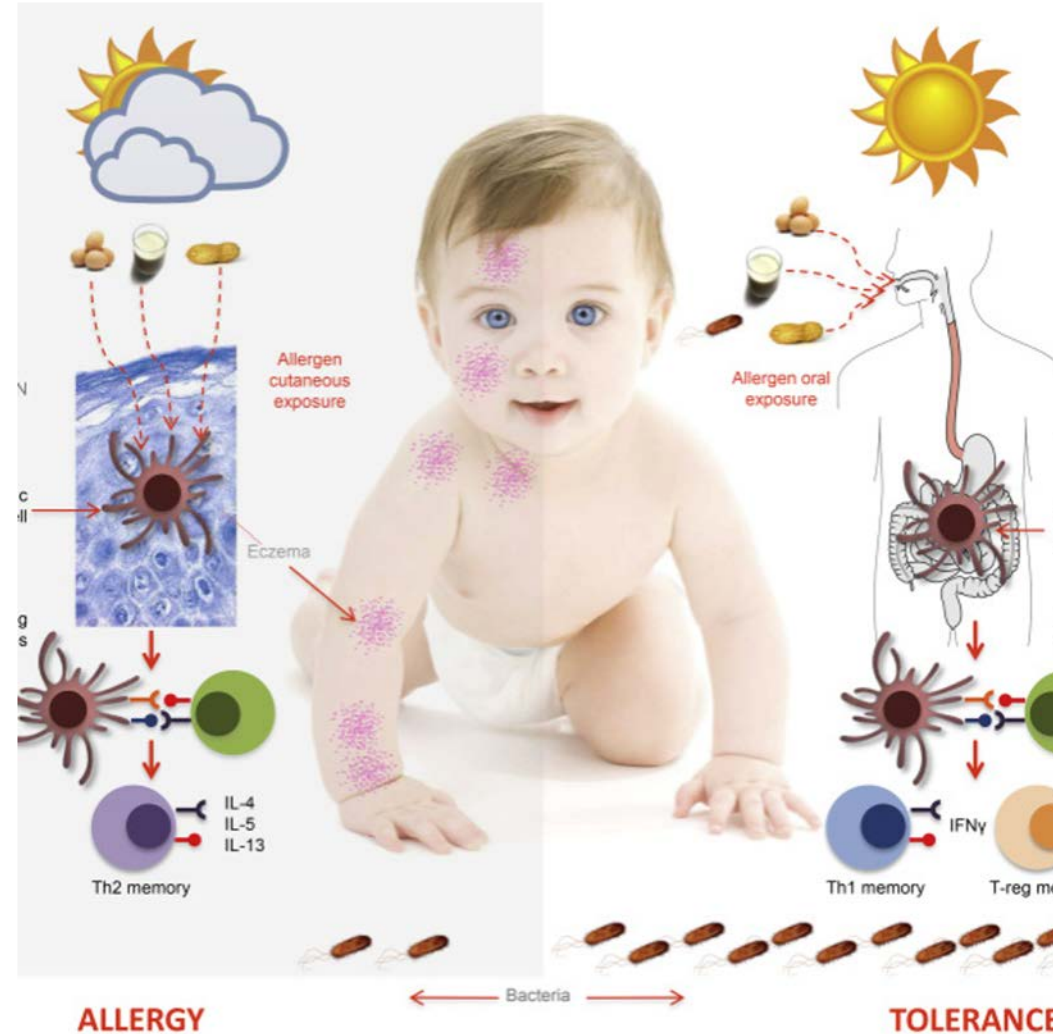


MICROBIAL RELATED FACTORS REDUCING RISK OF ALLERGY

Infant Microbiota and Food Allergies

Aitoro, R, et al. Gut microbiota as a target for preventive and therapeutic intervention against food allergy. <https://www.mdpi.com/2072-6643/9/7/672/htm>

Dual Exposure Hypothesis



A Remarkable Difference



Learning Early About Peanut allergy (LEAP)

- 640 infants at high-risk for peanut allergy d/t egg allergy or mod/severe eczema
- Half ate peanut foods at 4-11 months
- Half avoided
- Up to 86% reduction in peanut allergy at the end of 5 years
- Early introduction is safe and effective



Enquiring About Tolerance (EAT)

Recruited breastfed infants for early intro of 6 foods

- Milk
- Egg
- Peanut
- Wheat
- Sesame
- Fish

Outcomes:

- Difficult to adhere to protocol
- Decreased food allergies overall in the EAT babies
- Decreased peanut and egg allergy in per protocol when 2g protein per week or more each was eaten



Child Study

Study design

- N=2669 birth through 3 years
- Population cohort study
- Compared rates of sensitization to peanut, egg, and milk among those who ate these foods early to those who ate them later

Results

“General-population infants introduced to peanut after age 12 months were more likely to have sensitization and probable clinical allergy to peanut at 3 years.”

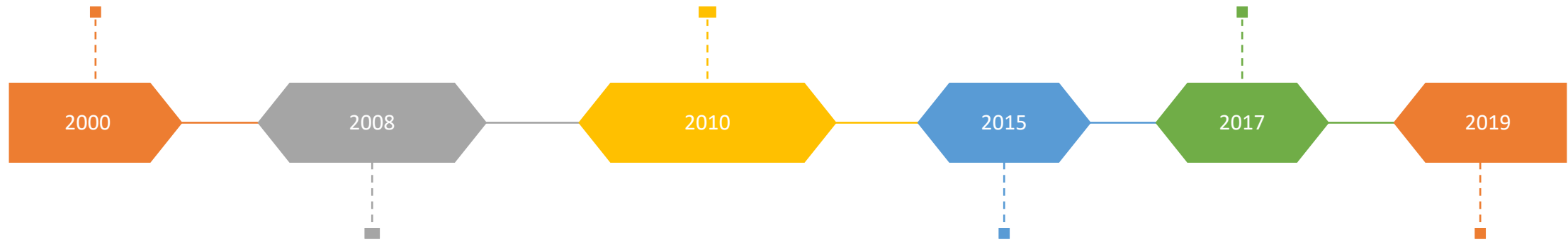
PETIT Trial

- Two step introduction of egg to 147 high-risk (eczema) infants
- Used heated egg white powder
 - 50mg/day at 6 months-9 months
 - 250mg/day 9months-12 months
- Stopped early because it so successfully reduced egg allergy



Quick History of Feeding Guidelines

AAP
recommended
avoiding the
top allergens
for 1, 2 or 3
years



NIAID Guidelines for
the Diagnosis and
Management of Food
Allergies

NIAID
Addendum to
the Guidelines

Rescinded guidance
on avoidance, stating
that the research
doesn't support
avoidance as a way to
prevent allergies,
"more research is
needed"

Consensus
Report

AAP Revised Report
The Effects of Early
Nutritional
Interventions on the
Development of
Atopic Disease in
Infants and Children

NIAID Addendum Guidelines

Group 1 (High-risk)

Infants with egg allergy or severe to moderate eczema or both

- Discuss with pediatrician or allergist before introducing peanut foods
- Skin prick testing may be recommended
- Depending on SPT results, first oral intro may happen at doc's office
- Intro recommended at 4-6 months
- Children should eat 2g peanut protein three times per week thereafter

Group 2 (Moderate-risk)

Infants with mild eczema

- Not necessary to discuss with pediatrician first, but may
- Should introduce at home
- At or after 6 months

Group 3 (Low-risk)

Infants without risk factors

- Introduce at home at or after 6 months
- Age-appropriate and in accordance with family preferences and cultural practices

AAP Guidance

There is no evidence that delaying the introduction of allergenic foods, including peanuts, eggs, and fish, beyond 4-6 months prevents atopic disease.

There is now evidence that the early introduction of infant-safe forms of peanuts reduces the risk for peanut allergies. Data are less clear for timing of introduction of eggs.

The new recommendations for the prevention of peanut allergy are based largely on the LEAP trial and are endorsed by the AAP.



A photograph of a woman feeding a baby with a spoon while a man looks on. The woman is on the left, wearing a white sweater, and the man is on the right, wearing a light blue button-down shirt. The baby is in the center, wearing a brown and white patterned sweater. The background is softly blurred, showing what appears to be a dining table with plates. A thin vertical orange line is positioned above the baby's head.

A Public Health Approach to Food Allergy Prevention

DGA Dietary Guidelines for Americans
2020 - 2025

Make Every Bite Count With the Dietary Guidelines

USDA
DietaryGuidelines.gov

CHAPTER **2**
Infants and Toddlers

Dietary Guidelines for Americans, 2020-2025 | Chapter 2: Infants and Toddlers | Page 52

CHAPTER **5**
Women Who Are Pregnant or Lactating

Dietary Guidelines for Americans, 2020-2025 | Chapter 5: Women Who Are Pregnant or Lactating | Page 138

Dietary Guidelines for Americans 2020-2025

Here's what the DGAs say about introducing allergens...

*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.***

Introduce Infants to Potentially Allergenic Foods Along With Other Complementary Foods

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. Cow milk, as a beverage, should be introduced at age 12 months or later (see "[Establish a Healthy Beverage Pattern](#)"). There is no evidence that delaying introduction of allergenic foods, beyond when other complementary foods are introduced, helps to prevent food allergy. For more information, see "[For Infants at High Risk of Peanut Allergy, Introduce Peanut-Containing Foods at Age 4 to 6 Months.](#)"



BIRTH THROUGH 23 MONTHS



For Infants at High Risk of Peanut Allergy, Introduce Peanut-Containing Foods at Age 4 to 6 Months

If an infant has severe eczema, egg allergy, or both (conditions that increase the risk of peanut allergy), age-appropriate, peanut-containing foods should be introduced into the diet as early as age 4 to 6 months. This will reduce the risk of developing peanut allergy.

Caregivers should check with the infant's healthcare provider before feeding the infant peanut-containing foods. A blood test or skin prick may be recommended to determine whether peanut should be introduced to the infant, and, if so, the safest way to introduce it. More information is available in the [Addendum Guidelines for the Prevention of Peanut Allergy in the United States](#) at niaid.nih.gov/sites/default/files/addendum-peanut-allergy-prevention-guidelines.pdf

And for high risk infants...

*For Infants at **High Risk** of Peanut Allergy, Introduce Peanut-Containing Foods at Age 4 to 6 Months*

- *Severe eczema*
- *Egg allergy*

Check with healthcare provider before introducing peanut foods.



For Infants at High Risk of Peanut Allergy, Introduce Peanut-Containing Foods at Age 4 to 6 Months

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Poll Questions #3





How to Feed Babies Potential Allergens

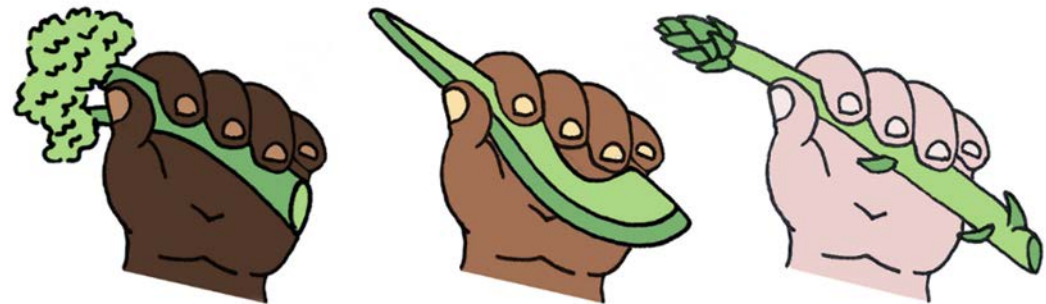
Introducing Complementary Foods

- Options for starting solids (choose what works best for you and your baby)
 - Traditional Approach
 - Combined Approach
 - Baby-Led Weaning



Baby-Led Weaning

- Family meals
- Strengthens internal self-regulation system
- More minimally-processed, nutrient-dense, fresh foods
- More adventurous eating and less food fussiness
- Boosts fine motor skills
- Saves money & time



<https://pubmed.ncbi.nlm.nih.gov/27154478/>
<https://bmjopen.bmj.com/content/2/1/e000298.short>
<https://www.ncbi.nlm.nih.gov/pubmed/28692728>
<https://www.ncbi.nlm.nih.gov/pubmed/28542555>
<https://pubmed.ncbi.nlm.nih.gov/29205569/>

At what age should babies start solids?

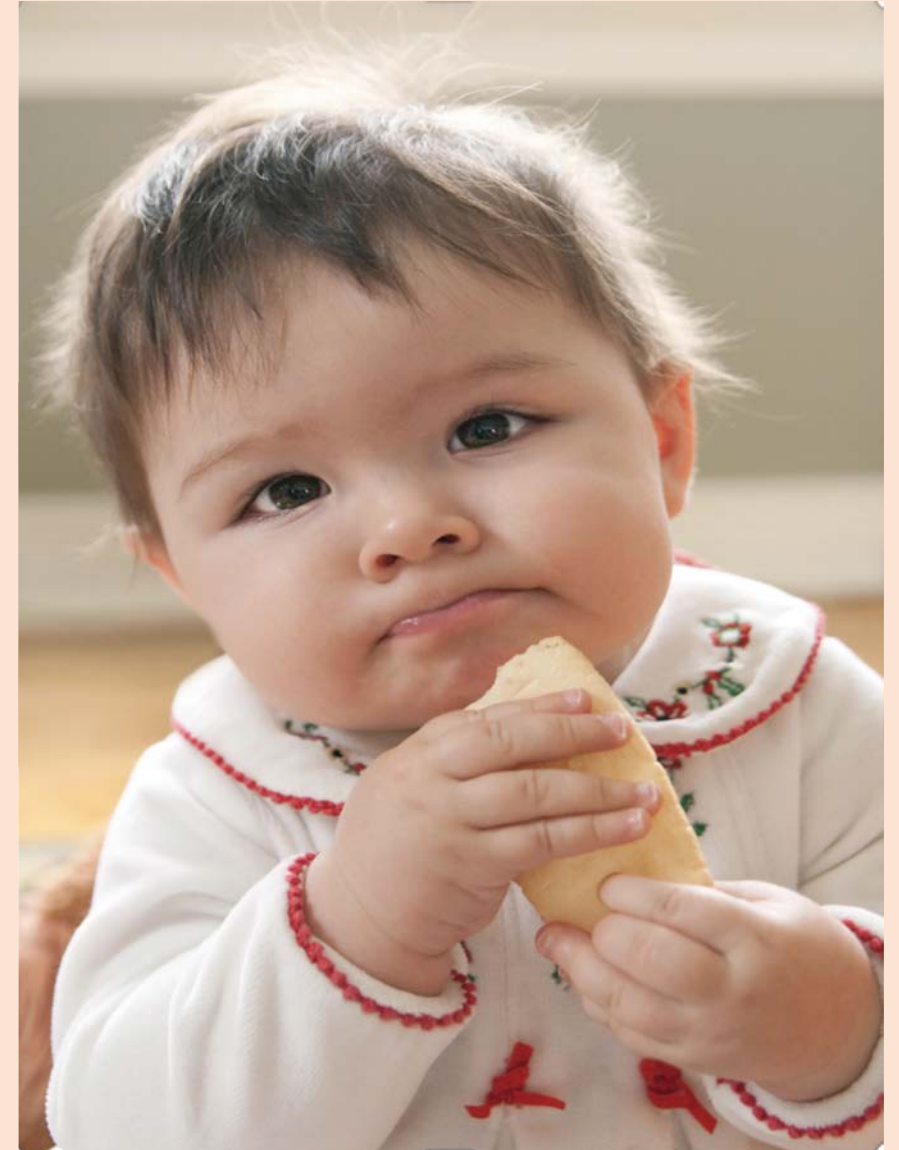
- Lots of confusion and changing guidelines over the past several decades
- Risks associated with starting too early (obesity) too early & too late (type 1 diabetes, celiac) and too late (delayed oral motor function & food/texture aversions)
- WHO, AND & AAP and the new DGAs all now recommend starting solids at ~6 months of age when the developmental signs of readiness are present



Myth or Truth? “Food before one is just for fun...”

Also important for:

- Meeting nutrient needs
 - Most notably iron (also zinc)
- Meeting developmental milestones
- Learning & practicing self-feeding skills
- Building baby’s palate & acceptance of a wide variety of foods, flavors & textures early on
- Preventing the development of food allergies



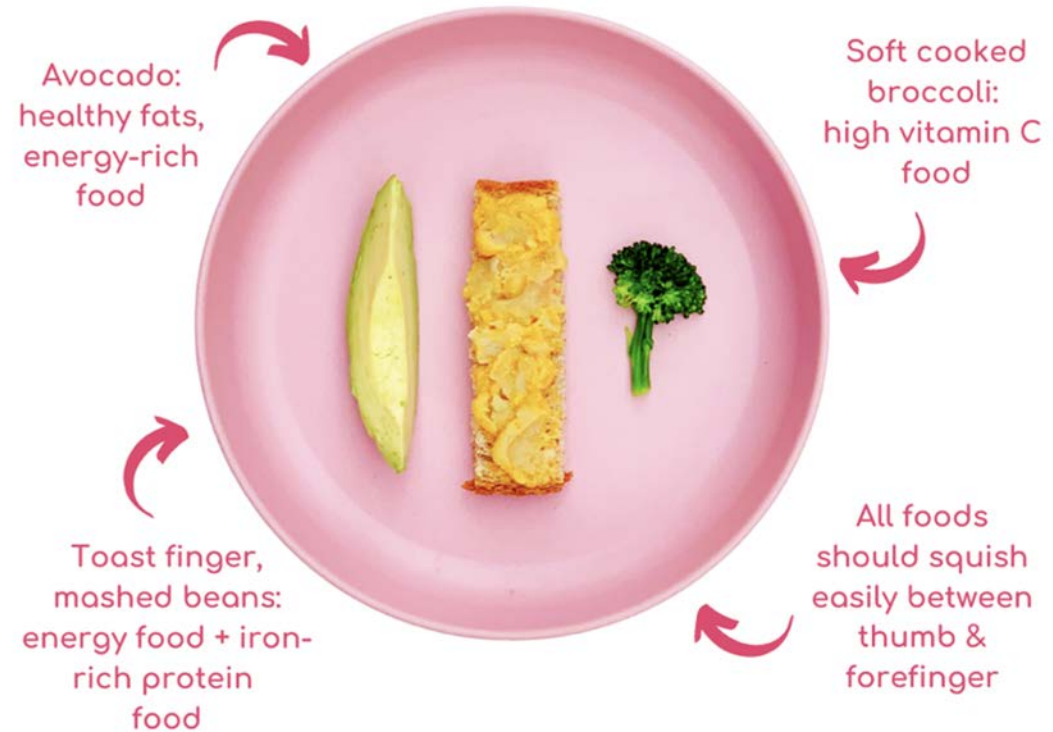
Top Priorities for Starting Solids (UPDATED!)

- Nutrient density
- Diet Diversification (multiple benefits)
- Offer foods that are prepared in a safe, developmentally appropriate way
- Include top allergens in baby's diet
EARLY & OFTEN
- Avoid choking hazards as well as added sugars, foods higher in sodium, honey and unpasteurized foods and beverages
- Understand the difference between gagging and choking & educate yourself on what to do in the event of each



Bringing the Recommendations into Daily Life

- Balanced meals (2015 BLISS Study)
 - Iron-rich protein food
 - Fruit or vegetable rich in vitamin C (may help boost iron absorption)
 - Energy-rich food, preferably with healthy fats
- Portions:
 - Start small
 - Let baby lead



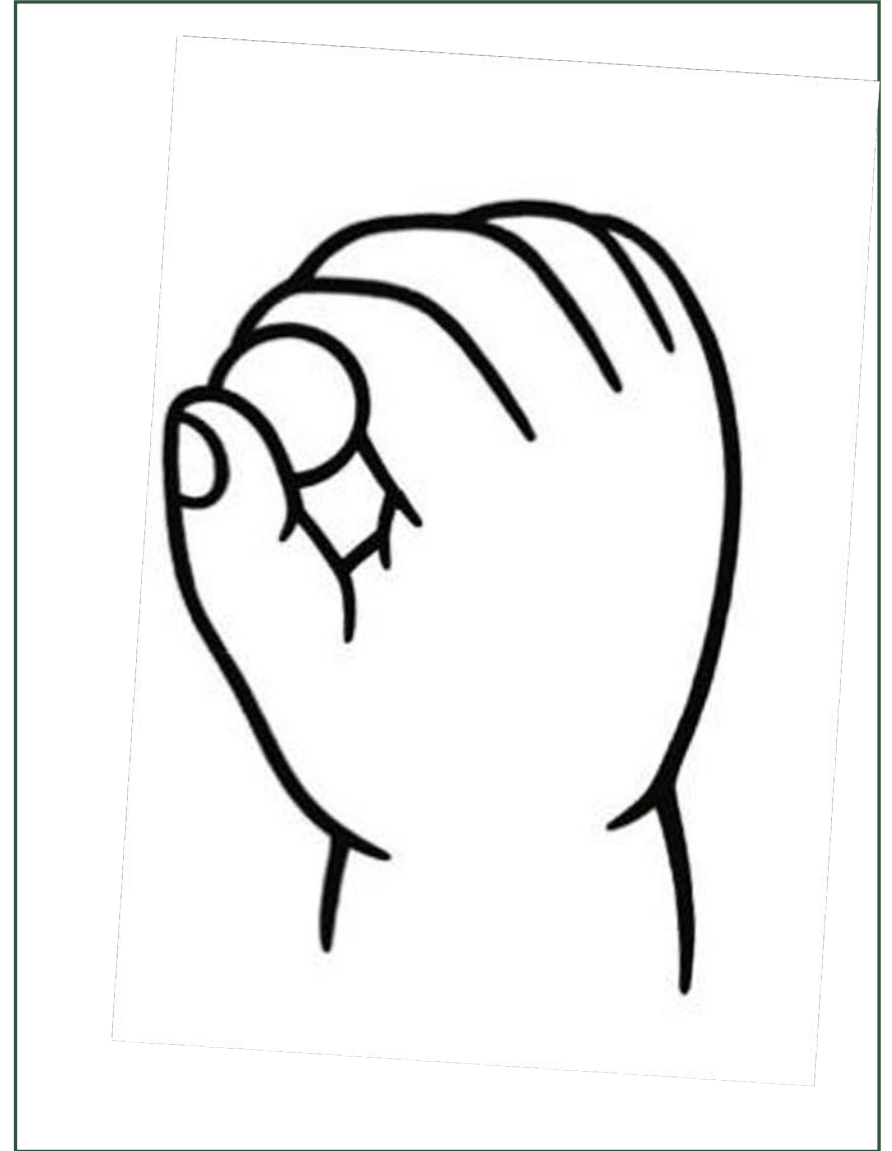
Texture & Sizing of Finger Foods: Palmar grasp

- Offer foods about the length & width of an adult pinkie finger
- Texture should be soft and should squish easily between thumb & forefinger



Texture & Sizing of Finger Foods: Pincer grasp

- Cut foods into small bites about the size of a Cheerio or chickpea
- Texture of offered foods should still be soft and easily squishable between thumb & forefinger



Top allergenic foods

- At first, offer 1 at a time & not as a part of a mixed dish
- If no reaction, offer again each day for a few days, then move on to the next top allergen
- How to start:
 - Tiny amount (~1/8th of a tsp)
 - In the morning when you can be fully attentive for at least 2 hours
 - Healthy baby
 - Good mood
 - Not too tired, hungry or full



FISH



COW'S MILK



SHELLFISH



SOY



TREE NUTS



PEANUTS



WHEAT



EGG



SESAME

Practical Ways to Introduce Eggs

- Nutrient-dense, recommended first food for babies
- Excellent or good source of 8 essential nutrients
- One of the most concentrated sources of brain-building choline
- BOTH whites and yolks should be introduced during infancy

(<https://pubmed.ncbi.nlm.nih.gov/27939035/>)



Strips of soft French toast



Hard boiled, quartered lengthwise



Added to pancake batter

Mix baked egg powder with a familiar puree



Soft strips of quiche, frittata or omelet



Scrambled in larger pieces baby can palm



Practical Ways to Introduce Peanuts

- Nutrient-dense, recommended early food for babies
- Early intro of peanut does not affect the duration of breastfeeding, nor does it negatively affect growth or nutrition
- Avoid whole peanuts and globs of peanut butter (choking hazards)
- Offer 2 grams peanut protein ~3x/week in an infant safe form (LEAP Study)

([https://www.jacionline.org/article/S0091-6749\(16\)30262-7/fulltext](https://www.jacionline.org/article/S0091-6749(16)30262-7/fulltext))



Practical Ways to Introduce Cow's Milk

Cow's Milk:

- COW'S MILK IS NOT RECOMMENDED AS A BEVERAGE BEFORE AGE 1
- BUT cow's milk can (and should) be offered in foods, baked goods & recipes

Yogurt

- Plain (to keep added sugars low) and full-fat are recommended

Cheese

- Avoid soft cheeses made with unpasteurized milk (goat, feta)
- Look for low-sodium cheeses that are soft in texture



Get Creative!

- Spreads and dips like peanut butter can help boost nutrition and include allergens
- Instead of offering a plain teething cracker, try adding a thin layer of
 - peanut butter
 - mascarpone cheese
 - crème fraiche
 - cream cheese



Practical Ways to Introduce Soy

- Tofu
- Tempeh (steamed & softened)
- Mashed edamame
- Use plain, unsweetened soy milk in oatmeal, pancake batter and other recipes (but do not serve as a beverage before age 1)
- Plain, unsweetened soy yogurt

PALMAR GRASP

Size of an adult pinkie
Longer than baby's palm



PINCER GRASP

Chickpea-sized bites
Soft, squishy texture



Practical Ways to Introduce Fish

- Many types are a great source of iron, protein & omega-3s
- Choose small prey fish which have lower mercury levels
- Always cook thoroughly (do not serve raw) and be sure to remove any bones
- If choosing canned, look for 'BPA-free' packaging and 'low salt,' or 'no salt added'

Cooked, flaky fish (i.e., Arctic char, cod)



Salmon patty cut into finger-sized strip



Canned salmon mixed w/ plain yogurt



Practical Ways to Introduce Shellfish

- Be mindful of sodium content (most shellfish are naturally high in many minerals including sodium)
- Texture of shellfish can be rubbery and tough which increases choking risk
- Cook thoroughly and puree, finely chop or shred shrimp, lobster, crab, clams, crawfish, etc. before adding to sauces, patties, fritters or casseroles

SHREDDED & ADDED
TO TOMATO SAUCE



CRABCAKE



SHRIMP FRITTER



Practical Ways to Introduce Tree Nuts

- Whole nuts and globs of nut butter are a choking hazard
- Spread a thin layer of nut butter on toast strips or teething crackers
- Add nut flours into muffins, pancakes
- Use ground nuts for extra grip on slippery fruits



Add ground nuts or nut flour to baby's pancake or muffin batter



Roll slippery wedges of fruit in ground nuts or nut flour



Mix ground nuts or nut flour into a familiar puree



Mix nut powder with breastmilk or formula & spread on a teething cracker

Practical Ways to Introduce Wheat

- Pancake
- Toast
- Waffles
- French toast
- Pasta
- Wheat germ or wheat bran
 - Mixed into purees
 - Used for extra grip on slippery fruit wedges



FUSILLI

Ridges & texture makes these shapes easier for little hands to grasp

Serving in a sauce makes pasta easier to swallow



SHELLS

Bonus - tomato sauce is high in vit C which improves iron absorption!



PENNE

Practical Ways to Introduce Sesame

- Tahini (ground sesame paste)
- Homemade hummus on toast strips or on a spoon (skip the salt)
- Blend tahini into soups



Blend tahini into soup or stew broth (like Lemon Lentil Tahini)



Layer some homemade hummus or baba ganoush on a toast finger



Homemade hummus or baba ganoush on a pre-loaded spoon



Thin layer of tahini (sesame paste) on a teething cracker

Convenience Products for Early Introduction

Peanut Purees (ready-to-feed)

- Happy Family Organics Nutty Blend
 - Available at Target, Amazon
- Square Baby
 - Available on the company's website
- MyPeanut
 - Available on Amazon and the company's website
- Inspired Start
 - Available on Amazon and the company's website



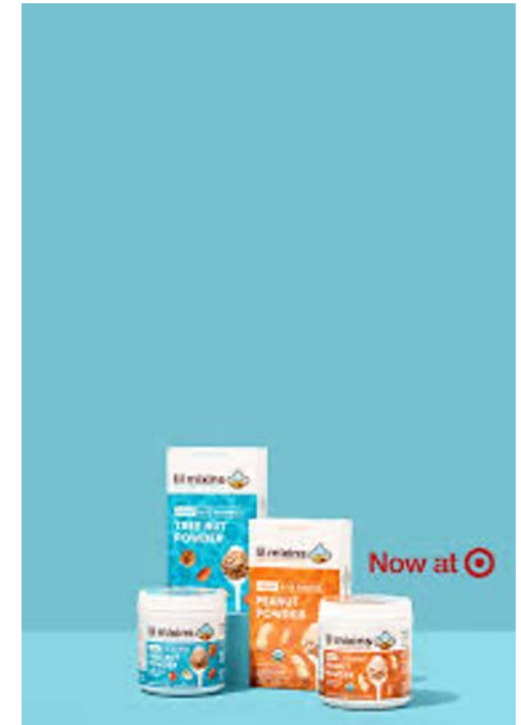
Peanut Puffs & Bars (supports self-feeding, convenient)

- Bamba
 - Amazon & retailers nationwide
- Mission MightyMe
 - Amazon & the company's website
- Gerber BabyPops
 - Safeway, Albertson stores & retailers nationwide
- Earth's Best Organic Puffs
 - Target, Amazon, Walmart
- Puffworks Baby
 - Amazon, Whole Foods, & the company's website
- Plum Organics Mighty Nut Bar
 - Target, Amazon, Walmart



Allergen Powders (offers a prescribed approach)

- Lil Mixins (available at Target, Amazon & the company's website)
- Ready, Set, Food (available on Amazon & the company's website)
- SpoonfulOne (available at Walmart, Amazon and the company's website)



Key Takeaways

- Feed babies confidently & joyfully!
- Feed responsively (whether using BLW, spoon-feeding, or both)
 - Consider the many important goals of feeding during infancy
- Keep it simple, safe & stress-free
 - Offer baby nutrient-dense, minimally processed foods (with minor adjustments in size, texture and ingredients such as sodium and sugar) from meals that can be served to the whole family
- Include top allergens early & often
 - Starting at ~6 months of age with signs of readiness
- Know that there are now many convenience products available to help make early intro of top allergens easier



Q & A

*Please type your questions
into the CHAT box.*

For additional questions and information

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National 
Peanut Board



A close-up photograph of a young Black baby sitting in a wooden high chair. The baby is wearing a white long-sleeved shirt with small red hearts and a pink bib. An adult's hand is holding a white bowl with a blue rim in front of the baby, and another hand is holding an orange spoon, feeding the baby. The baby has a small amount of food on their lips and is looking towards the camera with a curious expression. The background is softly blurred, showing a wooden chair and a person's arm.

THANK YOU!
