

RESEARCH

**Educating Childcare Providers to Prepare and Serve Safe Food for Young Children**

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## Abstract

Michigan State University Extension's Safe Food=Healthy Kids curriculum is a comprehensive three-hour food safety education program for childcare providers intended to reduce foodborne illness in young children. In Michigan there are no requirements for food safety training for childcare providers, yet this workforce prepares food for an at-risk and vulnerable population. Post-class program evaluations (n=1,906) and follow-up surveys (n=149) show evidence that education to childcare providers increases their food safety knowledge and behaviors (i.e., thermometer use, cleaning/sanitizing, time and temperature control); thus, providing safer food for children. The program is available to implement virtually or in-person and as a train-the-trainer.

## Educating Childcare Providers to Prepare and Serve Safe Food for Young Children

Foodborne illness reaches all segments of the population, but children are disproportionately affected (Reynolds, 2016). Not only do children under the age of five account for 30% of all foodborne illness related deaths (WHO, 2015), but children in childcare facilities have reported acute infectious diarrhea two to three times than of children cared for in their own homes (Collins et al., 2018). Lack of food safety training for childcare providers and lack of adherence to effective diapering and hand hygiene practices as well as improper use of food preparation equipment may result in poor quality control for factors that affect food safety (Enke et al., 2006). Childcare providers furnish the bulk of children's nutrient intake, yet, according to the National Database of Child Care Licensing Regulations (2017), only 20 states require providers to have Health and Safety Training. The need for food safety education for childcare providers is critical to prevent food-

borne illness in children.

The Centers for Disease Control and Prevention (CDC) estimates 48 million Americans become ill with foodborne illness every year, and up to 3000 of these cases will result in death (CDC, 2018). Based on data from the Michigan Department of Education, there are approximately 10,000 childcare provider homes and centers throughout Michigan, providing more than 42 million breakfasts, lunches, and snacks annually (CACFP, 2020). In Michigan, there are no requirements for food safety training for childcare providers, making community-based options for education necessary. By educating childcare providers they can improve their knowledge and skills and have the potential to be a trusted source for food safety practices through their interactions with families and caregivers, thus decreasing the overall foodborne illness risk for children.

## Purpose

Safe Food = Healthy Kids (SFHK) is a food safety education program created to educate childcare providers on food safety best practices thus minimizing the incidence of foodborne illness in young children and their accompanying health disparities. The purpose of this paper is to share the development, delivery, and evaluation of this novel food safety education program focused on childcare providers. Michigan State University (MSU) Extension Educators identified that existing food safety curriculums did not meet the need to educate childcare providers who are caring for a high-risk population. The positive impact on providers' food safety practices as captured in the program evaluations, and the opportunity for this program to be implemented in other states is highlighted.

## Method

### Program Development

SFHK was created and implemented in 2017, with funding for program development and pilot testing from the Michigan

Health Endowment Fund grant. Grant funds supported the work of four Educators to develop the curriculum, marketing materials, resources, and participant incentives. The pilot programming began in six Michigan counties, consisting of both rural and urban audiences. Pilot SFHK class locations included community settings, childcare centers, and Extension offices. Classes were offered in the evening to accommodate childcare provider's demanding daytime schedules. The delivery method was designed for in-person programming. Grant funds were used to procure incentives including branded insulated grocery bags, refrigerator/freezer and food thermometers, laminated index resource cards and a printed packet of food safety resources.

The need for curriculum revisions was identified following the initial 12-month pilot phase. Participant feedback led to further modifications of the curriculum presentation and supplemental pieces to enhance the program including more in-depth information on pathogens and thermometer use. Also added was a lesson on High Speed Handwashing, a resource from Oregon State Extension (2020); an expanded sanitizing lesson; and the development of a Safe Sanitizing and Disinfecting fact sheet.

SFHK program outcomes are self-reported and collected through a post-class evaluation measuring both participant's behavior change and food safety knowledge gained. The evaluation process received IRB approval from the university research office. Participation in the survey for program evaluation purposes was completely voluntary. The survey was designed to gather information illustrating what participants learned regarding current safe food handling practices and what they plan to implement after the program. The survey has six questions in which participants self-report what amount of new information they learned from the program in the areas of both food safety knowledge and behavior change. The survey uses a Likert Scale allowing participants to report what amount of new knowledge was learned following program completion (no new knowledge, some new knowledge, a moderate amount, and a great deal). Questions measured plans to implement food safety behaviors to improve food safety practices. Participants indicated which food safety practices they "planned to do" because of the course and those that "plan to do more often". If participants reported learning either "some," "a moderate amount," or "a great deal," they were combined into one group to create a percentage of participants who improved their knowledge.

Likewise, those who "planned to do" or "do more often" were combined into one group for a percentage of participants that will engage in food safety behaviors more often because of the course. The survey also has an open-ended question allowing participants to provide further anecdotal feedback and comments. The same evaluation questions were collected for in-person and virtual programs, using paper and electronic options depending on the class delivery format. Online surveys were collected using a QR code or direct link to a Qualtrics survey; surveys collected on paper were manually entered into Qualtrics. Spreadsheets were exported from Qualtrics for data analysis in Excel and Statistical Package for Social Sciences (SPSS).

Additionally, a follow-up evaluation was also conducted with participants who had completed the class in the previous three to nine months. The protocol for this follow-up survey involved electronic distribution of the survey link to a sample of past participants using Qualtrics. Participant consent was received as part of the Qualtrics survey. Before being directed to the survey questions, participants had the opportunity to opt out, or if they agreed, move forward with survey completion. Upon completion, participants were directed to a separate Qualtrics survey to collect their name and email address for a \$10 gift card incentive distribution. This process kept identifiable information separate from survey responses used in the present study.

## Program Delivery

SFHK is a three-hour educational program with a PowerPoint presentation and a facilitator's guide with prompts for activities to engage audience and follow-up resources and handouts. The program objectives for class participants are to:

- Learn the sources of foodborne illness and why children are considered high risk
- Understand the basic principles of safe food handling
- Identify incorrect food handling practices
- Determine proper sanitizing procedures
- Recognize reputable food safety resources

The format was adapted in 2020 to include either a single session or two, one and a half hour sessions. The coronavirus pandemic halted in-person classes resulting in the transformation of the program to an online version with an interactive format, utilizing polls and discussion questions. Accommodations for program participants are made upon request including closed captioning and resources for visual learners. Educational resources are sent in a follow-up email after program completion. Participants can sign up for a supplemental, optional, weekly texting program which sends food safety text messages with links and/or videos to subscribers.

## Marketing

Multiple marketing avenues were used for SFHK program promotion. Within MSU Extension, weekly informational emails with upcoming programs and events were sent to 83 county offices. Materials were created to share with local and statewide community partners and included: postcards for childcare providers and MSU Extension staff, class flyers, and social media graphics. All marketing print materials and online graphics were designed with MSU Extension branding and logo used to maintain the program's identity (Figure 1). The MSU Extension Safe Food = Healthy Kids program maintains a web page which features resources, articles, and upcoming classes. Great Start to Quality (GSQ) is a statewide rating and quality improvement organization used to promote statewide professional development opportunities, track attendance, and record training hours for childcare providers. Because the GSQ online platform is a mandatory tool, it effectively led to the majority of participant recruitment.

SFHK was highlighted at the 2021 National Extension Association of Family and Consumer Sciences (NEAFCS) Annual Conference during a concurrent, ignite, and poster session for marketing and recruitment. Further exposure was gained as SFHK received multiple NEAFCS awards: national award winner in 2020 for the Food Safety Award; five-time regional award winner; and six-time state award winner.

## Results

Since the program's inception in 2017, 1,999 childcare providers participated in 80 SFHK training sessions. During the pilot period, demographic data revealed the average age of participants was 41 years; 98% were women; 75% were White, 19% Black and 5% Hispanic; and 34% were a high school graduate, 29% had some college, and 34% had a college degree or vocational training.

Following the pilot phase, work has been done to expand participant diversity. Self-reported data shows the diversity of participants in 2020-21 included 52% Caucasian, 25% Black/African American, 4% Asian and 1% American Indian, as compared to 2017-19 with a mostly Caucasian audience of 96%. This increase was due to the transition to online programming which created opportunities to reach a larger and more diverse audience throughout the state. Participants spanned from over 84% of Michigan counties and resulted in an increase in ethnic diversity by 33%. The frequency of programming and participation also increased with virtual delivery. For example, 11 sessions were delivered in 2019 with 124 participants, compared to 20 sessions in 2020 reaching 958 participants (673% increase).

Post-class evaluation data from the past five years of both in-person and virtual programming indicates improved food safety knowledge and practices of childcare providers who participated in SFHK. From 2017 to 2021, 1,906 participants completed the post-class evaluation survey. Data show increases in the following participant behaviors (Table 1):

- 71% plan to check food temperature with a calibrated food thermometer
- 46% plan to cook foods to proper temperature
- 61% plan to limit the time food spends in the temperature danger zone
- 68% plan to cool foods quickly

Respondents also gained new knowledge in the following areas: Personal Hygiene, 55%; Controlling Time & Temperature, 84%; Cross Contamination, 72%; Cleaning & Sanitizing, 67%; and Foodborne Pathogens, 83% (Table 2).

The total number of children served meals and/or snacks by class participants since 2017 was more than 45,700. This demonstrates the substantial reach childcare providers have when preparing and serving food to the children they care for. Educating childcare providers with best practices for food safety can greatly influence their food preparation and service behaviors when feeding children.

Participant feedback for SFHK has been overwhelmingly positive as providers shared, they learned a variety of information to benefit them in both their childcare career as well as personal lives. In the area of time and temperature control, participants noted how to use thermometers, proper cooling methods of food, how to check food temperatures, the minimum internal cooking temperature and understanding the temperature danger zone. In the area of cleaning and sanitizing, providers stated they learned the difference between cleaning and sanitizing information about the strength of different brands of bleach and proper mixing of sanitizer solutions. One provider indicated that "SFHK should be mandatory for everyone, like cardiopulmonary resuscitation training."

A follow-up survey was completed to capture additional data from 149 participants who participated in the program in the three to nine months prior. Participants indicated they have started or increased the following food safety practices: checking food temperature with a calibrated food thermometer, 47%; cooking foods to proper temperature, 29%; limiting time food spends in the temperature danger zone, 52%; and cooling foods quickly, 60% (Table 3).

The follow-up evaluation results also illustrated that since the conclusion of the program, 22% of participants shared handwashing educational information with staff; 58% implemented High Speed Handwashing with children. Additional responses highlighted food safety practices providers have implemented, including wearing gloves to handle prepared food, using a new digital thermometer, labeling and dating each container, cooking to proper temperature, defrosting foods the right way, using correct sanitizer and cooling foods properly before refrigerating. These all reflect the food safety practices that the SFHK educational program intended to instill.

## Summary

The need for food safety education in childcare providers is great, yet a lack of standards exists (National Database of Child Care Licensing Regulations, 2017). By strengthening knowledge and behaviors through education, childcare providers can improve their food handling practices and reduce the risk of foodborne illness in one of the most at-risk groups (Enke et al., 2006). The commitment by providers to ensure attention is given to implementing food safe behaviors is critical, as is consideration to encourage families to comply to these standards as well (Alamansour et al., 2011). SFHK participants have provided overwhelming positive response to the SFHK program, evidenced by post class evaluations and follow-up data. (Tables 1, 2, 3) Demonstrated impact in the areas of thermometer use, cleaning and sanitizing, and time and temperature control, showcase how education leads to improvements in knowledge and practices.

Looking at the SFHK program success in Michigan, there is value to offering this program nationally, considering the need for food safety education of all providers to minimize health implications that foodborne illness can have on children. Future opportunities include documenting similar results in other states that adopt use of the curriculum. There is potential for the development of more advanced program evaluation designs that can test program implementation to be used for continued quality improvement and/or updating the curriculum and establishing more generalizable outcomes. The SFHK curriculum received copyright in 2020 and is a standardized set of educational materials. The curriculum is available at no cost to Extension Educators in other states using the Desire to Learn platform to become trained as an instructor. Food Safety Extension Educators can access the curriculum by visiting MSU Extension's SFHK webpage (Figure 1).

Virtual delivery of the SFHK program resulted in new reach to more diverse participants compared to in-person SFHK classes only, which was a similar finding when food safety educators provided the Cottage Food Law program as an online program (Waitrovich et al., 2018). Virtual delivery shows great promise in reaching more diverse participants and presents opportunities for research on the program's effectiveness in delivery and with subpopulations or special audiences.

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## Appendix

### Table 1

*Food Safety Practices Reported in Post Class Evaluation Results*

Food safety practice	Did before	Plan to do	Probably won't do
Check food temperature with a calibrated food thermometer	26.87% (500)	70.55% (1,313)	2.58% (48)
Cook foods to proper temperature	51.85% (953)	47.17% (867)	0.98% (18)
Wash hands for 20 seconds	82.00% (1,512)	17.79% (328)	0.22% (4)
Limit the time food spends in the temperature danger zone	41.28% (762)	57.96% (1,070)	0.76% (14)
Cool foods quickly (to 70°F in 2 hours and to 40°F in 4 hours)	29.55% (547)	68.34% (1,265)	2.11% (39)
Separate raw and ready-to-eat foods during preparation, storage and serving	68.66% (1,266)	30.53% (563)	0.81% (15)
Use appropriate strength sanitizer on utensils, equipment & food contact surfaces	59.60% (1,102)	39.37% (728)	1.03% (19)

Note. N=1,906 respondents to the post class evaluation survey. Percentages show agreement with the statements. Numbers in parentheses indicate the number of survey responses.

## Table 2

### *Knowledge Gained by Childcare Providers as a Result of Program Attendance*

<b>Food safety knowledge</b>	<b>Percent gaining new information</b>
Personal Hygiene	55% (1,032)
Controlling Time & Temperature	84% (1,543)
Cross Contamination	72% (1,330)
Cleaning & Sanitizing	67% (1,234)
Foodborne Pathogens	83% (1,527)

Note. N=1,906 respondents to the post class evaluation survey. Percentages show agreement with the statements. Numbers in parentheses indicate the number of survey responses.



## Table 3


### *Identified Food Safety Practices Implemented Three to Nine Months Following Program Attendance*

Food safety practice	Did before	Have started or increased doing	Have not done
Check food temperature with a calibrated food thermometer	40.87% (47)	46.95% (54)	12.17% (14)
Cook foods to proper temperature	65.45% (72)	29.09% (32)	5.45% (6)
Wash hands for 20 seconds	77.70% (108)	22.31% (31)	0.00% (0)
Limit the time food spends in the temperature danger zone	46.83% (59)	51.59% (65)	1.59% (2)
Cool foods quickly (to 70°F in 2 hours and to 40°F in 4 hours)	31.53% (35)	60.37% (67)	8.11% (9)
Separate raw and ready-to-eat foods during preparation, storage and serving	70.09% (82)	28.20% (33)	1.71% (2)
Use appropriate strength sanitizer on utensils, equipment & food contact surfaces	71.21% (94)	26.52% (35)	2.27% (3)

Note. N=149 respondents to the follow-up survey. Percentages show agreement with the statements on food safety practices. Numbers in parentheses indicate the number of survey responses.

## Figure 1

### Safe Food=Healthy Kids Promotional Postcard for Train-the-Trainer D2L Course



**Safe Food = Healthy Kids**

A food safety curriculum to educate childcare providers

MICHIGAN STATE UNIVERSITY | Extension

**Safe Food = Healthy Kids**

This free curriculum is available for Extension educators to educate childcare providers on food safety best practices. Topics include cooking and storing food, personal hygiene, common allergens, and cleaning and sanitizing. Materials provided consist of a downloadable PowerPoint presentation, Instructors Playbook, and supporting educational resources.

To access this curriculum, please visit [extension.msu.edu/sfhk](https://extension.msu.edu/sfhk)

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