Good Agricultural Practices (GAPs)

Slide 1:

Cover slide

Notes to instructor: Welcome participants to this training session. If this session is part of a larger workshop, tell the participants in this next session, an overview of Good Agricultural and Good Handling Practices will be presented and discussed.

Slide 2:

Notes to instructor: Review the learning objectives with the participants.

Slide 3:

Experts agree that fresh fruits and vegetables are an important part of a healthy diet. However, much of the fresh produce we consume is not cooked, so if the produce is not grown or handled safely, it could make someone sick. Good agricultural practices, often referred to as GAPs, are important in the production of safe, ready to eat fresh produce.

Slide 4:

This pie chart shows the outbreaks associated with produce from 1998-2008. Five fresh produce items make up over 80% of the outbreaks during this 10-year period. Of special concern are leafy greens, tomatoes, and melons that represent the top three foodborne illness outbreak sources, which also are purchased frequently by school districts in the U.S.

Slide 5:

Notes to instructor: Each area of concern will be addressed through Good Agricultural Practices principles to be explained in this training session.

Fresh produce can become contaminated in many ways. Pathogens or bacteria live and thrive in contaminated water, manure, soil, and living creatures like rodents, deer, and even people. When consuming fresh, uncooked produce, there is little that can be done to make it safe once it has become contaminated. You can't wash off all the bacteria, and you can't see or smell it, therefore you have no way of knowing whether it is contaminated. It is for these reasons that good agricultural and good handling practices are so critical to fresh produce production, distribution, preparation, and service.

Fruits and vegetables also can come in contact with industrial chemicals, metals such as lead or arsenic, or unsafe amounts of pesticides. At times, fresh produce

may become contaminated with physical hazards, like rocks or stems, during harvesting or processing. Again, preventing fresh produce from contamination is the key to a safe product.

Slide 6:

Bacteria can multiply rapidly in the right environment. Just take a look at this chart showing bacterial growth in the refrigerator, at room temperature, and body temperature. Maintaining the cold chain to prevent pathogens from growing on fresh produce keeps produce safe and nutritious.

Slide 7:

Developing a food safety plan for each step in the food production process based on good agricultural and good handling practices, or GAPs and GHPs, helps to minimize the risks associated with fresh produce. GAPs and GHPs are food safety recommendations and guidelines for farmers and distributors. Your school food safety plan, which is based on HACCP, is a similar program. Both are based on implementing proactive food safety practices aimed at preventing, reducing, or eliminating a hazard.

The next segment of slides will introduce you to the eight basic areas of a GAPs audit as outlined in the USDA Food and Drug Administration's Guidance for the Fresh Produce Industry. This is a brief GAPs overview. If you are required to apply GAPs concepts and practices in your school district through purchasing or school gardens, additional training is recommended.

Slide 8:

Principle one is choosing the right water source for the task. The quality of water must be considered safe for drinking if it is going to come into contact with the plant or produce. Fresh produce is very porous and can absorb pathogens from contaminated water. Leafy greens often are grooved and have crevices that may harbor pathogens from unsafe water. Know where your water comes from and have it tested at least annually if it is a non-municipal source.

Water that will not come into contact with the plant or produce is of lesser concern. The quality of water used in drip irrigation, for example, may be less than the EPA standards for safe drinking water because it is going directly into the soil. Environmentally, drip irrigation is ideal because less water is wasted.

Frequently flooded soil where food is grown should be tested for pathogens such as *E. coli.* Floodwater could come into contact with animal manure or other contaminants that are then deposited on soil and crops.

Slide 9:

Principle number two is manure use and handling. Properly handled manure is an exceptional fertilizer for plant growth and heath. Animal manure, especially cattle, sheep, and deer, may contain dangerous human pathogens, such as *E. coli.* To destroy these and other pathogens, manure is either properly composted or aged over time. Safe composting involves a process where manure reaches temperatures around 130 degrees Fahrenheit for several days, thus killing the pathogens with a heat treatment. Aged manure simply uses time and environmental elements like ultraviolet light rays from the sun to destroy pathogens.

If manure is not handled properly, pathogens could be introduced into the soil or on the plant or produce. Farmers should keep logs to document how manure is handled. Logs are reviewed during audits to ensure that the farm is in compliance with recommended composting procedures.

The location of manure on a farm is of concern because runoff after a rain could cause pathogens to spread to unintended areas. Farmers should consider the placement of manure to prevent runoff from reaching crops and cover the pile to help prevent spreading.

Slide 10:

Use of raw manure is of greater risk than composted or aged manure. GAP experts recommend that IF manure is used, it should be added the soil at least two weeks prior to planting and/or 120 days prior to harvest. Because pathogens can survive in the soil, it is best practice to maximize the time between applying raw manure and planting and harvesting to minimize the risk of produce contamination.

Slide 11:

Principles three and four go hand in hand to provide produce safety in the field. Principle three is worker health and hygiene. Just like the importance of foodservice worker health and hygiene to your food safety program, field workers' personal hygiene is critical for the farm's food safety program. Humans can contaminate fresh produce in an instant through lack of proper handwashing, or by working while sick. Field workers should follow food safety practices that are similar to employee food safety practices required in school kitchens. These practices include washing hands for 10 to 15 seconds, then rinsing with drinking water and covering open hand wounds with a bandage then glove. Field workers should not work with symptoms of vomiting, diarrhea, sore throat with fever, or if diagnosed with a foodborne illness.

If field workers are required to wear gloves, they should be changed when contaminated and hands should be washed prior to putting on new gloves.

Principle four is providing sanitary facilities for field workers. Ideal toilet facilities on the farm should prevent field contamination from worker wastewater and provide a handwashing station with safe drinking water, soap, and a means to dry hands and keep them clean. Ideal toilet facilities should be accessible to farm workers at all times, because when you have to go, you have to go, and you don't want to contaminate the field.

Slide 12:

Principle five is field sanitation. In the field, cross contamination of fresh produce with harvest containers, equipment, wild or domestic animals, soil, or water could result in a hazardous situation. Containers should be cleaned and sanitized on a regular basis, because it is easy for containers to become contaminated in the field from workers or contact with the soil. Stacking of containers is a concern because the bottom of the container came in contact with the soil. Also, farm personnel should discard any damaged containers or bins so that they are not used to transfer fresh produce.

Harvesting equipment typically operates in the dirt and may come into contact with manure, water, and other potential sources of contamination. This equipment should be cleaned periodically and checked for oil or gas leaks.

If produce is cleaned and washed in the field, harvest workers must take care to prevent contamination with poor quality water or by practicing poor personal hygiene.

Farmers should create reasonable barriers to prevent wild or domestic animals from entering the produce fields.

Slide 13:

Principle number six is packing facility sanitation. Whether fresh produce is packed in the field or in a packinghouse, care must be taken to prevent contamination from storage facilities, pests, containers and pallets, equipment, and machinery. Farmers who store or pack on-site should implement standard operating procedures with good handling practices, including cleaning and sanitizing, pest control, and worker health and hygiene.

Packing facilities should have a pest control program and avoid produce contamination by animals, such as dogs, cats, rodents, insects, and wild or domestic birds.

Slide 14:

Principle number seven is transportation. Fresh produce must be transported from the farm, through the supply chain, to your back door. Produce travels on ships,

trains, and trucks during distribution. Preventing cross contamination and maintaining temperatures for quality and safety are top priorities.

Produce should be protected from potential contamination by workers loading and unloading the product. Trucks should be loaded to prevent damage to fresh produce. If the outer skin of produce is broken, it becomes more susceptible to contaminants. Vehicles should be clean and operators should be aware of what was transported previously.

Slide 15:

The final GAP principle is traceability. The ability to trace a product one step forward and one step back is critical in the event of a food recall. Farmers and operators should maintain a recordkeeping system with date of harvest, farm and field identification, pack date, and who handled the produce from farm to receiver. Buyers should be aware that in some cases produce is repacked with produce from several farms before being distributed. This process makes traceback very difficult.

The fresh produce industry is aware of the traceability and recall concerns of buyers. In recent years, large produce growers and distributors have implemented electronic bar code tracking to improve traceability. GAPs audits will address the farm's responsibilities for traceability.

Notes to instructor: See Best Practices for Ensuring Traceability of Fresh Produce for more information on traceback/traceforward as part of the purchasing training segment.

Slide 16:

After this brief GAPs and GHPs overview, you may be wondering why a farmer would choose to implement and document an on farm food safety plan, then pay auditors every year to inspect their system.

Many large retail and foodservice buyers require its suppliers be GAP certified. Third-part GAP audits are based on FDA's *Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables*. USDA is a key provider of third-party GAP audits. As more and more large companies require GAPs audits, the environment in which schools purchase will be more receptive to being GAP certified.

GAPs audits enhance product marketability, and it just makes good business sense to provide the safest food possible to your customers.

Slide 17:

The cost for a GAP audit depends on the farm size, how prepared and organized the operation is and the specific audit company. The cost for a USDA GAP audit of a small farm is approximately $550.00. The grower is responsible to pay for the audit.

Slide 18:

USDA Organic is a labeling term that indicates that the food or other agricultural product have been produced according to USDA organic regulations. Organic operations must demonstrate that they protect natural resources, conserve biodiversity and use only approved substances. Organic regulations do not address food safety or nutrition. Both the organic and GAP programs require annual certification. An organic grower may consider GAP certification less of a challenge because they are already familiar with organic third-party audits and the organic recordkeeping requirements. Growers consider recordkeeping as one of the biggest challenges they face when developing a food safety plan and preparing for a GAP audit.

Slide 19:

Notes to instructor: As an option, go to http://www.ams.usda.gov/AMSv1.0/ams.fetchTemplateData.do?template=TemplateD&page=FreshFVGAPGHPStateIndex and click on your state to identify USDA GAPs certified farms. You may share this information with your participants.

If the district buys from an organization that requires farmers to obtain a GAPs audit, then the school district does not have to review the audit forms and document that on farm food safety practices are being followed. Districts that purchase directly from the farm may choose to require a GAPs audit. If you are purchasing produce through a distributor, the distributor may require farms to have a GAP audit, and will have verification available for you to review. You may want to talk to farmers in your area to find out how many local farms are GAPs certified. If few farms in your area are GAPs certified, you may limit your options by requiring a GAPs audit. You may still want to work with those farms to purchase produce, but it may take them some time to go through the steps to become GAPs certified. Local farmers who are not GAPs certified, but who want to sell product to the schools, may opt for a self-assessment checklist, such as the assessment tool available from Iowa State University.

Slide 20:

Self-assessment checklists, like the one developed by Iowa State University Extension, are designed to foster a conversation about food safety between the farmer and the buyer. School districts may give the checklist to the farmer, or make a site visit to the farm, and talk through the questions like an interview. It consists

of five major areas based on Food and Drug Administration's (FDA) eight GAP principles.

Slide 21:

There is a growing wealth of information on GAPs and GAP and GHP audits through universities such as Cornell, Penn State and University of California, Davis Campus, FDA, and state and local experts. Many states also offer workshops for farmers and may even have cost-share programs available through USDA grants to help farmers pay for GAPs audits. Farm-to-school organizations and other farmers already involved and implementing GAP practices may provide help or training.

Suggested Activity

Notes to Instructor: Hand out Iowa State University Extension's Checklist for Retail Purchasing of Local Produce. Show participants the following slides. After each slide allow participants time to answer yes, no, or N/A on the Iowa Checklist. If time permits, allow for discussion.

In this activity, a slide representing an on farm practice will be shown. Using the Iowa Checklist, choose yes, no, or not applicable (N/A) on whether the practice is safe according to GAPs and GHPs guidelines.

Slide 22:

Ask: Are wells protected from contamination?

Answer: No, the well is open.

Ask:

The bucket used to cover the wellhead will not keep the water source safe from what possible contaminates?

Notes to instructor: Possible answers include: microorganisms, pests, rodents, chemicals, physical contaminants, intentional contamination, etc.

Slide 23:

Ask: Are farm livestock and wild animals restricted from growing areas?

Answer: No, feces from cattle and deer are known to harbor *E.coli.*

Slide 24:

Ask: Is dirt, mud, or other debris removed from product before packing?

Answer: No. This product would not pass the receiving inspection at most schools.

Slide 25:

Ask: Are food grade packaging materials clean and stored in areas protected from pets, livestock, wild animals, and other contaminants?

Answer: No, these boxes are on the ground and exposed.

Slide 26:

Ask: Is product loaded and stored to minimize physical damage and risk of contamination?

Answer: No, the tomatoes in the bottom boxes are crushed.

Slide 27:

Ask: Again, is product loaded and stored to minimize physical damage and risk of contamination?

Answer: No, this product has been packed, but left exposed and in the open.

Slide 28

Ask: Is the transport vehicle well maintained and cleaned?

On many small farms, there are probably one or two tractors that are the workhorses of the operation. In cases such as these, it is very important that a routine maintenance and cleaning schedule be followed to help prevent cross contamination.

For example, if the farm uses raw manure on a regular basis, has one tractor and harvests fresh produce…then it may be safe to assume the manure tractor is also used as the harvest tractor, which could be a potential food safety concern.

Slide 29:

Ask: Is product protected as it travels from field to packing facility?

Answer: No. Concentrated product has a greater risk of external contamination than when on the tree, vine etc, therefore all harvested product should have some type of cover that prohibits contamination from getting on the product. There is also a risk of product receiving sunburn, chilling injury and or becoming wet during longer transportation times.

Slide 30:

Ask: Are packing areas kept enclosed?

Answer: Look closely at this slide. See the product moving under the employee's feet. Product is not protected from contamination in the packing facility.

Slide 31:

Ask: Is there a pest control program in place?

Answer: When inspecting facilities, especially packing houses, droppings make indicate the lack of a pest control program.

Slide 32:

Ask: Are workers and visitors following good hygiene and sanitation practices?

Answer: It appears the workers are wearing a hair restraint, but not gloves. Also, the hair restraint does not fully cover the employee's hair.

Slide 33:

Ask: Are smoking and eating confined to designated areas separate from produce handling?

Answer: No, harvest workers are eating in the produce fields.

Slide 34:

In summary, GAPs and GHPs help farmers provide safer food. Work positively with your local farmers to help them understand why on farm food safety practices are critical to the success of your local purchasing program.