

Good Agricultural Practices (GAP)

What is GAP?

Good Agricultural Practices, or GAP, are production and farm level approaches to ensure the safety of fresh produce for human consumption. GAP production and post-harvest guidelines are designed to reduce the risk of food-borne disease contamination on fresh produce. These voluntary procedures can be tailored to any production system. GAP recommendations are directed toward the primary sources of contamination: soil, water, hands, and surfaces.

Why is GAP needed?

GAP protocols were developed in response to the increase in the number of outbreaks of food-borne diseases resulting from contaminated fresh produce. These incidences have doubled in the U.S. since 1987. While most consumers associate food-borne diseases with improperly stored or poorly cooked animal products, it is clear that contaminated fruits and vegetables can also present a risk.

Produce can become contaminated by any of a number of microbes (bacteria, viruses, parasites, or fungi) at any stage of production, processing, packaging, or marketing. While the cooking process would normally kill these microorganisms, fresh produce is often consumed raw and thus, at risk. Research shows that the detection of residual pathogens prior to marketing



is extremely difficult. Similarly, it is very hard to sanitize harvested produce so that it is completely free of harmful microorganisms. The most effective strategy for reducing the risk of contamination is through prevention. GAP provides simple steps that fruit and vegetable growers can implement to greatly reduce the potential for contamination on the farm.

Consumer and retail concerns are understandable when these illnesses make front page news. Tainted foods are bad for business, both for the producer and for the marketer. Not only can serious immediate financial losses result, but contaminated foods also hurt consumer confidence in the long run. Growers who are able to provide assurances that their products are safe will have a marketing advantage.

While there have not been any outbreaks associated with Kentucky produce, a partnership of the Kentucky Department of Agriculture (KDA), the University of Kentucky Cooperative Extension, and the Department of Public Health is taking a proactive approach by developing and promoting the

**Crop Diversification
& Biofuel Research
Education Center**

GAP program. GAP is one way to help maintain the trust that currently exists between local growers, markets, and the consumer.

What are the basics of GAP?

Specific GAP steps are outlined in detail in the *Good Agricultural Practices Self Audit Workbook* developed by Cornell University. GAP principles can be summarized as follows: clean soil, clean water, clean hands, and clean surfaces. Examples of applicable procedures are listed below. These principles must be applied to all phases of production (field selection, pre-plant field preparations, production, harvest, and post-harvest) to be effective. GAP is focused on the prevention of contamination rather than attempting to remedy it after the fact.

“Clean soil” involves taking steps to reduce the possibility of introducing microbial contaminants into the soil, particularly via manure and other animal excrements. GAP addresses proper manure management with attention to composting, storage, and proper application timing. Additionally, due to the fact that many contaminants can be spread through animal feces, specific steps must be followed to minimize the presence of animals, both domestic and wild, in production fields and packing areas.

“Clean water” entails making sure all water used in washing, cooling, and processing is of drinkable quality, i.e. potable. Likewise, packing ice should also be made from potable water. Water is established as “potable” through testing and not merely based on a history of use. Ground and surface water sources need to be protected from run-off and animal contamination by buffer areas and fencing as needed. Water used for irrigation and foliar applications must also be tested to establish adherence to minimum quality levels.

“Clean hands” applies to workers and the use of good personal hygiene in the field and packing house. Providing washing facilities for customers at U-Pick operations is also an important consideration.

“Clean surfaces” means ensuring that all packing bins, work surfaces, storage areas, and transportation vehicles are properly washed and sanitized on a regular basis. Farms with both animal and produce operations must pay special attention to equipment shared between the operations and take specific steps to prevent contamination.

Compliance with GAP protocols can only be established through accurate recordkeeping. Record keeping is critical to enable the traceability or traceback function of GAP which makes it possible to follow a farm product as it is dispersed through the supply chain. If food-borne illnesses do occur, the contamination can then be traced to specific products, distributors, or farmers. This means that recalls can be specific, rather than general blanket programs that can disrupt entire commodities needlessly. Recordkeeping also helps growers establish that they executed due diligence in their production in the unlikely event that an outbreak is traced to their farm.

What is the Kentucky GAP Program and how does it work?

Kentucky’s GAP Program has three levels: (1) education, (2) self-audit, and (3) independent third-party certification. Currently Kentucky farmers are not required by any state or federal regulation to adhere to a GAP program in their production; it is entirely voluntary. This situation may change, however, when the U.S. Food and Drug Administration eventually releases specific GAP regulations as a result of the 2011 Food Safety Modernization Act.

It should be noted that producers providing raw product samples at Kentucky Farmers Markets and Kentucky Farm Bureau Certified Roadside Markets must possess a KDA GAP Training Certificate to qualify for the proper sampling certificate. Also, farmers participating in the WIC Farmers Market Nutrition Program must hold a GAP Training Certificate. Individual entities within the state also have established their own requirements for GAP. For example,

there are some farmers markets, produce auctions, and regional produce wholesalers that require participating farmers to complete GAP education training. Additionally, many of the largest wholesalers and retailers are requiring growers to have third-party GAP certification as a prerequisite to their purchasing any raw produce.

Education

The first part of Kentucky's program is education. A curriculum has been developed and given to county Extension agents to present to local producers. During this class, producers learn the best practices that will reduce the risk of their product becoming contaminated. Upon completion of the class the farmer receives a certificate (GAP diploma) issued by the KDA. Interested farmers should contact their county Cooperative Extension office.

Self-audit

The second step is the completion of a self-audit process using workbooks received during the GAP training class. This step allows producers to go over their operation step-by-step to identify possible deficiencies in production practices and make the necessary adjustments to ensure that the best practices are being followed. The self-audit materials establish a record of the steps that have been taken, thus better enabling the farmer to address future concerns. These self-audit materials are also available through the KDA, online at the KDA Web site, and from participating county Extension offices.

Certification

A third level to GAP is Third-Party Audit Certification. This level is usually only required for producers selling to large buyers. Certification involves the development of a farm food safety manual, an initial on-farm inspection, and a surprise audit conducted during harvest. These steps must be completed annually to obtain and/or retain certification.

The food safety manual developed by the grower will be unique for his or her enterprise and must

explain the farm operation in detail. The manual, which serves as a reference for the producer, will be utilized in the third-party audit process. The KDA GAP Educational Resources Web page contains links to a number of resources and templates that are available online to assist growers in compiling the manual.

Audit expectations are based on the Food and Drug Administration (FDA) manual, *Guide to Minimize Microbial Food Safety Hazards for Fresh Fruit and Vegetables*. A link to this publication, as well as the USDA audit checklist, can be found at the end of this profile.

How much does GAP cost?

The GAP training materials and courses are free to Kentucky farmers. Third-party GAP certification, on the other hand, typically runs approximately \$800 to \$1,200 for many growers. The KDA is offering a cost-share program to assist growers in covering certification expenses; contact them for an application.

The costs of implementing GAP will vary from farm to farm. Most Kentucky farmers will find that their operations are largely compliant with GAP principles. Even minor, inexpensive, and easily adapted changes to a farm operation can have a very positive influence on the safety of produce. Few operations will need to make a large number of changes to comply with the guidelines. Food safety requires a higher level of care and management – all of which can be costly. However, food contamination that leads to an outbreak of human illness can be even more costly in terms of dollars, loss of markets, and ruined reputation.

For further details, resources, contact information, and program updates, refer to the KDA Web site or contact your county Extension office.

Selected Resources

- Kentucky Good Agricultural Practices (GAP) Program (Kentucky Department of Agriculture) <http://www.kyagr.com/marketing/GAP.html>

- Kentucky Good Agricultural Practices Educational Resources (Kentucky Department of Agriculture)
<http://www.kyagr.com/marketing/GAP-resources.html>
- Commodity Specific Guidance (North Carolina State University)
<http://ncfreshproducesafety.ncsu.edu/good-agricultural-practices/commodity-specific-guidance>
- Comparison of GAPs Governing the Growing and Harvesting of Fresh Produce (Georgetown University, 2007)
http://www.pewhealth.org/uploadedFiles/PHG/Content_Level_Pages/Reports/PSP-RPT-GAP-Governing-Fresh-Produce.pdf
- Food Safety Begins on the Farm: A Grower's Guide to Good Agricultural Practices for Fresh Fruits and Vegetables (Cornell University, 2000)
<http://www.gaps.cornell.edu/FSBFEng.html>
- Food Safety Modernization Act (U.S. Food and Drug Administration)
<http://www.fda.gov/food/foodsafety/fsma/default.htm>
- Fresh Produce Audit Verification Program (USDA)
<http://www.ams.usda.gov/AMSV1.0/gapghp>
- GAPsNET: National GAPs Network for Education and Training (Cornell University)
<http://www.gaps.cornell.edu/index.html>
- Good Agricultural Practices and Good Handling Practices Audit Verification Checklist (USDA, 2009) 31 pp.
<http://www.ams.usda.gov/AMSV1.0/getfile?dDocName=STELPRDC5091326>
- Good Worker Health and Hygiene Practices: Training Manual for Produce Handlers (University of Florida)
<http://edis.ifas.ufl.edu/pdf/FY/FY74300.pdf>
- Guide to Minimize Microbial Food Safety Hazards for Fresh-cut Fruits and Vegetables (USDA Food and Drug Administration, 2008)
<http://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/ProducePlantProducts/ucm064458.htm>
- Illustrated Guide to Growing Safe Produce on Your Farm: GAPs (ATTRA, 2010)
<https://attra.ncat.org/attra-pub/summaries/summary.php?pub=350>
- Reduce Microbial Contamination with Good Agricultural Practices (Cornell University, 2006)
<http://www.gaps.cornell.edu/Educationalmaterials/Samples/PamphletEng.pdf>

Reviewed by Janet Eaton, Kentucky Department of Agriculture (Issued 2007)

Reviewed by Adam Watson, Kentucky Department of Agriculture (Revised 2010)

Photo by Matt Barton, UK Agricultural Communications;

Logo courtesy of GAPsNET (Cornell)

updated January 2012

For additional information, contact your local [County Extension](#) agent