Water Quality, Pesticide Residue, and Food Safety Training

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Overview: The purpose of this training was to bring awareness to the quality of the water that is used for drinking and irrigation in Afghanistan. In addition, the use of pesticides in agriculture was addressed to bring awareness of how overuse and overexposure can significantly impact overall health. The lecture portion of the training introduced these topics and covered the importance of water quality and reducing pesticide residues on fresh fruits and vegetables. There was also a laboratory portion to the training where participants could test water samples that they brought in for overall water quality. In addition, the participants were able to test fresh fruits and vegetables that they brought in for the presence of pesticide residues and heavy metals.

Workshop Objectives: The main objective of this workshop was to bring awareness to the participants regarding the importance of water quality and the potentially detrimental health issues that can arise from overexposure to pesticide residues. The participants also were able to test water and fresh fruits and vegetables for themselves for overall water quality and pesticide/heavy metal residue. This allowed them to see first hand the quality of water that was being used for drinking and irrigation purposes, as well as the pesticides and heavy metals that were on their fresh fruits and vegetables that they were consuming.

The overall objective with the industry food safety training at Morvarid was to stress the importance of cross contamination and proper food handling. This is important to the industry as some of the products that are packed at Morvarid will not be cooked and likely consumed directly from the package (e.g. raisins and pistachios). Proper food handling also includes proper hand washing and hygiene, so a lab was designed to show the participants the importance of using hot water and soap for hand washing. The participants were each given a food safety kit that included Glo-Germ and a UV light so they could teach others the importance of proper hand washing.
washing techniques and Morvarid could use these materials to teach new employees the importance of hand washing.

**Workshop Activities:** For the water quality and pesticide residue training, the participants each brought in a fresh produce and water sample that was representative of the fruits, vegetables, and water that they would typically consume. The participants then tested for the presence of residual pesticides and heavy metals (such as arsenic, cadmium, copper, lead, malathion, mercury, zinc, and others) on their fruits and vegetables. In addition, the participants were able to test their water samples for the presence of *E. coli*, lead, pesticides (atrazine/simazine), total nitrate, total chlorine, pH, and total hardness. The participants were then given what the optimum or allowable limits were in the U.S. for each of the parameters tested so they could determine how their water would compare to U.S. drinking water standards.

For the industry food safety training at Morvarid, the participants were introduced to the basic concepts of food safety, how cross contamination of foods can occur, and how to prevent cross contamination from happening. The importance of hand washing and how to properly wash hands was also discussed with the participants. The participants were then separated into 3 groups and Glo-Germ lotion was placed onto their hand. Glow-Germ fluoresces under UV light and is used to mimic bacteria that are present on the surface of their hands. One group washed their hands with cold water only, another group with hot water only, and the third group with hot water and soap. A UV light was then used to determine that the group who used hot water and soap had the least amount of Glo-Germ remaining on their hands. This demonstrated that hot water and soap is the best method to properly wash hands before starting work or switching activities while working.

*Participants from the industry food safety training at Morvarid look for residual Glo-Germ on their hands using a UV light.*
Workshop Outcomes: The participants who participated in the water quality and pesticide residue training in Kabul and Herat learned 1) the health concerns for pesticides and water quality and 2) how to test for them so they could see the quality of their water that is used for drinking and irrigation purposes, as well as the potential of pesticide residues to be present on the fresh fruits and vegetables they consume. The training also taught them some actions that can be done at the home to help remove residual pesticides from fresh fruits and vegetables before consumption. In addition, the participant learned about the physical symptoms to be aware of due to overexposure to pesticides so they could help inform others who are experiencing those symptoms that action is needed to prevent serious illness. Participants also shared stories of pesticide exposure and poor drinking/irrigation water. After lecture, the participants conducted lab work using rapid tests to measure pesticide and water quality.

The participants at the industry training at Morvarid learned the importance hygiene and handling of food to reduce contamination or cross contamination, as well as proper cooking temperatures to kill bacteria if they are present on foods. The participants were also provided a food safety kit with materials to conduct a hand washing activity with their peers (glow-germ and UV light). The women who participated in the training will be able to apply this information to their daily work to help reduce contamination or cross contamination of ready-to-eat products that are sold. In addition, Morvarid has copies of the training materials so they can use it to train new employees. This will help ensure that the best food safety and hand washing practices are continued within the company.
Next Steps: The water quality and pesticide residue training is important information to bring awareness to these topics and areas of concern. Many more trainings like this could be given that will help train others regarding pesticide use and the importance of having water that is of good quality for drinking and irrigation purposes. Water can be a source of contamination for fresh fruits and vegetables, as well as these products being a vehicle for consumer exposure to pesticides and heavy metals. In addition, training more industries in the importance of food safety is important to ensure a stable and safe food supply for Afghanistan in the future.