



Good Agricultural Practices (GAPs) Training Initiative

N. C. MarketReady
www.ncmarketready.org
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Acknowledgments

We gratefully acknowledge the valuable contributions from and support of the multidisciplinary team comprised of the following: N.C. A&T and N.C. State University, N.C. Department of Agriculture, N.C. Cooperative Extension county agents, N.C. Governors' Food Safety and Defense Task Force, N.C. Fresh Produce Safety Task Force and the fresh produce industry. All have helped to develop and review this educational curriculum. Through the team's professional expertise, active participation and feedback, the curriculum contains relevant, responsive and interdisciplinary insights to increase the safety of fresh produce for our food and farming systems.

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Disclaimer

The information presented in this publication is provided for educational purposes. While the authors made every attempt to obtain the most recent and accurate information, fresh produce safety is an issue that is quickly changing. The authors are not responsible for any content modification by users.



Introduction & Background

The safety and security of our food systems are paramount concerns for the American people. According to the Centers for Disease Control and Prevention, 6,647 outbreaks of food-borne disease were reported from 1998 to 2002, with more than 128,000 persons becoming ill. The estimated economic impact of these outbreaks is between \$10 and \$83 billion. The issues of food-borne illness and food safety are at the forefront of our national concerns. To reduce the incidence of food-borne illness, food handlers must understand and practice safe food-handling behaviors from “field to family.”

In 2008, an outbreak of *Salmonella* Saintpaul bacteria was linked to raw tomatoes and peppers. As the largest outbreak of food-borne illness in a decade, it attracted national attention, as did a 2006 outbreak of *E. coli* H7:0157 from bagged spinach. As these stories unfold, reported illnesses increase, consumer confidence plummets and growers across the nation feel the impact. With heightened public concerns, growers selling their produce have come under more scrutiny to ensure the safety of their products. Fresh produce has become a lightning rod in the storm over food safety with recent estimates that it causes more illnesses than any other food category.

As early as 2007, the safety of fresh produce was designated as a key concern by North Carolina governments, universities and industries. To better address these food safety needs from field to fork, a multidisciplinary team formed the NC Fresh Produce Safety Task Force. According to growers, “North Carolina can be proactive in the area of

fruit and vegetable safety and use this as a tool to develop confidence in North Carolina-produced products.” With the backing of growers and grants from the N.C. Tobacco Trust Fund Commission, Sustainable Agriculture Research and Extension (SARE) and Risk Management Agency, the fresh produce safety initiative was on its way. Within one of the developed working groups of the NC Fresh Produce Safety Task Force, plans began on the development of a Good Agricultural Practices (GAPs) training curriculum.

Overview

The N. C. MarketReady Fresh Produce Safety – Field to Family curriculum has been developed for and targeted to the needs of educators such as North Carolina growers and the N.C. Cooperative Extension agents. This curriculum will complement the GAPs and Good Handling Practices (GHPs) outlined in the FDA/USDA “Guide to Minimizing Microbial Hazards in Fresh Fruits and Vegetables.” It will also address recent needs surfacing from USDA GAPs/ GHPs audits, other third-party audits and the GAPs certification process. It is designed as a train-the-trainer resource with an emphasis on increasing an understanding of the microbial risks associated with producing, harvesting, washing, sorting, packing and distributing fresh fruits and vegetables.

The resources developed include this printed manual of the curriculum, with a corresponding jump drive containing electronic copies of PowerPoint slides, video clips (2) and media support documents for the branded program. A special thank you to the University of Minnesota

for allowing us to use video that shows good and bad examples of growers responding to media questions in an outbreak situation. Additionally, The Produce Lady makes an impressive review of tips for the handling of fresh produce for growers and consumers. The curriculum is divided into nine modules, with each module encompassing 1-1.5 hour blocks of instruction. Each module provides a PowerPoint presentation, a MS Word document with more in-depth notes and references, learned experiences/exercises and handouts when appropriate, and pre-post tests (Modules 8 and 9 do not have pre-post tests).

If you have not attended the original train-the-trainer workshops offered in late 2008 and early 2009, we suggest you work with other agents who have attended. Ideally, we would like to create at least one “fresh produce safety” team in each district. Don’t forget to integrate the programmatic strengths of N.C. Cooperative Extension. Fresh produce safety reaches across program areas in family consumer science and horticulture, and it includes the work of agriculture agents and possibly even 4-H agents.

Training Tiers and Program Design

Upon the recommendation by N.C. Cooperative Extension faculty and North Carolina growers, a tiered educational program has been developed to encompass the wide range of growers' needs reflecting farm size, markets and associated commodity-specific risks. It is designed to give producers a proactive, educational and incentive-based program for their individual needs. As such, the modules within this curriculum serve as the basis for a progression of training tiers that will be developed in totality. For now, Tier 1 and Tier 2 specifics are included below.

Tier 1 is the basic level of fresh produce safety training.

- Content Covered: fresh produce-safety basics, pathogen introduction, GAPs for field practices, GHPs for packing facilities, proper health and hygiene, water quality, site selection and manure management.
- Agents will deliver content of these modules and collect evaluations from participants.
- Train from Module 1 to 6.
- Total of seven hours of instruction.
- Certificate of Attendance will be issued to participants.
- Charges: We encourage agents to charge a nominal fee to cover the resources given to participants.
- Suggestions on conducting instruction of this tier: ideally break-up into a series of three two-hour classes, assigning homework for each session.

Tier 2

- Content Covered: transportation, traceability and recalls, liability and insurance options, crisis strategy, and risk management.
- Specialists will be responsible to deliver content of these modules and collect evaluations from participants.
- Train from Module 7 to 9, plus risk identification and management workshops.
- Total of seven hours of instruction.
- Certificate of Attendance will be issued to participants.
- Charges: fee-based workshops.
- Suggestions on conducting instruction of this tier: ideally one-day workshop at least annually.

The N. C. MarketReady Brand and Guidelines for Usage

N.C. MarketReady is a N.C. Cooperative Extension program, with faculty from both N.C. State University and N.C. A&T State University actively participating. This includes personnel from numerous university departments and Cooperative Extension agents at the county and state levels. The N.C. MarketReady (formerly the Program for Value-Added & Alternative Agriculture) team administers the program.

The program's name or brand was based on market research with food industry representatives and others. A brand helps provide a mental imprint of a product, service, event, individual or organization. Through the N.C. MarketReady brand, we present a unified look and message that are communicated in a consistent way to enhance integrated programming and marketing efforts and, thereby, recognition in the marketplace. Inherent in the name N.C. MarketReady is the message that our educational programs help producers prepare to compete effectively in the market. "Market ready," or being ready for market, implies all facets of a business: research, business planning, production, management and food safety.

Depending on the focus area of the N.C. MarketReady program—fresh produce safety, business skills education, agricultural and alternative agriculture enterprise development, strengthening markets, horticultural skills education—you may see a tagline used with the brand name. In this case, N.C. MarketReady Fresh Produce Safety – Field to Family designates curriculum and other resources that are provided as part of N.C. Cooperative Extension's fresh produce-safety initiative.

N.C. MarketReady Fresh Produce Safety – Field to Family

Based upon recommendations by N.C. Cooperative Extension faculty and North Carolina growers, the team is developing a tiered educational program to help growers address and minimize commodity-specific risks, adapt to a changing marketplace and improve profitability. This N.C. MarketReady Fresh Produce Safety – Field to Family curriculum includes training modules for Tier 1 and Tier 2. (Please refer to the Training Tiers section of this notebook.)

Because N.C. MarketReady Fresh Produce Safety – Field to Family is a branded program, we specifically request that you use the materials as presented. We understand that presentation styles may vary, and that’s perfectly acceptable. We also are aware that Cooperative Extension agents often incorporate experiential activities to enhance the curriculum and that, too, is acceptable. However, because this is a branded program, it is not acceptable to change the content or delete portions of the content. By your acceptance and use of this branded curriculum you should keep the curriculum intact with no revisions or adaptations. This material consists of the “basic minimum” that must be presented for a grower to successfully complete the requirements of Tier 1 and Tier 2. The curriculum has been peer reviewed and has a large working group standing behind it. It contains the basics that need to be provided to growers during training. If you make changes to the curriculum or delete portions of the content, do not use the N.C. MarketReady Fresh Produce Safety – Field to Family name and logo.

Your adherence to these guidelines helps ensure the programmatic integrity of the N.C. MarketReady brand. It also allows for the consistent and accurate sharing of program information with both internal and external audiences, including funding and industry partners, elected officials and news media outlets.

When using the N.C. MarketReady logo, always make sure that it is used with the N.C. Cooperative Extension logo. Because this is a new brand for N.C. Cooperative Extension, usage guidelines are in development. Please refer to www.ncmarketready.org, “Agents Resources” section, for the most up-to-date guide.

The N.C. MarketReady team will continue its work with campus and field faculty to build partnerships and educational resources to help North Carolina agriculture be more profitable. The N.C. MarketReady Fresh Produce Safety – Field to Family curriculum is just one of many resources that will be available under this new brand. The N.C. MarketReady team in cooperation with other faculty will provide a menu of N.C. MarketReady programs and materials. These will be available at www.ncmarketready.org.

For questions regarding the N.C. MarketReady brand and its use, please contact:

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Promoting NC MarketReady Fresh Produce Safety Workshops

Along with this curriculum, you are being provided with a news release, editable PDF flier and e-mail “blurbs” that you may use to promote the educational training sessions you present to growers in your county. In addition, we will be communicating with various target audiences—Extension clientele, industry, N.C. Fresh Produce Safety Task Force members, news media, agricultural media and others—about this branded program. Some of our communication efforts will direct people to counties for more information on how this curriculum is being used.

Permission to Use N.C. MarketReady Materials

N.C. MarketReady Fresh Produce Safety – Field to Family was developed by N.C. Cooperative Extension faculty for use in North Carolina. For more information on the use of this curriculum, the Tier educational program or the use in other states, please contact:

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Photo Credits for PowerPoint Slides

Module 1: Fresh Produce Safety Introduction

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Slide 8: Center for Disease Control, MMWR Sep 29, 2006
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Slide 29: Journal of Food Protection, volume 65 Pages18-23
Slide 30: General pictures from Yahoo Image Gallery (<http://images.search.yahoo.com/>)
Slide 33: Guidance for Industry (<http://www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/ProduceandPlanProducts/ucm064574.htm>)
Slide 38: General pictures from Yahoo Image Gallery (<http://images.search.yahoo.com/>)
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Slide 40: WC Hurst, University of Georgia
Slide 41: WC Hurst, University of Georgia

Module 2: GAPs Field Practices

Slide 1: General Picture Gallery of Google images (<http://images.google.com/>)
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Slide 7: Jim Rushing, Clemson University
Slide 14: Food and Drug Administration (www.fda.gov)
Slide 17: Food and Drug Administration (www.fda.gov)
Slide 19: Darbie Granberry, University of Georgia
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Slide 50: General pictures from Yahoo Image Gallery (<http://images.search.yahoo.com/>)
Slide 51: Trevor Suslow, University of California
Slide 52: Jeff Brecht, University of Florida
Slide 56: Trevor Suslow, University of California

Module 3: Packing Facility Sanitation (GHPs)

Slide 1: Jeff Brecht, University of Florida
Slide 5: Jeff Brecht, University of Florida
Slide 6: Trevor Suslow, University of California
Slide 7: Jeff Brecht, University of Florida
Slide 8: WC Hurst, University of Georgia
Slide 11: Jim Rushing, Clemson University
Slide 12: Jim Rushing, Clemson University
Slide 13: Trevor Suslow, University of California

Slide 14: Brad Easterling, Texas A&M University
Slide 15: Jeff Brecht, University of Florida
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Slide 24: Trevor Suslow, University of California
Slide 29: Jeff Brecht, University of Florida
Slide 30: WC Hurst, University of Georgia

Module 4: Health & Hygiene (Maria 16)

Slide 1: General Picture Gallery of Google images (<http://images.google.com/>)
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Slide 47: Diane Ducharme, NCSU
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Module 5: Animals, Animal Byproducts, Biosolids and Site Selection

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Slide 21: Presentation by Doug Sanders, NCSU
Slide 22: Presentation by Doug Sanders, NCSU
Slide 23: M.H. Ferguson, NCSU
Slide 26: Trevor Suslow, University of California
Slide 67: Slide Modified from Doug Sanders Presentation, NCSU
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Module 6: Water Quality

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Slide 16: General Picture Gallery of Google images (<http://images.google.com/>)
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Slide 19: Keith Baldwin- NC A&T, Billy Little, NCSU
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Slide 36: Garry Grabow, NCSU
Slide 37: Billy Little, NCSU
Slide 48: Food and Drug Administration (www.fda.gov)
Slide 52: Nancy Creamer, NCSU
Slide 55: General Picture Gallery of Google images
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Slide 58: General Picture Gallery of Google images
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Slide 59: General Picture Gallery of Google images
(<http://images.google.com/>)
Slide 64: WC Hurst, University of Georgia
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Slide 66: WC Hurst, University of Georgia

Module 7: The 3 T's: Transportation, Traceback and Traceforward

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Slide 3: Trevor Suslow, University of California
Slide 5: <http://ucce.ucdavis.edu/files/filelibrary/6123/40400.jpg>
and [http://barblog.foodsafety.ksu.edu/lettuce-skull\(2\).jpg](http://barblog.foodsafety.ksu.edu/lettuce-skull(2).jpg)
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Slide 9: CFSAN "Inspecting Incoming Materials" website
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Gallery of Google images (<http://images.google.com/>)
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Slide 36: United Fresh produce Traceability Initiative
(<http://www.producetraceability.org/>)
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Slide 42: United Fresh produce Traceability Initiative
(<http://www.producetraceability.org/>)
Slide 48: Website picture captured from Food and Drug
Administration (www.fda.gov)
Slide 57: Cover picture of publication captured from http://www.producetraceability.org/pdfs/CPMA_PMA_Traceability_Guide.pdf

Module 8: Managing Liability and Risk

Slide 1: General Picture Gallery of Google images
(<http://images.google.com/>)
Slide 7: USDA, Agricultural Marketing Service, Market News Service
Slide 8: Perishables Group, Facts, Figures & the Future
(http://www.factsfiguresfuture.com/archive/july_2004.htm)

Module 9-A: Dealing with Controversies and Crises: Working with the News Media

Slide 1: NCSU Stock Photo
Slide 14: USA Today
Slide 18: Darrell Blackwelder, N.C. Cooperative Extension
Slide 19: Salisbury Post
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Slide 23: NCSU Stock Photos
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Module 9-B: Dealing with Controversies and Crises: Working with the News Media

Slide 1: NCSU Stock Photo
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Slide 16: Salisbury Post
Slide 21: NCSU Stock Photo