



# Developing a Youth Curriculum to Teach Home Food Processing

Elizabeth L. Andress, Ph.D., Kasey A. Christian, M.Ed. and Dorothy E. Dupree, M.S.  
Department of Foods and Nutrition, University of Georgia, Athens, GA



## ABSTRACT

### Introduction:

Home food processing and preservation provides a platform for hands-on instruction in food science that fulfills established career and STEM initiatives in schools as well as enrichment for community youth programs. An original *PUT IT UP! Food Preservation for Youth* curriculum was developed to address the science and methods in acid and low-acid food canning, pickling, freezing, making jam and drying preservation of foods. The curriculum is matched to Next Generation Science Standards™ and Common Core State Standards® in Math; it is presented in a format familiar to Cooperative Extension and other community youth organization leaders.

### Method:

Development of the curriculum was informed by input into basic constructs and format from a focus group of 14 Cooperative Extension educators from across the U.S. followed by pilot testing and evaluation of an original curriculum. The package contains a leader's guide and 6 units with different food preservation methods. A total of 174 youth aged 6 to 18 years old participated in 24 different programs led by 13 different community educators. Participants completed a pre-test, post-test, and evaluation with each lesson. This formative assessment guided refinement as well as additions to teacher guidance.

### Results:

Pilot programming demonstrated youth increased knowledge about pH, food acidity, and temperature as they relate to food preservation. Behavior and attitudes regarding the importance of preserving food as well as the science of food and liking of science were also evaluated and showed improvements. *PUT IT UP! Food Preservation for Youth* can engage youth in food science in an interactive manner. The developmental research and implementation processes resulted in an available, flexible and science-based youth curriculum suitable for various age groups and educational settings.

### Significance:

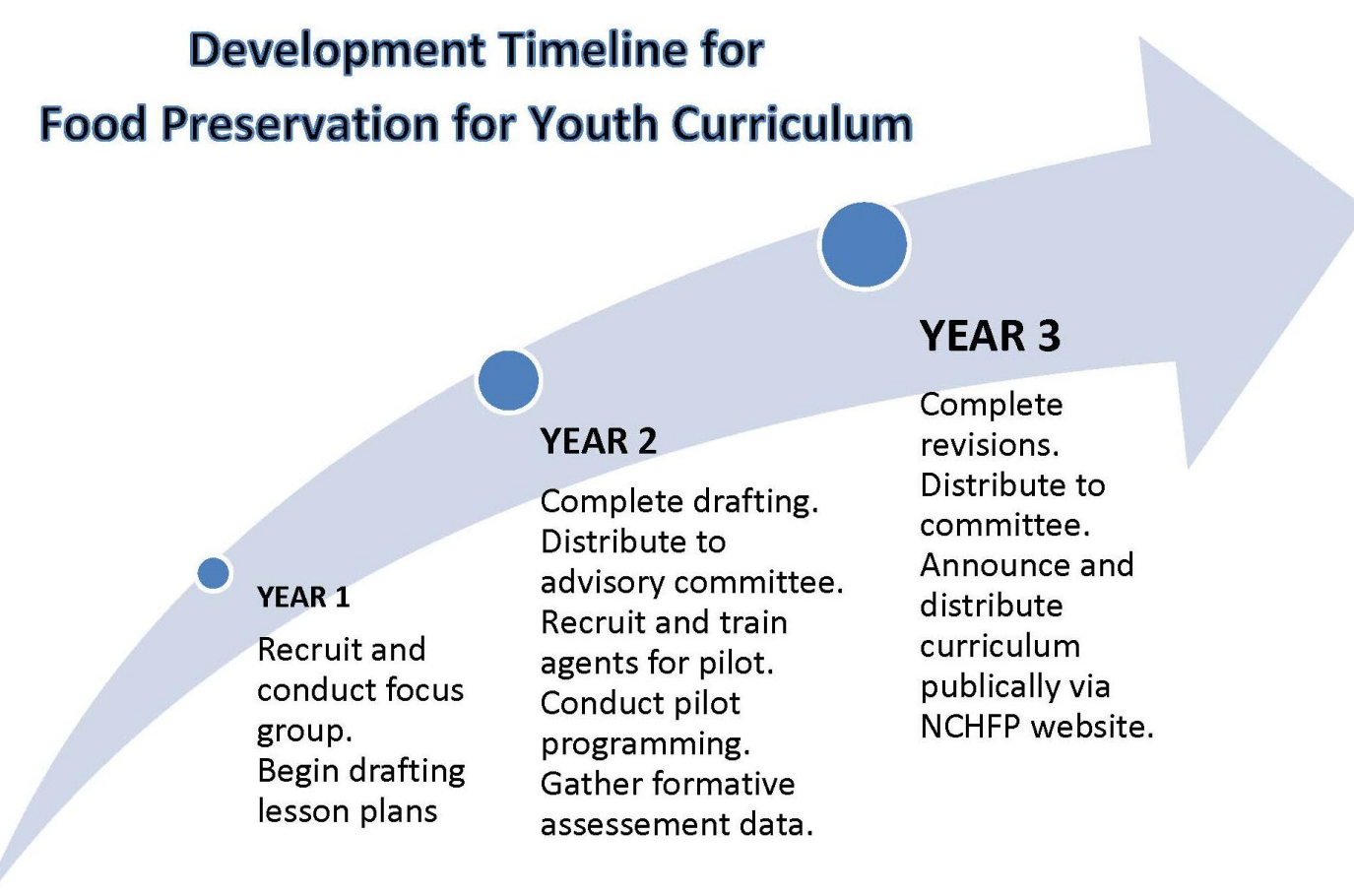
School teachers as well as community youth group leaders must engage students in career pathway as well as STEM initiatives and are often challenged to identify interactive, easily implemented curricula. Food processing and preservation methods offer abundant opportunities to engage youth in educational yet practical science-based learning. This curriculum connects them to hands-on manipulation of food and applications of sciences while increasing knowledge about our food supply and its value to health.

## METHODS

### A Three-Year Plan

There is an educational need for science-based practices in home food preservation (Andress, D'Sa, Harrison, Kerr, Harrison, & Nummer, 2002; D'Sa, Andress, Harrison, & Harrison, 2007). The project was conducted by the National Center for Home Food Processing and Preservation and met an outreach goal to develop, implement and evaluate a series of six youth lesson plans on home food preservation. The study design, methods and instruments for the pilot programming were approved for use with human subjects by the Institutional Review Board at the University of Georgia.

A three-year timeline laid out the trajectory of work:



### Focus Group Planning

14 focus group members from land-grant universities across all regions of the U.S. were identified. Preliminary assessments led to suggestions for the six food preservation methods to be covered in the lessons; focus group members were then asked to share their thoughts on those suggestions as well as to respond to the following questions:

- What age/grade level should the lessons target?
- Should pressure canning be included as a lesson?
- How long should the lessons/classes be?
- What is the maximum practical number of participants for a class?
- Where would youth classes typically be offered?
- What kinds of teaching aids might be helpful for different venues?
- What materials will be needed to recruit youth for the pilot study?
- Anything else?

### Pilot Testing

Focus group input provided formative constructs for drafting the curriculum consisting of a leader's guide and 6 lesson units, each containing a beginning and advanced hands-on preservation activity. Focus group members also agreed to serve as Advisory Committee members for reviewing the curriculum. Pilot program volunteers were recruited from Clemson University and University of Georgia Cooperative Extension to teach the drafted lessons to youth.

*PUT IT UP! Food Preservation for Youth* was piloted by 13 Cooperative Extension educators in a total of 24 programs – 12 programs in Georgia and 12 in South Carolina. Pilot program leaders were given paper copies of lessons, materials for hands-on activities (i.e., canners, dehydrators, produce), and assessment/evaluation forms for both leaders and youth. Each pilot lesson was evaluated by at least one Extension educator. In some cases, assistant leaders were recruited; two of these helpers completed evaluations for a total of 26 leader evaluations.

A total of 174 youth participated in pilot programming and were asked to complete a pre-test, post-test, and evaluation. Actual numbers of forms completed varied: 172 knowledge pre-tests, 171 knowledge post-tests, and 164 evaluations. These responses provided formative assessment that was critically valuable to final curriculum development.

Pilot programming included youth from 4-H, Boys and Girls Clubs, Girl Scouts, home-schools, and the Children, Youth, and Families At Risk Extension Program (CYFAR). Participants ranged from 6 to 18 years old and varied in socio-economic status, ethnicity, and gender. The activities are designed for middle school ages; however, we found that they are appropriate for 4th- to 12th-graders depending on prior experience with food preparation and sciences.

## RESULTS

A comparison of youth pre-tests and post-tests shows increases in knowledge in all subject areas except one — there was a slight decrease in the number of participants who knew that water availability affects microorganisms. During revision, content about water availability was re-written to be more clear in “Why Preserve?” sections. Since the percent of youth correct on the post-tests ranged between 60% and 80% in most subject areas, improved diagrams and “fun facts” were added to procedure sections in the various methods to try to boost content learning, and additional activities focused on acidity/pH were also developed and are included in the final curriculum.

## RESULTS, cont.

Table 1.

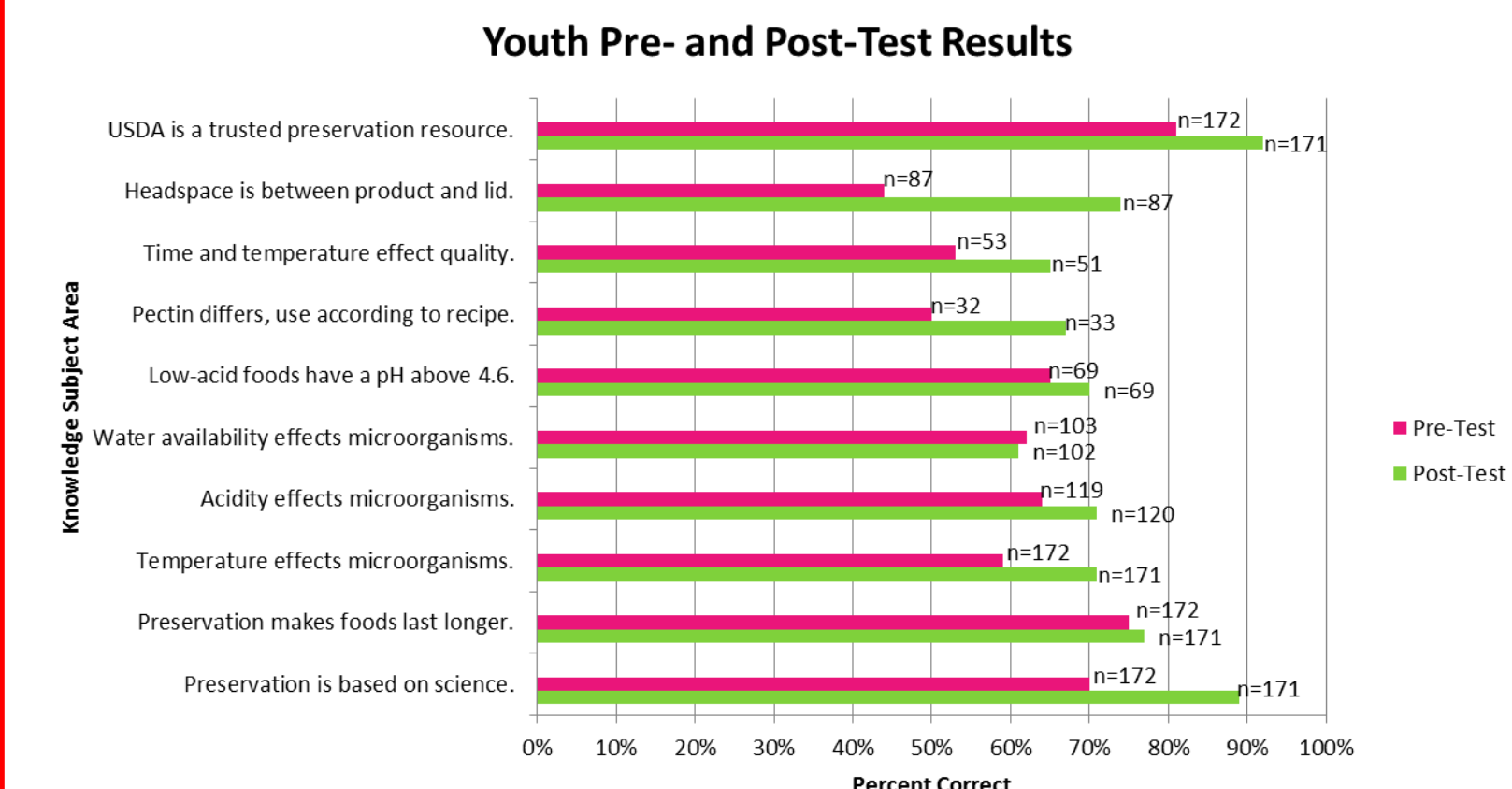


Table 2. (n=165)

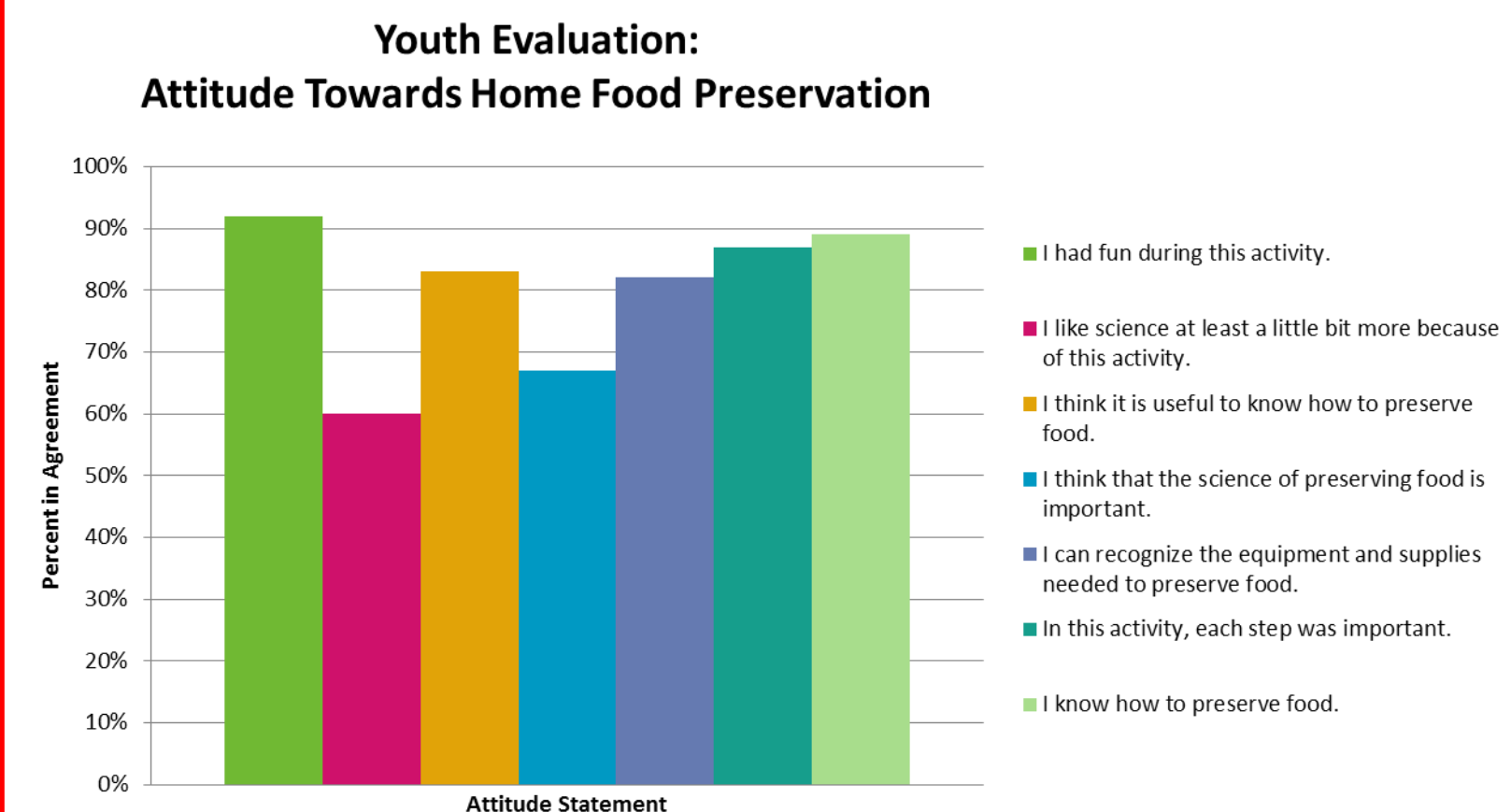
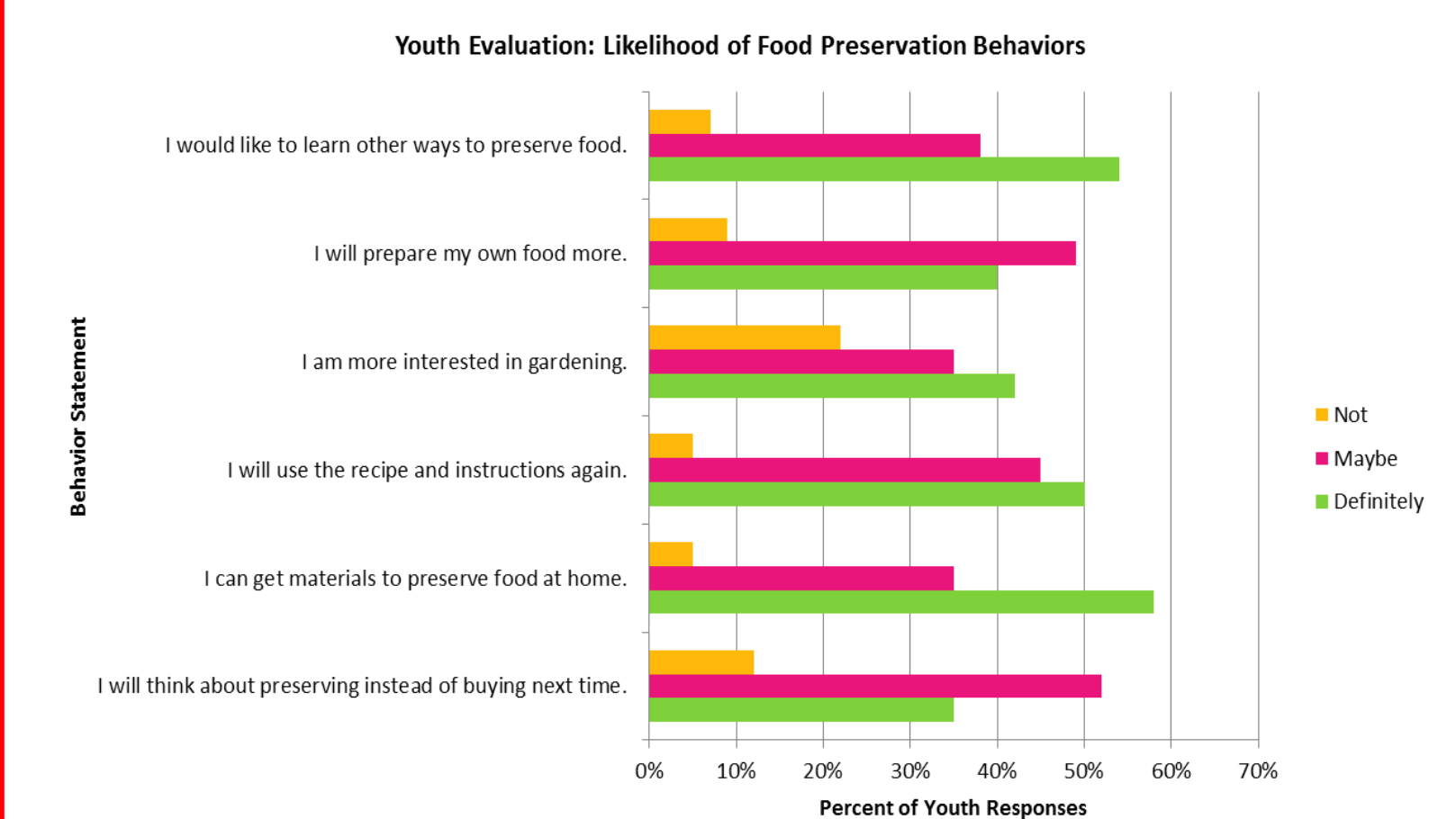


Table 3. (n=164)



## RESULTS, cont.

Along with the post-test, an evaluation was given to youth after they participated in the hands-on preservation activities. The evaluation contained questions regarding the influence of the program on attitude and behavior. Though it was limited in not having a comparative pre-program value, it was designed to inspire reflection and collect information of perceived change without increasing the overall burden of “test” time for the youth participants.

Leader evaluations were also integral to curriculum development. In addition to affirming that the majority of participants were constantly engaged in the activity and that diverse interests and needs were completely or mostly met in 96% of the programs, leaders also provided suggestions for meeting those needs, and their suggestions were added to “Teacher’s Tips” in the Leader’s Guide. All leaders reported to enjoy leading the lessons very much or for the most part.

Questions regarding distribution of the curriculum were also asked and used to determine the preferred format of distribution (loose pages to be copied, double-sided, with margins for a three-hole punch) and the willingness to pay for bound color copies (a small amount).

Each of the six preservation methods in the final curriculum contain a one-page summative youth assessment with questions about knowledge, attitude and behavior. The Leader’s Guide includes answer keys and instructions for leaders to copy and distribute “What Do You Know About...” pages both before and after their program in order to assess knowledge, attitude and behavior change. Leaders are also given a “Leader Feedback” page at the end of the Leader’s Guide and are encouraged to complete and return this form, or fill it out online, so that the curriculum can continue to be improved.

The curriculum is available to download from <http://nchfp.uga.edu>

## REFERENCES

- Andress, E.L., D’Sa, E.m., Harrison, M.A., Kerr, W.L., Harrison, J.A., & Nummer, B.A. (2002). *Current Home Canning Practices in the U.S.* Retrieved from <http://nchfp.uga.edu/papers/2002/02canningsurveyfinal.pdf>
- D’Sa, E.M., Andress, E.L., Harrison, J.A., & Harrison, M.A. (2007). *Survey of home canning practices and safety issues in the U.S.* Retrieved from [http://nchfp.uga.edu/papers/2007/canning\\_survey.html](http://nchfp.uga.edu/papers/2007/canning_survey.html)

## ACKNOWLEDGMENTS

Dr. Susan Barefoot, Dr. Judy Harrison, Focus Group/Advisory Committee members, Pilot Program leaders, and Youth participants.

This project is based upon work supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under Agreement No. 2011-51110-30995.