

Background

- Food allergies (FAs) affect over 5 million children in the United States.¹
- Prior studies show that adults have limited knowledge of food allergies, cross-contact, and allergen safety. Few studies exist that examine FA knowledge among U.S. youth.²
- Video-based training for primary and middle school students has been shown to be effective in raising awareness of food allergies and anaphylaxis in Türkiye.³
- The Culinary Medicine Initiative (CMI) is a Tulane University service organization that delivers hands-on cooking and STEM education led by undergraduate students.

Objective

To assess the efficacy of college student-led cooking and STEM education program on improving FA knowledge among middle school-aged youth.

CMI Class Structure

Location: Goldring Center for Culinary Medicine

Dates: 5 classes delivered between July 2025 and December 2025

Class recruitment: via social media

Class Structure

- 9:15am-9:30am – Check-in
- 9:30am-9:40am – Pre-Class Quiz
- 9:40am-10:30am – Educational Presentations
- 10:30-11:00am – DNA Extraction Activity
- 11:00-12:05pm – Cooking Lesson
- 12:10-12:20 – Post-Class Quiz
- 12:20-12:30 – Class Recap

Assessment Methodology

Participants: 100 middle school students (ages 10-13)

Method of Assessment: Pre-class and post-class quizzes were based on information in the middle school section of **Northwestern Center for Food Allergy and Asthma Research’s (CFAAR) Food Allergy Education Guide**

- 6-question multiple-choice quiz on food allergy knowledge
- Fill-in-the-blank section on the Top 9 allergens
- Self-reported confidence in recognizing and responding to allergic reactions (“skin confidence”)

Statistical Analysis: Paired t-tests were performed to compare pre- and post-class quiz scores.

Session Format

- Educational Component:** 45-minute educational lesson on key health topics, created and led by Tulane University students
 - Topics:** Digestive Anatomy, Exercise Physiology, Heart Health, Food Allergies

- Post-class quizzes were administered 2.5 hours after the pre-class quiz and 1.5 hours after CMI’s educational presentations.



Results

6-Question FA Multiple Choice Quiz	33.3% improvement, $p < 0.001$
Pre-Class Quiz	3.51 / 6 (58.5%)
Post-Class Quiz	4.68 / 6 (78.0%)
Top 9 Allergen Naming Quiz	265% improvement, $p < 0.0001$
Pre-Class Quiz	1.42 / 9 (15.8%)
Post-Class Quiz	5.19 / 9 (57.7%)
Skin Confidence Survey	11.0% improvement, $p < 0.004$
Pre-Class Survey	3.54 / 5 (70.8%)
Post-Class Survey	3.93 / 5 (78.6%)

Discussion

Significant improvement in Top 9 allergen identification ($1.42 \rightarrow 5.19$, $+3.78$, $p = 5.88 \times 10^{-21}$) highlights the efficacy of the college-student-led class combining interactive teaching with a hands-on cooking lesson to build practical allergy awareness among youth.

Class Feedback

Students rated the session using a scale from 1 (Strongly Agree) to 5 (Strongly Disagree).

Average scores were as follows:

- My knowledge of science improved: 1.65
- My knowledge of cooking improved: 1.53
- I had fun today: 1.41
- I would participate in future classes: 1.12

Feedback from the class was highly positive.

Conclusion

This community-based, cooking and STEM-focused experiential learning model aimed at improving food allergy knowledge among youth

- supports integration of food allergy education into youth programming
- demonstrates the value of near-peer, college student-led health education
- highlights cooking as an effective vehicle for STEM and health learning

Continued evaluation will assess sustained impact and scalability of this student-led culinary medicine and STEM education model in community settings.

References

1. Gupta RS, Warren CM, Smith BM, et al. The Public Health Impact of Parent-Reported Childhood Food Allergies in the United States [published correction appears in *Pediatrics*. 2019 Mar;143(3):e20183835. doi: 10.1542/peds.2018-3835.]. *Pediatrics*. 2018;142(6):e20181235. doi:10.1542/peds.2018-1235

2. Aytulu T, Gundogdu BS, Yayci E, et al. The evaluation of food allergy knowledge and attitude in different food sectors and the effectiveness of video-based training. *Front Nutr*. 2025;12:1512845. Published 2025 Feb 17. doi:10.3389/fnut.2025.1512845

3. Yuksel Bulut H, Demirkesen Bicak H. Video-based food allergy and anaphylaxis training for primary and middle school students. *Pediatr Allergy Immunol*. 2026;37:e70363. doi:10.1111/pai.70363