



Reintroduction of Food Allergens Following Negative Oral Food Challenges: A Pediatric Study

Wan Shen¹, Ahmed Z. Elisa^{2,3}, Avram Derrow^{2,3}, Jayden Parrott¹, Caitlyn Beldon¹

¹Department of Public and Allied Health, Bowling Green State University, Bowling Green, Ohio 43403; ²ProMedica Physicians Allergy and Immunology; ³Department of Pediatrics, University of Toledo College of Medicine and Life Sciences

Background & Rationale

1. Limited dietary exposure to targeted allergen-containing foods after negative oral food challenges (OFCs) may → allergy recurrency.

- Busse et al. 2002, NEJM: 7% (3/44) had allergic reaction with confirmed ↑IgE levels (PN).
- Fleischer et al. 2003, JACI: 3% (2/64) had suspected reactions (PN).
- Van Erp et al. 2014, PAI: 13% (13/103) had suspected reactions (PN).

2. Inconsistent re-introduction rates of targeted allergen-containing foods after negative OFCs.

- Busse et al. 2002, NEJM: 47% (10/21) “routinely” ate PN.
- Fleischer et al. 2003, JACI: 70% had PN most about once a month, 30% on a “somewhat” regular basis.
- Van Erp et al. 2014, PAI: 68% (70/103) reintroduced PN.
- Brooks et al. 2020, Ann Allergy Asthma Immunol: 89% (92/101) had at least weekly (varied foods).
- Cheah, et al. 2022, Ann Allergy Asthma Immunol: 83% (216/260) reintroduced PN or at least some TN.

3. Top reasons for NOT re-introduction:

- Weinberger et al. 2019, JACI: “refusal” (52%), “fear” (19%), “lack of knowledge” (8%).
- Ditlof et al. 2021, JACI (abstract): top barriers as “fear of a reaction” and “dislike the food”.
- Cheah et al. 2022, Ann Allergy Asthma Immunol: “child refusal” (51.1%), “difficulty into diet” (25.6%), & “fear”, “not advised” and “allergic reaction” (all 12.2%).

4. Highlighted Nutrition value of the top 9 allergens:

- Egg:** high-quality protein, unsaturated fats, choline, vit D, vit B2, vit B12.
- Cow's milk:** high-quality protein, short chain saturated fat, calcium, vit D (if fortified), vit B12, phosphorus, potassium
- Soy:** plant-based protein, polyunsaturated fats, magnesium, folate
- Wheat:** magnesium, selenium, B vitamins, fiber, gluten
- PN:** protein, mono- and poly-unsaturated fats, vit B3, vit E, fiber
- TN:** mono- and poly-unsaturated fats, vit E, magnesium, zinc, iron
- Fish/shellfish:** high-quality protein, omega-3 fatty acids, vit D, iodine, selenium
- Sesame:** mono- and polyunsaturated fats, magnesium, zinc, iron

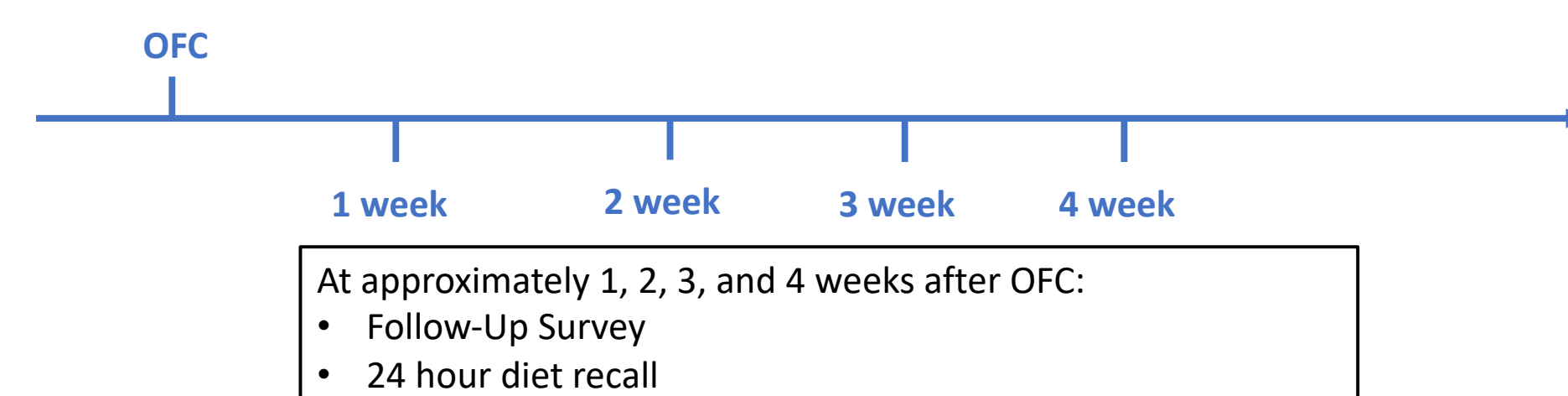
Research Question

1. What are the current practices and levels of confidence among parents and caregivers of children aged 0-6 years in reintroducing allergenic foods after negative oral food challenges (OFCs)?

2. How does diet quality among children aged 0-6 years change after negative oral food challenges (OFCs)?

Study Design

On the day of the oral food challenge (OFC) day:
• Baseline survey (Demographics, family history of allergies, breastfeeding, and general health, food introduction and food allergies of your child)
• 24 hour diet recall



Inclusion criteria:

- Healthy, aged between 0–6-year-old.
- Has a scheduled oral food challenge at ProMedica Allergy and Immunology clinic at Perrysburg office location.

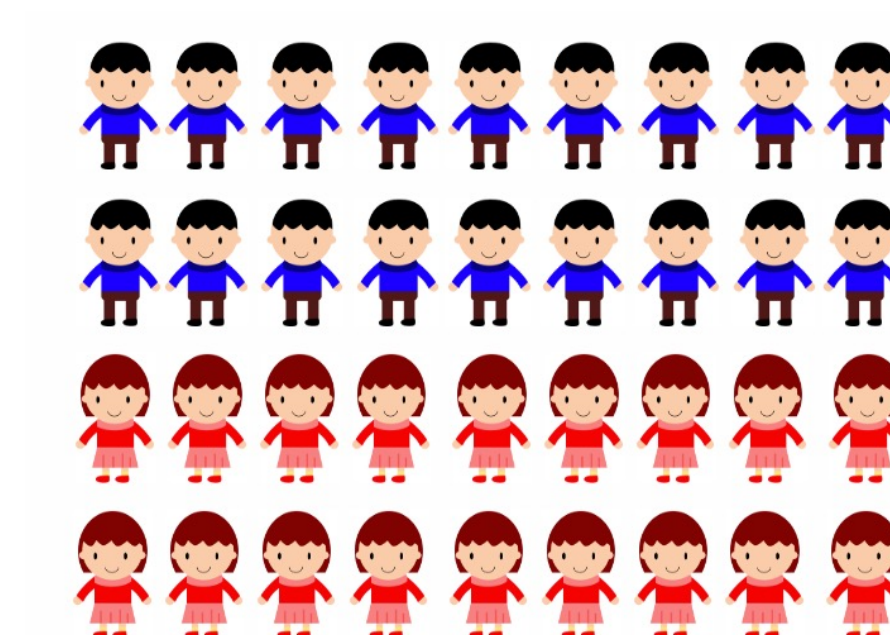
Follow up survey includes:

- OFC results
- Reintroduction frequency;
- Precaution Adoption Process Model questions (7 stages for behavior changes);
- Barriers and factors that may impact the reintroduction;

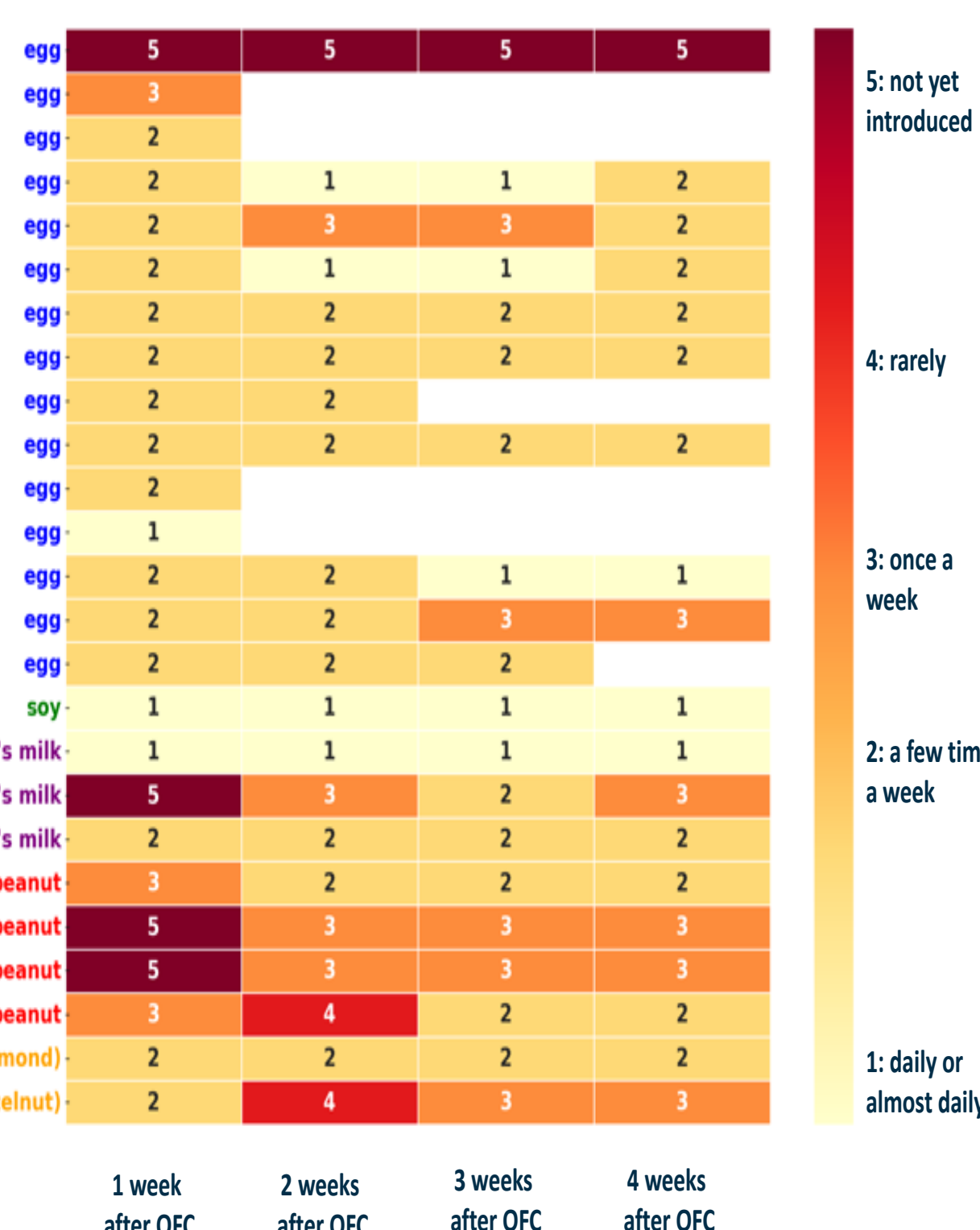
Exclusion criteria:

- Have any diagnosed autoimmune diseases, GI disorders, *FPiSE*, or *EOE*.
- Taking any medication (prescribed or over-the counter) on a regular basis for treating or managing a chronic medical condition.

Major Findings



Jan – Dec 2024
N=36, mean age: 3 years and 4 month



OFC failed: n=6
Mean age: 1 year and 8 month
Failed allergens: egg x 1, cow's milk x 2, peanut x 3; most kids (n=5) with eczema or atopic dermatitis, asthma or environmental allergies



OFC passed: n=25
Mean age: 4 year and 2 month
Passed allergen: egg x 15; cow's milk x 3, peanut x 4, soy x 1, almond x 1, hazelnut x 1; Majority of kids (n=18) with eczema, atopic dermatitis, asthma or environmental allergies

Figure 1. Heatmap of Reintroduction Frequency Trends over Weeks

Table 1. Reintroduction Frequency Trends

	1 week after OFC				2 weeks after OFC				3 weeks after OFC				4 weeks after OFC			
	Daily	Weekly	Rarely	Not yet	Daily	Weekly	Rarely	Not yet	Daily	Weekly	Rarely	Not yet	Daily	Weekly	Rarely	Not yet
Egg (n=15)	6.7%	86.7%	-	6.7%	18.2%	72.7%	-	9.1%	30.0%	60.0%	-	10.0%	11.1%	77.8%	-	11.1%
*Soy (n=1)	100.0%	-	-	-	100.0%	-	-	-	100.0%	-	-	-	100.0%	-	-	-
Cow's milk (n=3)	33.3%	33.3%	-	33.3%	33.3%	66.7%	-	-	33.3%	66.7%	-	-	33.3%	66.7%	-	-
PN (n=4)	-	50.0%	-	50.0%	-	75.0%	25.0%	-	-	100.0%	-	-	-	100.0%	-	-
TN (n=2)	-	100.0%	-	-	-	50.0%	50.0%	-	-	100.0%	-	-	-	100.0%	-	-
All (n=25)	12.0%	72.0%	-	16.0%	19.0%	66.7%	9.5%	4.8%	25.0%	70.0%	-	5.0%	15.8%	78.9%	-	5.3%

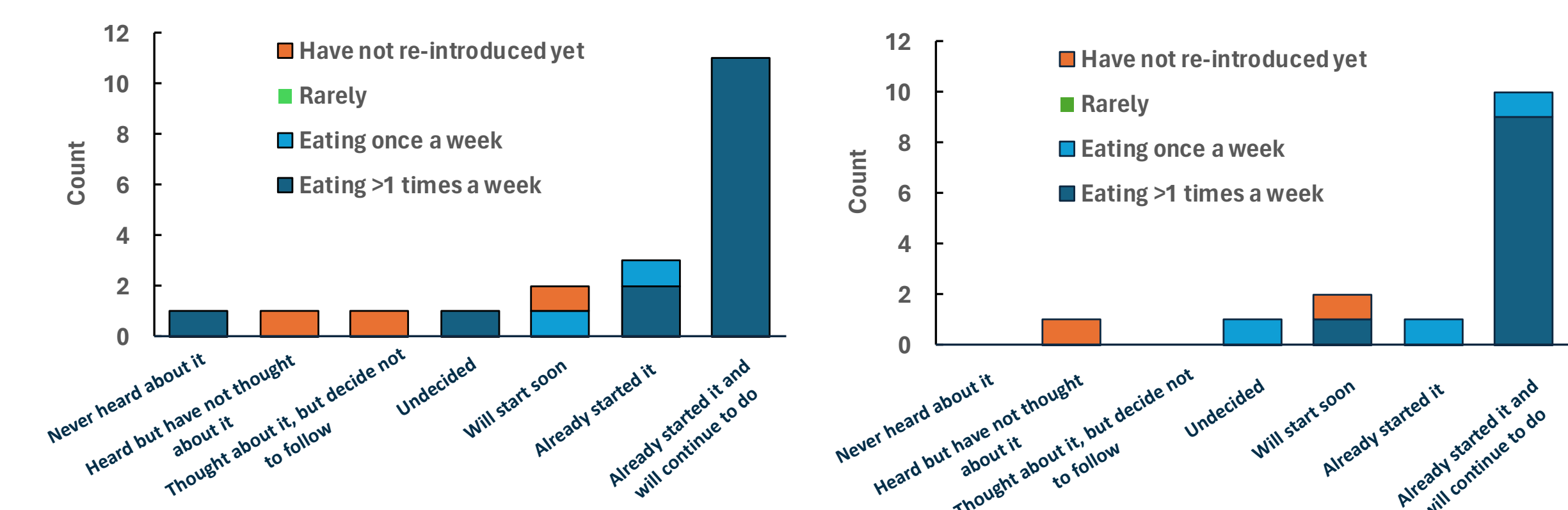
Major Findings

Table 2. Factors Influencing Reintroduction

	No. observed
1 I believe those foods will benefit my child.	9
2 I typically purchase those foods for my family.	6
3 My healthcare provider told me to feed those foods to my child.	12
4 Someone other than my healthcare provider told me to feed those foods to my child.	2
5 I like the taste and/or texture of those foods.	2
6 My child likes the taste and/or texture of those foods.	4
7 Those foods are commonly prepared in my religion and/or culture.	3
8 Other	1

Other: “I want my child to be able to safely participate in social activities, and most involve snacks/food that contain allergen.”

Figure 2. Reintroduction Frequency by Stages over Weeks



Conclusion & Discussion

- Majority of participants (84%) reintroduced the allergen within one week following negative OFCs. A small group (16%) did not reintroduce the allergen in the first week, but this number significantly dropped to 5% in the second week.
- Top 3 reasons for parents to reintroduction: healthcare providers’ direction, understanding/knowledge level, family dietary habits.
- The observed patterns of allergen reintroduction align with the stages of the Precaution Adoption Process Model in the process.
 - ✓ The pivotal role of medical professionals in guiding parents in reintroduction process.
 - ✓ Provide dietary guidance for families in reintroduction process: recipes, other cultural food introduction, financial?
 - ✓ Reinforce the importance of reintroduction and provide guidance, support and follow up.
 - ✓ Teamwork (+registered dietitian, social worker)

Funding Source