# Improving Youth Understanding of Allergies Through a Cooking and STEM Education Program: A Pilot Study

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## Background

- Food allergies (FAs) affect approximately 7.6% of U.S. children, totaling over 5 million nationally.[1]
- Studies show adults lack adequate understanding of FAs, cross-contact, and allergen safety. Limited studies exist that evaluate children's understanding of FAs.[2]
- The Culinary Medicine Initiative (CMI), a Tulane University service organization, provides cooking and STEM education programming led by college students.
  - CMI classes have reached 200+ local New Orleans youth to date.

## Objective

To assess the efficacy of a combined STEM and cooking class on improving allergy knowledge among middle school-aged participants.

## CMI Class Structure

**Location:** Goldring Center for Culinary Medicine
**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:** 20 middle school students (ages 10-13)
**Method of Assessment**: Pre-class and post-class quizzes were based off 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 question on the Top 9 allergens

**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 undergraduate students
  - Topics: Brain Foods, Oral Health, Vision, Microbiome, Heart, Allergy and Immunology
- **Cooking Activity:** 1.5-hour burrito bowl preparation
- **Assessment Timing:** Post-class quiz administered 2.5 hours after pre-class quiz, and 1.75 hours after the allergy presentation

## Results

**Top 9 Allergen Naming**
- Pre-Class Quiz: 1.71 ± 1.93
- Post-Class Quiz: 4.76 ± 2.49
  - p-value = 0.0004
    - 178.36% score increase

**6-Question Multiple Choice Quiz**
- Pre-Class Quiz: 5.176 ± 0.64
- Post-Class Quiz: 5.235 ± 0.83
  - p-value = 0.7731

## Discussion

Significant improvement in Top 9 allergen identification (1.71 → 4.76, p=0.0004) highlights the efficacy of the class and 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.

## Future Directions

This model of health education can be adapted to cover a broader range of STEM and nutrition topics. CMI is planning a summer camp and additional programming focused on assessing and enhancing youth knowledge of chronic disease prevention, including conditions such as diabetes, cardiovascular disease, and cancer.

### 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