

Executive Summary

Educating and training food workers provides a foundation for safe food handling. In British Columbia, a legislated food handler training requirement was established in 2000. Operators of food service establishments, and at least one worker in every food service establishment (when the operator is away) must hold a certificate demonstrating successful completion of a food safety training course. This requirement consists of passing a food safety training program called "FOODSAFE®" or its equivalent. How long food workers retain food safety knowledge after FOODSAFE training and certification is not known. We examined if there was a decline in the ability of food workers to recall food safety knowledge after successfully taking FOODSAFE. We also examined the effects of workplace establishment, workplace duties (supervisory and non supervisory), age, experience and other influences on worker food safety knowledge and attitudes for FOODSAFE trained and untrained workers.

Trained FOODSAFE (test, n=499) and untrained (control, n=199) food workers participated in a survey in February 2009 to measure food safety knowledge, attitudes and practices at work and at home. Trained FOODSAFE participants who no longer worked in the food services industry were also surveyed and asked about home knowledge, practices and attitudes (n=393). Knowledge, attitude and practice results of trained and untrained food workers were scored, tallied and compared using t-test, means comparisons, and ANOVA. Regression was used to test the relationship between knowledge scores of trained workers and the time since their training was taken. Possible explanatory factors such as age, sex, years of experience working in the food industry, type of food premise, other food safety training taken, education level, ethnic background and position (supervisor or staff) were also compared for trained and untrained groups.

We found that during the last 15 years (from 1995 to 2009) knowledge scores of trained food workers decreased significantly over time after taking the FOODSAFE course ($p = 0.02$). The average scores of FOODSAFE trained participants one year after training was 70%, which is the passing mark for FOODSAFE. After one year, scores decreased gradually. The median score for all trained participants was 69%, and scores ranged from 19 – 100%. Knowledge scores ($p < 0.0001$), hand-washing practices ($p=0.03$), home practices ($p<0.0001$) and attitude scores ($p = 0.0006$) of trained food workers were statistically significantly higher than those of untrained food workers. This demonstrates that trained FOODSAFE workers better understand and practice principles of food safety in comparison to untrained food service workers who have not had FOODSAFE or other food safety education programs. Unfortunately, in both groups, approximately 60% stated they had never received any additional food safety training at work or school (aside from those who had taken FOODSAFE).

There were also statistically significant differences found in the food safety knowledge of food service workers (trained and untrained groups) based on position, education level, ethnic background, and in the categories of food premises where food service workers worked. Significant results were observed for greater knowledge of food safety principles in supervisors over staff, in college and university trained graduates over workers with high school education, in workers of British, North American, Eastern and Western European ethnicity over South and East Asian workers, and lower scores found in workers employed at fast food and retail stores.

Comparison of survey data on home based knowledge, practice and attitudes for trained FOODSAFE participants, untrained participants, and from data shared by Vancouver Coastal and Fraser Health authorities from a general population survey were also examined. Overall persons with a history of food

handler food safety training were more knowledgeable about home food safety practices than those persons surveyed in the general population. Untrained food service workers (those without food safety training) also scored higher than persons in the general population on home food safety practices, demonstrating that workplace exposure improves home food safety knowledge and practices.

This research supports the positive influence FOODSAFE training has on workers in the industry. Trained FOODSAFE workers are more knowledgeable about food safety principles than untrained workers in industry. However, knowledge retention in trained workers is an issue. Trained FOODSAFE workers, although more knowledgeable than untrained food service workers and the general population, do not retain this knowledge over the long-term. Of additional concern, more than half of the respondents to this survey did not receive food safety training nor reinforcement at their workplace. For these reasons, refresher training for previously trained workers is recommended. Based on the evidence gathered in this study, we recommend re-training take place every 3 years, and no later than 5 years from the first FOODSAFE or equivalent food safety training course for food service workers. As FOODSAFE training improves basic food safety knowledge for all categories of food workers, we also recommend that all food industry workers (such as those working in manufacturing and processing of foods) take FOODSAFE or equivalent training, even though there is no legislative requirement for these workers to take such training. Further, since (FOODSAFE) training also improves practices and food safety knowledge in the home, this study demonstrates the benefits and recommends food safety training for the general public.

Recommendations

Based on the survey findings, it is clear that food safety training (FOODSAFE) slowly declines over time. Of concern, although the decline is gradual, much of the knowledge is lost within a few months to a year after the initial training, as evidenced by average scores of 70%, the minimum score for a passing grade on the FOODSAFE exam, from persons taking the phone survey one year after their FOODSAFE training. FOODSAFE certificates should have an expiry date, and periodic retraining should be implemented for food workers of food service establishment to ensure they do not forget important principles of food safety. The data would suggest that refresher retraining be taken before 5 years has elapsed from the date of initial certification.

Food safety training does confer a better understanding of food safety principles in the workplace and at home, as demonstrated by the better knowledge, practice and attitude scores of FOODSAFE trained persons when compared to untrained persons, both at work and at home. We also recommend that all food workers take FOODSAFE or an equivalent food safety course, and that members of the general public are encouraged to take FOODSAFE or an equivalent food safety course to improve food safety knowledge and practices at home.

Specific recommendations based on this research are:

1. Holders of all existing FOODSAFE certificates who received training 3 or more years ago take a refresher FOODSAFE course.
2. FOODSAFE certificates should be issued with a date of certification and an expiry date.
3. All food workers in food service establishments should take FOODSAFE or an equivalent food safety training program.

4. Legislation should be revised to include FOODSAFE or equivalent training for food workers at other premises not currently covered under the Food Premises Regulation. These would include processing plants such as bakeries, meat and fish plants, and other premises making ready-to-eat products.
5. There should be a higher priority placed on training of staff, in addition to supervisors.
6. The food industry should place a higher priority on “on-the job training”.
7. Resources for training should be prioritized to establishments with higher risk and lower knowledge scores. These include take-out/fast food, food processors/manufacturers, and retail food stores.
8. Linguistically and culturally-sensitive training materials for certain ethnic groups, (South Asian and East Asian) need to be developed to help improve food-safety knowledge of these food workers. Although FOODSAFE curricula already includes these ethnic translations (Mandarin, Cantonese and Punjabi) further efforts may be necessary to convey food safety messaging to these groups within their place of employment.
9. As the benefits of food safety training include better home food safety practices, strategies for delivering food safety training to the general public should be encouraged.
10. Food safety educators should include explanations of how to read thermometers during food safety campaigns that promote thermometer use.

Additional recommendations include:

11. Industry and government should promote and implement on-the-job food-safety training to reinforce food safety principles learned during FOODSAFE.
12. Effective food worker training should include motivational strategies, such as management support, use of co-worker peer-pressure, and appropriate communication intervention tools (e.g., food safety infosheets).
13. Further research, including observational studies, is needed to assess behaviors and practices at the workplace. This research should also explore how to effectively translate worker food-safety knowledge into safe food-handling.