

Farm Food Safety Workshop Evaluation

All Workshop Locations Winter 2011

In winter 2011, Penn State Cooperative Extension conducted workshops on on-farm food safety practices in eight separate locations, including Altoona, Dupont, Greensburg, Lancaster, Leesport, Mifflinburg, and North East. Topics included relevant issues related to Good Agricultural Practices (GAPs) in order to help prepare fresh produce growers to properly implement and document GAPs on their farms. Across the eight workshops, 219 individuals participated. Before and after each workshop, an evaluation survey was administered to the participants that asked questions related to participants' GAP knowledge, skills, attitudes and behaviors. In total, 176 evaluations were completed by participants. This report documents the findings from the completed evaluations.

1. For each statement, circle either true or false.

Before workshop			After workshop	
Correct Answers	Incorrect Answers		Correct Answers	Incorrect Answers
106 63.9%	60 36.1%	USDA standards require that pond water used for irrigation be tested for microbes at least 3 times during the growing season (True) (n=166)	159 95.8%	7 4.2%
95 56.5%	73 43.5%	After hand washing, hands should be dried thoroughly with a clean cloth towel (False) (n=168)	130 77.4%	38 22.6%
113 70.6%	24 15.0%	The FDA Food Safety Modernization Act recently passed by Congress requires all produce growers to submit to a farm audit (False) (n=160)	136 85.0%	24 15.0%
137 83.5%	27 16.5%	Produce harvested into boxes or bins should be covered when they are transported to a packing house (True) (n=164)	160 97.6%	4 2.4%
109 69.4%	48 30.6%	It is possible for manure-based compost to be safely applied around produce crops (True) (n=157)	103 65.6%	54 34.4%
158 96.9%	5 3.1%	Drip irrigation methods are more likely to cause crop contamination than overhead spraying (False) (n=163)	159 97.5%	4 2.5%
106 67.5%	51 32.5%	USDA audit standards require produce growers to prove that wild animals are not able to enter fields (False) (n=157)	110 70.1%	47 29.9%
92 57.9%	67 42.2%	Fresh fruits and vegetables are responsible for the greatest number of foodborne illnesses (True) (n=159)	147 92.5%	12 7.5%
108 67.1%	53 32.9%	Hand sanitizer sprays are an acceptable substitute for hand washing (False) (n=161)	156 96.9%	5 3.1%
72 46.8%	82 53.2%	USDA audit standards require packing areas to be fully enclosed (False) (n=149)	136 88.3%	18 11.7%

Overall, knowledge was gained by workshop participants. Of the 176 respondents, 136 participants provided responses to all 10 true/false statements both before and after the workshop. The overall mean for these 136 respondents before the workshop was 6.69 (out of a possible 10), which rose to 8.64 after the workshop. The mean of correct answers, therefore, positively increased by 1.95. The largest difference (41.5%) occurred for the statement on enclosing packing areas. Correct answers rose from 46.8% before the workshop to 88.3% after the workshop. Locations in which the largest increases for this statement occurred were Chambersburg (53.0%), Dupont (61.1%), Leesport (41.7%), Mifflinburg (42.1%), and North East (58.8%). A 34.6% increase in correct answers occurred for the statement about the number of foodborne illnesses, from 57.9% beforehand to 92.5% afterward. For the statement regarding pond water irrigation, the percentage of correct answers increased by 31.9%, from 63.9% before the workshop to 95.8% after the workshop. The statement regarding manure-based compost was the only statement in which a decrease in correct answers occurred, declining by 3.8% from 69.4% beforehand to 65.6% afterward. Locations in which decreases in correct answers for this statement occurred were Lancaster (9.6%), Chambersburg (5.9%), Dupont (11.1%), Greensburg (7.7%), and Leesport (8.7%). Although the percentage of correct answers for the statement regarding wild animals increased overall, a decrease in correct answers occurred in Chambersburg (16.7%) and Greensburg (4.5%).

2. Listed below are skills involved in documenting your GAP practices. Please circle your level of confidence in your ability to do these things. Use the scale 1 = Not At All Confident through 5 = Very Confident.

Before workshop						After workshop				
Not At All Confident		Very Confident				Not At All Confident		Very Confident		
1	2	3	4	5		1	2	3	4	5
36 22.2%	42 26.4%	47 26.9%	21 13.2%	13 8.2%	Write a food safety plan (n=159)	0 0%	4 2.5%	34 21.4%	78 49.1%	43 27.0%
28 17.6%	40 25.2%	45 28.3%	29 18.2%	17 10.7%	Conduct a food safety inspection (n=159)	0 0%	2 1.3%	21 13.2%	83 52.2%	53 33.3%
51 32.3%	39 24.7%	33 20.9%	23 14.6%	12 7.6%	Prepare for a third-party audit (n=158)	1 0.6%	6 3.8%	38 24.1%	69 43.7%	44 27.8%

For all three items, participants in the workshops indicated an increase in confidence regarding their skills. Those who were either confident or very confident in their ability to *write a food safety plan* increased from 21.4% before the workshop to 76.1% after the workshop (Figure 1). Across all workshops, participants from Lancaster had the lowest confidence in writing a food safety plan after the workshop, with only 57.1% confident or very confident in their ability.

Before the workshop, 28.9% were either confident or very confident that they could *conduct a food safety inspection*, which rose to 85.5% after the workshop (Figure 2). In terms of *preparing for a third-party audit*, 22.2% were either confident or very confident beforehand, which rose to 71.5% after the workshop. More than a quarter (28.5%) of the participants were still not confident in their ability to prepare for a third-party audit after the workshop (Figure 3). Chambersburg participants had the lowest confidence after the workshop at only 50.0%, while participants in the North East workshop had the highest confidence at 94.1% in their ability to prepare for a third-party audit.

Figure 1: Percentage of Participants Confident in Writing a Food Safety Plan

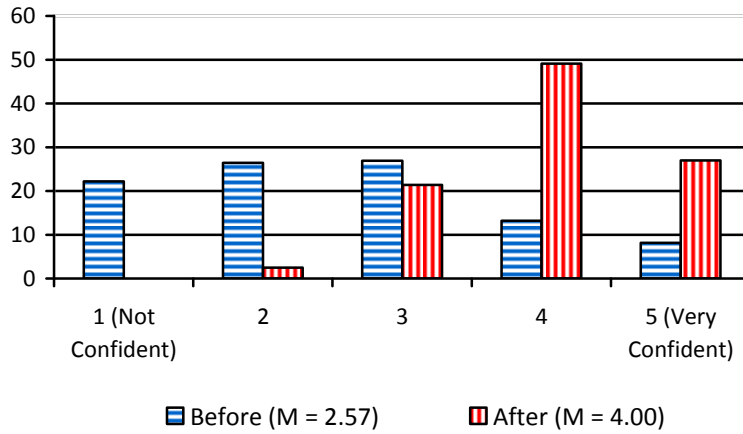


Figure 2: Percentage of Participants Confident in Conducting a Food Safety Inspection

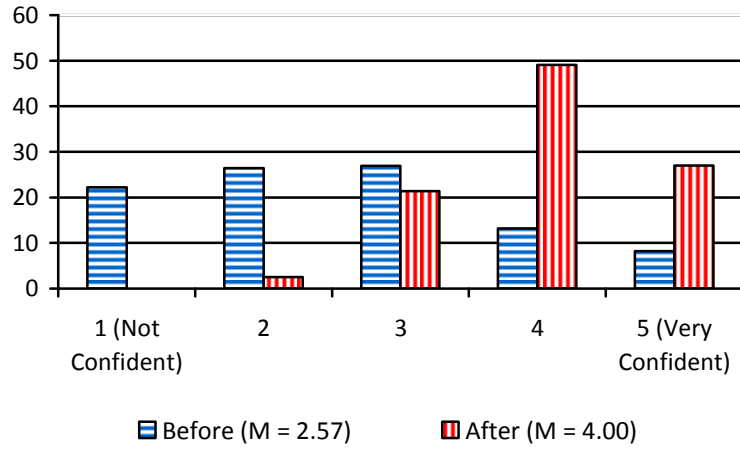
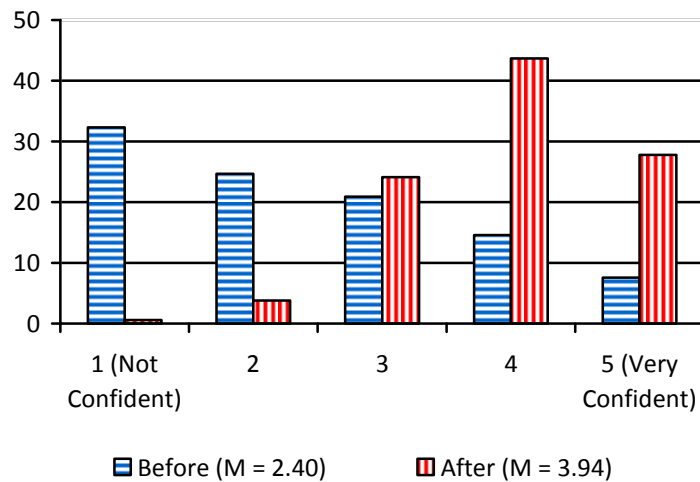


Figure 3: Percentage of Participants Confident in Preparing for a Third-Party Audit



3. Listed below are statements about food safety. Circle how much you agree with these issues. Use the scale 1 = Do Not Agree through 5 = Very Much Agree.

Before workshop						After workshop				
Do Not Agree		Very Much Agree				Do Not Agree		Very Much Agree		
1	2	3	4	5		1	2	3	4	5
2 1.3%	2 1.3%	11 6.9%	29 18.1%	116 72.5%	Farmers have a responsibility for the safety of produce coming off their farms (n=160)	0 0%	0 0%	3 1.9%	24 15.0%	133 83.1%
10 6.3%	3 1.9%	35 22.0%	56 35.2%	55 34.6%	Preparing for a food safety audit will help my farm maintain produce sales (n=159)	3 1.9%	2 1.3%	16 10.1%	55 34.6%	83 52.2%
3 2.5%	2 1.3%	13 8.2%	41 25.9%	98 62.0%	How consumers feel about the safety of my farm's produce affects how much produce my farm sells (n=158)	0 0%	2 1.3%	7 4.4%	36 22.8%	113 71.5%
28 17.7%	21 13.3%	57 36.1%	32 20.3%	20 12.7%	I have adequate resources to prepare for and pass a GAP audit (n=158)	0 0%	6 3.8%	27 17.7%	66 41.8%	59 37.3%

Except for the statement on having adequate resources, growers indicated a high degree of agreement with the statements even before the workshop. Specifically, most growers (90.6%) either slightly agreed or very much agreed with the statement about farmer responsibility before the workshop, which increased to 98.1% agreement after the workshop. Agreement with the statement regarding maintaining produce sales rose from 69.8% beforehand to 86.8% afterwards. For the statement regarding consumer perceptions, 87.9% of growers either slightly agreed or very much agreed beforehand, which increased to 94.3% afterwards. The final statement had the largest difference. Only one-third of the participants agreed that they had adequate resources before the workshop, which increased to 79.1% after the workshop. At only 61.1%, agreement of Chambersburg participants with the statement regarding adequate resources was noticeably lower than at all other locations.

4. After the workshop, please check one answer for each activity.

How likely is it that you will:	Very Unlikely	Unlikely	Undecided	Likely	Very Likely	Already Done
a. Write a food safety plan for the coming growing season? (n=153)	5 3.3%	10 6.5%	25 16.3%	43 30.7%	49 32.0%	17 11.1%
b. Conduct a self-audit for the coming growing season? (n=155)	5 3.2%	7 4.5%	26 16.1%	61 39.4%	51 32.9%	6 3.9%
c. Apply for a third-party audit for the coming growing season? (n=154)	33 21.4%	31 20.1%	45 29.2%	13 8.4%	26 16.9%	6 3.9%

The majority of growers indicated that they would take initial steps to implement and document GAPs for the coming growing season but most were not yet ready to apply for a third-party audit. In terms of *writing a food safety plan*, 62.7% indicated that they were either likely or very likely to do so. Mifflinburg participants indicated the lowest likelihood to write a food safety plan at only 36.0%, although eight Mifflinburg participants (32.0%) had already done so, the highest percentage among all locations. In terms of *conducting a self-audit*, 72.3% were either likely or very likely to do so. Less than 60.0% of participants indicated that they were likely to conduct a self-audit in both the Lancaster (54.6%) and Altoona (58.4%) workshops. Among all participants, only one-fourth (25.3%) were likely to *apply for a third-party audit*, while 44.5% were either unlikely or very unlikely to do so. Less than 10.0% of growers were likely to apply for a third-party audit in the Chambersburg (6.7%) and Altoona (8.3%) locations. The highest percentages of growers likely to apply for a third-party audit occurred among the Dupont (41.2%) and Mifflinburg (40.0%) participants. Among those who had already completed one of these three tasks, 11.1% had already written a food safety plan while only 3.9% of growers had either conducted a self-audit or applied for a third-party audit.

Below are a few questions about you and your farm. Check the responses that best describe your operation.

5. Which of the following describes your operation? Check all that apply.

	Yes	No
We pack harvested produce in the field for immediate delivery (n=170)	51 30.0%	119 70.0%
We send harvested produce to a buyer who packs it (n=170)	9 5.3%	161 94.7%
We grade and pack in our own packing house (n=170)	95 55.9%	75 44.1%
Other (n=169)	31 18.3%	138 81.7%

The most common operation among growers is to grade and pack their produce in their own packing houses, which indicates that future trainings should focus on GAP procedures such as post-harvest handling and hygiene in more detail. A minority of participants at the Altoona (46.7%) and Lancaster (43.5%) workshops grade and pack in their own packing houses. For the other workshops, the majority of growers grade and pack in their own packing houses. Among the other types of operations mentioned by growers were roadside stands, farmers' markets, sales to cooperatives, cooperative packing houses, tomato brokerage/repackaging/distribution, pick your own schemes, grading and packing in a rental facility, and fresh cut fruit processing.

6. What percentage of your fruit/vegetable sales is direct to supermarkets, restaurants, and/or consumers? (n=150)

Less than 50%	34 22.7%
50% or More	107 71.3%
Unsure	9 6.0%

7. For the following statements, check the responses that apply to your business. Check all that apply (n=163).

	Yes	No
I sell some or all of the produce I grow WITHIN my state.	126 77.3%	37 22.7%
I sell some or all of the produce I grow to places in OTHER states that are CLOSER than 275 miles to my farm.	38 23.3%	125 76.7%
I sell some or all of the produce I grow to places in OTHER states that are FARTHER AWAY than 275 miles from my farm.	10 6.1%	152 93.3%
I sell produce others have grown in addition to what I have grown.	50 30.7%	113 69.3%

8. What was the gross value of your produce sales in 2010? (n=151)

Less than \$500,000	123 81.5%
\$500,000 or More	28 18.5%

Based on the results from the last three questions, many of the respondents will be exempt from the Food Safety Modernization Act. To qualify for exemption, growers must have annual gross sales less than \$500,000 and sell a majority of their produce to qualified end users within their own state or within 275 miles of their farm if selling interstate. Qualified end users are considered supermarkets, restaurants, or consumers to whom produce is directly sold. Although many growers will likely meet the exemption requirements, the legislation's regulations have not yet clarified how selling produce others have grown will be considered when determining exemption status. In addition, exemption from the federal law does not guarantee that growers' supermarket clients will not implement their own food safety policies that could require growers to provide evidence of GAP compliance. Depending on the food safety policies implemented by the supermarkets to which they sell, the certificate provided for participating in this training might supply some growers the evidence they will need to confirm GAP compliance.

9. Have you previously attended a farm food safety workshop? (n=151)

Yes	55 34.6%
No	104 65.4%

The majority of participants had not attended previous GAP workshops. The workshops with high percentages of growers who had received prior training were the North East (72.2%) and Mifflinburg (62.5%). These locations will need to ensure that they are attracting growers who have not yet participated in GAP programming. Of the 55 who had previously participated in a GAP workshop, 21 of them (38.1%) indicated that they had attended another Penn State Extension session. Another five (9.0%) indicated that they had attended programming by Cornell.

Implications:

The workshops were effective in increasing participants' confidence in their skills related to documenting their GAP practices, although more than one quarter (28.5%) still doubted their ability to prepare for a third-party audit after the workshops. The majority of growers also indicated their intentions to write a food safety plan and conduct a self-audit for the coming growing season but most do not intend to prepare for third-party certification (TPC). GAP certification, however, might not be a priority for most of these growers since many are likely to be exempt from the Food Safety Modernization Act. For exempted growers, their next steps related to GAPs will likely be determined by the food safety policies of the supermarkets to which they sell. Determining whether these exempted growers will need to prepare for TPC, therefore, remains to be seen.

The follow-up evaluation to be administered after the coming growing season will determine grower retention of knowledge, skills and attitudes, and will also document the follow-through of growers in writing a food safety plan, conducting a self-audit and applying for TPC. The results from the follow-up

evaluation will help indicate areas in which grower knowledge could improve. Initial findings from this evaluation suggest that less time needs to be spent on general GAP knowledge. However, the lower percentages (70.1% and under) of correct answers on the questions regarding manure-based compost and wild animals indicate that this material will need to be reinforced. Future workshops should dedicate more time to material related to preparing for GAP inspection and to developing a plan for traceability. In addition, because many growers pack their own produce, post-harvest handling is another important content area.

To maximize the impact of future workshops, Extension should consider developing two workshop tracks. As indicated by the results, the content of this workshop is an appropriate introduction for growers who have never participated in a GAP workshop. For growers who have already had training and continue to seek information, workshops or online modules with more in-depth material on GAP standards and the GAP audit process will be important.

On-farm food safety will likely continue to affect Pennsylvania produce growers. Penn State Extension will therefore need to continue to offer educational programming on GAPs to fresh produce growers. Consistently evaluating the GAP programming will help Penn State Extension ensure that the program content and delivery is relevant and responsive to grower needs.