

Preparing Small and Very Small Meat and Poultry Establishments for the Future of HACCP: A Cooperative Approach



A white paper addressing the training, information and technical assistance needs of small and very small processors with recommendations for regulators, academia and the industry.

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Executive summary

In 1996, the United States Department of Agriculture Food Safety Inspection Service (FSIS) enacted the Pathogen Reduction Act/Hazard Analysis Critical Control Point (HACCP) Rule, beginning the transformation to an inspection/food safety system that focused on the reduction, minimization or elimination of pathogenic organisms. Since the rule was enacted, it has been enhanced by a supplemental series of FSIS regulations and rules including those addressing *Escherichia coli* O157:H7 and *Listeria monocytogenes* (1).

However, foodborne illness continues to be a significant health issue (2). And, while these regulations and policies have resulted in some reduction of outbreaks related to pathogens commonly found in meat and poultry (3), a review of foodborne illness statistics (4), and recalls (4), indicate that there is still room for improvement. FSIS continues to take administrative actions in plants with deficiencies in sanitation and HACCP programs (5) demonstrating the need for additional and ongoing training opportunities for processors of meat and poultry.

The University of Connecticut and the Pennsylvania State University sought to study the issue of meat and poultry food processor education with a 2006 grant proposal to the National Integrated Food Safety Initiative (NIFSI). The funded project aims to determine and address the training and information needs of small and very small processors in the northeast. FSIS saw this NIFSI submission as an opportunity to further inform the agency of the needs of small and very small meat and poultry processing plants. The agency provided additional funds to support a national meeting bringing together processors, academics and regulators. Consequently, project collaborators conducted three needs assessment activities to fulfill project goals.

- A mail survey of small and very small meat and poultry processing plants in the northeast which included a training needs assessment and a Pathogen Reduction/ HACCP program knowledge assessment,
- an email survey of individuals (academia, consultants, etc.) providing training, information, and technical assistance to small and very small meat and poultry processors, and
- a meeting, national in scope and participation, to elicit information from processors, academics and regulators regarding HACCP plan training and implementation, how to inform the industry about new Regulations/ Directives/Notices and the availability, need, and application of scientific/technical assistance.

The information generated from the three components of this project were analyzed and reviewed, resulting in recommendations made to FSIS/State inspection programs; academics and others who provide training and technical assistance; and the industry, all partners critical to the success of the Pathogen Reduction/HACCP program. These recommendations propose a total of 19 approaches to improving the way information is communicated to processors; how and where training is provided; and how and when training materials are developed. In addition the recommendations emphasize the importance of seeking out and making use of the programs and assistance provided.

Employing these approaches will improve the dissemination of information, provide standardized, high quality training programs and ultimately serve to enhance the ability of small and very small plant personnel to manage their HACCP programs effectively and successfully.



Introduction

Acknowledgements

The success of a project of this nature requires the help and cooperation of many people. We would like to thank Karlease Kelly and Jan Singleton for offering us the opportunity and making the United States Department of Agriculture(USDA)/Cooperative State Research, Education and Extension service (CSREES) funding available for the project in general and the national meeting addressing the information and training needs of small and very small meat and poultry processing operations. In addition, we would like to acknowledge the collaboration of Lori Pivarnik, University of Rhode Island; Todd Pritchard, University of Vermont; Don Schaffner, Rutgers University; Kerri Harris, International HACCP Alliance; Jay Wenther, American Association of Meat Processors; and Margaret Hardin, Texas A & M University during the planning of the meeting, conducting the meeting and developing this publication. Robert Gable was an essential team player, responsible for helping to develop the industry survey and analyze the results. Staff from the Pennsylvania State University (Lenny Pollack, Anne Christo-Baker, Brynn Rousselin) and the University of Connecticut (Wanda Hamilton) also deserve mention for their invaluable roll in this accomplishment.

Of course we would be remiss if we did not express our appreciation to the many representatives of government, academia, and industry who participated in the surveys and the informational meeting. Their input informed us and drove the recommendations we send along to state and federal (Food Safety Inspection Service [FSIS]) regulators, academia and to industry associations with interest in improving the provision of food safety and Hazard Analysis Critical Control Point (HACCP) information and training to the meat and poultry industry.

Description of the Situation

Foodborne illness continues to be a significant health issue in this country (2). And meat and poultry products are common vehicles for foodborne microorganisms. From 1967 to 1996, FSIS began to focus more of its resources to the control of pathogens in meat and poultry (6). It was likely a combination of this effort and the 1992-1993 outbreak of foodborne illness attributed to *Escherichia coli* O157:H7 associated with undercooked hamburgers (7) served at a fast food restaurant that brought about the Pathogen Reduction Act/HACCP Rule in 1996. This rule began the transformation to an inspection/food safety system that focused on the reduction, minimization or elimination of pathogenic organisms.

Implementation of the Pathogen Reduction Act/HACCP rule in 1996 resulted in improvements in the safety of meat and poultry. This improvement has been enhanced by the supplemental series of recommendations by FSIS beginning in 2002(1). These recommendations include the reexamination by beef plants with respect to potential *E. coli* O157:H7 contamination of their products as well as the rule to enhance control of *Listeria monocytogenes* in ready-to-eat foods. A report released by the Centers for Disease Control and Prevention (CDC) compared estimated incidence of several infections in 2004 with 1996-1998 (3). From 1998-2004, the estimated incidence of infections from *E. coli* O157:H7 decreased 42% and *Listeria* decreased 40% (3). Julie Geberding, CDC Director, stated that, "This report is good news for Americans and underscores the importance of investments in food safety. Our efforts are working...(6)."

However, statements in recent reports by the Centers for Disease Control (CDC) and the Center for Science in the Public Interest (CSPI) agree that while improvements in the food safety picture for the meat and poultry industry are commendable, there is still need for additional progress (3, 4). CDC reported that even with a decrease in foodborne illness, enhanced efforts are needed to understand and control pathogens, reduce and/or prevent contamination during processing (5).

In the ninth edition of their publication, *Outbreak Alert*, CSPI reviewed outbreak data from a variety of sources. In that report, from 1990 to 2006, poultry ranked third and beef ranked fourth of all food categories linked to foodborne illness outbreaks (4). In 2008, there were 53 product recalls from FSIS inspected plants. Of these, 14 were due to presence of *Listeria monocytogenes* and 19 were due to the presence of *E. coli* O157:H7. From February to August of 2008, almost 1.5 billion pounds of ground beef were recalled due to the presence of *E. coli* O157:H7 (3). In addition, six recalls resulted from undeclared allergens and four from foreign material (8).

A review of enforcement statistics detailed in reports by the General Accounting Office (9) and FSIS (5) indicate that administrative actions continue to be taken due to deficiencies in sanitation and HACCP programs, particularly in small and very small plants. In 2008, there were a total of 1034 administrative actions in sanitation and HACCP programs by FSIS. Eighty-seven percent of these actions were attributed to small and very small plants (5). This finding supports the need for additional and ongoing training opportunities. [Note: small plants are defined as having at least 10, but not more than 500 employees; very small plants are defined as having fewer than 10 employees or annual sales of less than \$2.5 million on January 25, 2000. Approximately 84% of the total plants are small and very small.]

In 1997, the National Advisory Committee on Microbiological Criteria for Foods (NACMCF) revised the 1992 HACCP document and included a new section on education and training emphasizing “effective training” as “an important prerequisite to successful implementation of a HACCP plan (10).” Then, in 2002, Thomas J. Billy, of FSIS, stated that HACCP was a work in progress and that next steps need to include training and education (after implementation of the regulation). He stated that “Training and education needs to be focused more on the scientific rationale for regulatory decisions and we need to explore certification programs for food safety workers including FSIS and industry employees (11).”

In January, 2000, the United States Public Health Service (USPHS) in consultation with many scientists and health experts released the Healthy People 2010 health objectives for the nation to achieve over the first decade of the new century (12). The Food Safety focus area of these objectives sought to decrease the rate of diseases caused by microorganisms transmitted mainly by food, such as *Salmonella* and *Campylobacter*. Specific objectives support tracking new and total cases of the most common food pathogen diseases and making food safety education a primary area of emphasis. In the mid-course assessment of the food safety goals of Healthy People 2010, the USPHS emphasized that it will take a variety of strategies, starting with HACCP and continuing with the proposed revision of the U.S. Food and Drug Administration’s (FDA) Good Manufacturing Practices regulations, education of food processors, and other efforts to ensure that improvements continue (13).

Establishments will also have to enhance their food systems, apply new technologies as they become available, and increase testing as a way to assess progress.

The University of Connecticut and the Pennsylvania State University sought to study the issue of meat and poultry food processor education with a 2006 grant proposal to the National Integrated Food Safety Initiative. The funded project aims to determine and address the training and information needs of small and very small processors in the northeast. A survey was developed and administered to plants in the northeast. Responses were received and analyzed from 301 plants.

With two documents already published regarding regulatory compliance and outreach, Strategic Plan for Improving Small and Very Small Establishments' Food Safety Programs to Further Protect Public Health and Ensure Regulatory Compliance (14) by the International HACCP Alliance and the FSIS Strategic Implementation Plan for Strengthening Small and Very Small Plant Outreach (15), FSIS saw this National Integrated Food Safety Initiative (NIFSI) submission as an opportunity to further inform the agency of the needs of small and very small meat and poultry processing plants. The agency provided additional funds to the project directors to fund a national meeting bringing together processors, academics and regulators.

The additional funding enabled project directors to conduct both an email survey of individuals (academia, consultants, etc.) providing training, information, and technical assistance to small and very small meat and poultry processors and a meeting, national in scope and participation, held April 30, 2008 in Philadelphia, Pennsylvania. At the meeting, processors, academics, and regulators gathered to consider the answers to sets of questions addressing the following:

- HACCP plan training and implementation
- Informing the industry about new Regulations/Directives/Notices
- The availability, need, and application of scientific/technical assistance

This document summarizes the outcomes of the national meeting, the email survey and the survey of processors doing business in nine northeast states. The document also includes a set of recommendations are made to FSIS and state regulators, academics providing services to meat and poultry processors, and to the industry.



Email survey of training/information providers: Summary of findings

An email survey using Zoomerang® (16) was sent to all persons listed as FSIS small plant contacts and coordinators, identified consultants, and identified Cooperative Extension food safety/food science/meat science specialists. Email recipients who were not providing education and/or information to small and very small meat and poultry processors were asked to forward the survey to others who met the criteria to complete the survey. Two hundred and thirty two (232) were sent, 85 were returned, and 83 were considered in the survey results (a return rate of 35.8%). Survey results are available in Appendix A.

Almost half of the respondents were from colleges/universities while 32% associated themselves specifically with Cooperative Extension. Fifty five percent (55%) were FSIS small plant program coordinators and/or contacts. The academic expertise of respondents included: food safety (92%), HACCP (90%), food science (82%), microbiology (75%), sanitation (76%), and food processing/engineering (60%). Respondents indicated that they obtain updated information from the FSIS website and that they value information provided through FSIS mailings.

Training and consulting provided

When asked about training programs they provide, 72 responded. Forty six (46) of the respondents (64%) provide HACCP training that is meat and poultry specific. Eleven individuals or 15% conduct generic HACCP training. Forty (87%) of these 46 respondents who provide HACCP training also conduct basic HACCP courses, while some provide additional workshops that focus on sanitation (59%), *E. coli/Listeria* (52%), microbiology (37%), process validation (35%), biosecurity and recall procedures (17%) and traceback (9%). Training is provided by most respondents one to four times per year. Thirty one (31) or 67% of these training programs are approved by the International HACCP Alliance.

Of the 72 respondents that provide information and/or training, 33 (46%) consult on HACCP plan development and implementation, 29 (40%) on process validation, and 28 (39%) on pathogen detection and control.

Training tools and materials

Most respondents (89%) develop their own training materials using power point presentations, notebooks, manuals and small group sessions. When questioned about what materials they would find to be most useful, respondents were looking for updated model plans, information on process validation, sample record keeping forms and resources for pathogen detection and control. Fifty percent or more reported that they would find training manuals, videos, and power point presentations useful. However, few reported the need for web-based training programs.

Comments made by training survey participants:

Relating to special concerns of small processors:

- Training and support for small plants is woefully inadequate. That fact is not all the fault of FSIS: it is extremely difficult for very small processors to keep up to date with HACCP regulations, to develop and implement meaningful HACCP plans, and to adequately validate and document their plans.

- FSIS training and training materials have not successfully targeted small producers.
- We cannot reach everyone and some small processors do not seek help from Extension.

Relating to training materials:

- It would be beneficial to have training manuals provided so that everyone is teaching the same information. This approach has worked well for the National Seafood HACCP Alliance training.
- Supporting documentation needs to be easy to find, readily accessible, and understandable. For example, when someone wants to put product in a cooler to chill it down they don't need a 50 page study or an advanced degree in risk assessment or microbiological modeling, they just need to know the bottom line - what is acceptable and what is not.

Relating to State Inspection programs:

- There are 28 state meat inspection programs that provide support in the areas covered in this survey. Most of the HACCP contacts for the 28 states that have state inspection are state inspection employees. Most of the state meat inspection programs provide more hands on training and assistance in regards to all aspects of inspection including food safety, HACCP and food defense to very small and small plants than does FSIS. Most state meat inspection programs have fostered a relationship with a University Extension Meat Specialist or Food Safety Specialist to design and implement programs that greatly assist very small and small meat plants.

Conclusions from the trainer/academic survey:

- Training and information are being provided by academics and those outside of an academic setting with academic background or professional training in subject matter that includes HACCP, food safety, food science, microbiology and sanitation.
- Most respondents who conduct training are only providing basic introductory HACCP courses.
- About two-thirds of those who provide basic HACCP training are using course material that has been approved by the International HACCP Alliance.
- Most respondents develop their own training materials (this may speak to a lack of training standardization).
- Respondents would value new, updated model plans; sample record keeping forms; training manuals, videos, and power point presentations.
- Respondents would appreciate more information and resources regarding process validation and pathogen detection and control.
- Consulting services are not widely available from respondents.



Mail survey of Northeast operations: Summary of findings

The HACCP Pathogen Reduction Regulation has been in place and implemented by very small plants for almost 10 years. Since the regulation was first promulgated, there have been many updates, changes and clarifications of the final rule. These changes and their associated implications make it very important that processors stay informed so that they remain current and in compliance. This survey was conducted to derive information from small and very small meat and poultry operation personnel from the New England States, New York, New Jersey, and Pennsylvania. In the northeast, the opportunities for training and resources for information are limited. It can be difficult for industry folks to find the information and training opportunities they need. In order to better address this limitation, we asked a representative from each of 1163 plants to complete a questionnaire so that the project cooperators could learn more about who the operators are; what they do; what training they are getting; what training they need, and how they get information about HACCP, food safety and sanitation. The survey was composed of three sections: Background Information (and demographics), a Training Needs Assessment, and a Knowledge Assessment. Survey respondents totaled 301, for a return rate of 26%.

Background information:

Plant description

Table 1 identifies the demographic characteristics of the survey population. All northeast project states were represented in the survey population. When asked what type of operation they represented (by FSIS definition of product type), the type of operation mentioned most frequently were raw, ground meat and poultry (55%), raw, not ground (43%), and fully cooked, not shelf stable meat and poultry products (39%). A significant portion of the respondents had been in business more than 20 years (74%), while 7% had been in business less than 6 years. Fifty two percent (52%) of these processors had 15 or fewer employees and 10% had more than 150 employees.

Employee language

When asked about the language spoken by plant employees, 44% replied that they had employees who did not speak English. Languages spoken by these employees included Spanish (81%), Portuguese (18%), Vietnamese and Hmong (11%) and Chinese (9%). Twenty percent spoke a variety of other languages including many Eastern European languages. It was thought by 65% of respondents that the non-English speaking employees would benefit from training materials in their native language.

Information sources

The major information source for this group is FSIS mailings such as notices, newsletters and news releases (83%), followed by the Enforcement, Investigations and Analysis Officer (EIAO) or other FSIS personnel (52%), and the FSIS website (41%). Only 23% reported that they get information from FSIS emails. About one third reported getting information from industry sources and 10% from University/Cooperative Extension sources.

When asked if they had seen specific FSIS published documents (all made available after implementation of the pathogen reduction rule), the responses indicated that processors may not be aware of these documents: 49% had not seen the 2005 Hazards Guide; 33% had not seen the *Listeria* Compliance Guide and 32% had not seen/attended the 2004 *E. coli* O157:H7 directives update and workshops. This finding is worthy of note when one considers that many of the respondents identified themselves as processors of either raw meat and fully cooked, not shelf stable products or ready to eat products.

Taking a basic HACCP course would provide processors with a fundamental understanding of the principles of HACCP and the role employees play in the success of a HACCP plan. Twelve percent (12%) of the respondents stated that no one in their plant had taken a basic HACCP course. A total of 33% had at least one trained employee, while 9% had 6 or more.

Table 1
Demographic characteristics of survey respondents ^a

	Frequency	Percent
Title that best describes position (n = 296)		
Owner	138	47
HACCP or Food Safety Manager	60	20
QC or QA Manager	59	20
Other	31	10
Shift Supervisor	8	3
State in which our operation is located (n = 299)		
New York	91	31
Pennsylvania	89	30
New Jersey	57	19
Massachusetts	28	9
Connecticut	16	5
Maine	7	2
New Hampshire	5	2
Vermont	4	1
Rhode Island	2	1
Type of operation, top 4 (Chose all that applied)		
Raw, ground meat and poultry	163	55
Slaughter operations, beef, pork, poultry, other ^b	147	50
Raw, not ground meat and poultry products including beef trimmings and mechanically tenderized meats	130	43
Fully cooked, not shelf-stable meat and poultry products	117	39

Table 1 (continued).

	Frequency	Percent
Years in business (<i>n</i> = 298)		
<1-5 years	20	7
6-10 years	19	6
11-15 years	19	6
16-20 years	20	7
>20	220	74
Total number of employees (<i>n</i> = 300)		
1-5 employees	66	26
6-15 employees	78	26
16-25 employees	32	11
26-50 employees	37	12
51-150 employees	58	19
Over 150 employees	29	10
Have employees who <i>do not</i> speak English (<i>n</i> = 299)		
Yes	131	44
No	168	56
Non-English speaking employees would benefit from training materials in their native language (<i>n</i> = 197)		
Yes	128	65
No	38	19
Don't know	31	16
Languages spoken by non-English speaking employees (chose all that applied)		
Spanish	145	81
Portuguese	31	18
Vietnamese, Hmong	20	11
Chinese	16	9
Other (French, Italian, Cambodian, Arabic, Somalian, Korean, Burmese, German, Greek, Nigerian, French Creole, Thai)	60	20
Number of employees who have taken a meat and poultry HACCP course (<i>n</i> = 290)		
none	36	12
1	96	33

Table 1 (continued).

	Frequency	Percent
Number of employees who have taken a meat and poultry HACCP course (n = 290), cont.		
2	64	22
3	35	12
4	17	6
5	17	6
6 or more	25	9
Have you seen these documents or attended these events (chose all that applied)		
<i>The 2005 Hazards Guide</i>		
Yes	140	50
No	137	49
Does not apply	4	1
<i>May 2006 Listeria Compliance Guideline</i>		
Yes	166	57
No	97	33
Does not apply	29	10
<i>FSIS regulatory education sessions</i>		
Yes	149	52
No	128	45
Does not apply	9	3
<i>2004 E. coli O157:H7 directives update and workshops</i>		
Yes	168	58
No	92	32
Does not apply	28	10
Where do you routinely get information (chose all that applied)		
FSIS mailings ^a	247	83
EIAO or other FSIS personnel	155	52
FSIS website	122	41
Industry/trade associations	94	31
FSIS e-mail	68	23
Consultants	64	21
University/Cooperative Extension	30	10

^a See appendix for additional demographic results^b Includes beef (45), pork(43), poultry(18), other(41)

Training Needs Assessment

This section of the survey is designed to assess where industry personnel are getting training information, who is doing the training, what training programs are available and used by the industry in the region, and how industry would prefer to meet its training needs including the subject matter to be addressed and what methods of training delivery they would prefer.

Table 4 describes responses concerning the need for training, in-plant training resources and opportunities for off-site training. Training is viewed as important to 65% of respondents and 52% have an established training program in their operation. Those that do not have a training program report that they have no time for training (49%), no funds to pay the cost of training (45%), no resources to support training (32%) and that they do not need training (25%).

If training is provided within an operation, the person with responsibility for training is likely to be the survey respondent (75%). [Note: Forty percent (40%) of respondents identified themselves as HACCP/food safety/or Quality Assurance (QA) managers, 47% as owners]. Others with training responsibility include Quality Control (QC)/HACCP personnel (37%) and other supervisory personnel (16%). It should be noted that, when asked what type of formal training the trainers had, most cited a HACCP course (92%) followed by a sanitation course (50%). Only 23% had undergraduate and 16% had graduate university training. About half of the plant employees had attended off-site workshops. The most likely providers of these workshops were regulatory agencies (55%), industry trade associations (54%) and university/extension programs (46%).

Table 2
Training needs assessment

	Frequency	Percent
Regular training is important to the success of your HACCP plan (<i>n</i> = 300)		
Very important	196	65
Somewhat important	85	28
Not important	19	6
Have an established training program in your operation (<i>n</i> = 300)		
Yes	155	52
No	145	48
What keeps you from providing training in your operation, top 4 (chose all that applied) (<i>n</i> = 145)		
No time for training	68	49
No funds to pay the cost of training	63	45
No resources to support training	44	32
Do not need training	35	25

(Appendix contains additional choices.)

Table 2 (continued).

	Frequency	Percent
Who has responsibility for training in your operation (chose all that applied)		
Myself	168	75
Quality control/HACCP personnel	82	37
Other supervisory personnel	55	25
Outside consultants or trainers	35	16
University/Extension personnel	4	2
Type of formal training that trainer has (chose all that applied) (<i>n</i> = 171)		
HACCP Course	165	92
Sanitation course	90	50
Industry training	73	41
Professional development	46	26
Undergraduate	41	23
Graduate training	28	16
Attend workshops offered by off-site provider (<i>n</i> = 296)		
Yes	137	46
No	159	54
Who was the provider of the off-site workshop (chose all that applied) (<i>n</i> = 144)		
Regulatory agency	80	55
Industry trade organization	78	54
University/extension	65	46
Consultant	29	20
Access to computer at work for educational purposes (<i>n</i> = 226)		
Yes	175	77
No	49	22
Don't know	2	1
Computers at work offer the following (percentage replying "yes") (chose all that applied) (<i>n</i> = 195)		
Windows operating system	189	96
CD-Rom drive	184	94
Access to the Internet	187	93
An established e-mail account	178	93

Table 2 (continued).

	Frequency	Percent
Computers at work offer the following (percentage replying “yes”), cont.		
DVD drive	151	84
Floppy disk drive	115	66
MAC operating system	5	4
Type of Internet connection (n = 196)		
Cable, high speed	64	33
DSL	61	31
T1	30	15
Phone line with dial up	16	8
Don't know	12	6
High speed dial up	7	4
Other	6	3

The internet and web-based information systems are considered to be state of the art vehicles for communication and education. When asked, 77% replied that there is a computer at the plant available for educational purposes. Of those with computers, the Windows operating system is available on 96% of the computers. In addition, computers at the work site offer access to the internet (93%), an email account (93%), and a CD-Rom drive (94%) or DVD drive (84%).

In an effort to determine what training plant operators need, 26 topics were suggested.

The topics receiving the most interest were (Table 3):

- 1) HACCP regulation updates
- 2) Detection and control of pathogens
- 3) Cleaning and sanitation
- 4) Good Manufacturing Practices (GMPs)
- 5) *E. coli* regulations
- 6) Validation of processes
- 7) Record keeping
- 8) Labeling
- 9) Process controls and CCP identification, and
- 10) *Listeria* regulations

Table 3
Top ten training topics requested, in order of interest

Item/Topic	% not interested	% Somewhat interested	% Very interested
HACCP regulation updates	15	40	45
Detection and control of pathogens	20	39	41
Cleaning and sanitation	20	40	40
Good Manufacturing Practices	22	39	39
<i>E. coli</i> regulations	24	35	41
Validation of processes	25	44	31
Record keeping	25	45	30
Labeling	26	49	25
Process controls and CCP identification	27	41	32
<i>Listeria</i> regulations	28	36	36

(Appendix contains additional choices.)

When asked how respondents liked to receive training and information (Table 4), use of internet/web based vehicles such as CDs or DVDs, web-based or internet training ranked in the top six. However, the preferred method was printed brochures/fact sheets/newsletters. Respondents were also interested in getting their training and information via videotapes, print-based correspondence/independent study courses and off-site training.

Table 4
Top six preferences for how respondents would like to receive training and information

Item/method	% not interested	% Somewhat interested	% Very interested
Printed brochures/fact sheets/newsletters	12	37	51
CD-ROM or DVD	17	38	45
Web-based/internet	23	34	43
Videotapes	23	39	38
Correspondence/independent study (print based)	25	42	33
Off-site training: in-state	28	38	34

(Appendix contains additional choices.)

Knowledge Assessment

This section of the survey was designed to assess baseline knowledge of HACCP principles, food borne illness as it relates to microbial contamination in general and in the meat and poultry industry, safe food handling/processing practices, pathogen testing programs, good manufacturing practices and sanitation practices.

Table 5 contains the ranked order of knowledge responses low to high by correct answers. Shaded scores indicate the correct responses. For this study, the standard for subject mastery was set at 80%, based on the difficulty of the subject matter (17). There were 45 statements in five categories. For all categories the mean percent correct was 63% (Table 6). The study population did not achieve mastery in any of the five categories. Thirty three of the 45 statements were below mastery. In two of the categories, Prerequisite Programs and Preliminary Steps and Pathogen Reduction/Testing, none of the statements met mastery. For the HACCP Plan category, 50% of the statements met mastery.

Table 5
Survey Knowledge Responses in Ranked Order within Categories from Low to High by Correct Answer
(N=301)

Survey Statements by Category	Disagree	Agree	Don't Know
	Mean (%)*		
The Pathogen Reduction/HACCP Regulation			
HACCP plans are approved by FSIS before implementation.	45	53	2
State inspected meat processing operations are exempt for the HACCP Pathogen Reduction rule.	56	9	35
It is the processor's responsibility to learn about amendments or changes to the HACCP Pathogen Reduction regulation	32	60	8
Processors do not need to know about FSIS guidance documents since guidance is not considered part of the Regulation	72	9	19
SSOP procedures must be in place before HAACCP program is implemented.	4	93	3
Prerequisite programs and preliminary steps			
Written GMPs must be included in a HACCP plan.	51	40	9
SSOPs only address employee hygiene and sanitary operations.	61	35	4
The HACCP Regulation requires that each establishment describe in writing all standard sanitation procedures that will be conducted.	26	71	3
All SSOP plans must have written corrective actions.	23	73	4
Since sanitation is considered a standard operating procedure for the facility, you do not need to keep a written sanitation record.	74	22	4
Flow diagrams should be written and verified fro each product the plant produces.	20	77	3

Table 5 (continued).

Survey Statements by Category	Disagree	Agree	Don't Know
	Mean (%)*		
HACCP Plan			
Chemical hazards such as lubricants, pesticides and sanitizers are addressed in the HACCP plan.	17	79	4
The absence of pathogens is a good example of a Critical Limit used to monitor a kill step in your process.	25	53	22
Corrective Action Plans are written when a processing problem or deviation is first detected by the person monitoring the CCP.	25	73	2
All HACCP records for fresh meat and poultry must be kept for 2 years.	31	54	15
All CCP monitoring activities must be performed by a HACCP trained individual.	51	47	2
A HACCP plan does not need to consider how a product will be handled during distribution.	68	27	5
A single CCP may be used to control for several hazards.	28	68	4
If a critical limit is not reached during the process, the product must be assessed to determine if it is safe.	20	77	3
A Hazard Analysis does not address non-meat or non-poultry ingredients.	80	14	6
There is no need to conduct your own hazard analysis if your product is produced the same way as a USDA/FSIS model plan.	84	12	4
Each processing step must undergo Hazard Analysis for chemical, physical and biological hazards.	11	85	4
A CCP is the point in the process where if a significant food safety hazard is not controlled, an unacceptable consumer health risk could result.	7	90	3
It is best to use a pencil for HACCP monitoring records so that it can be changed if needed.	91	6	3
A HACCP plan must identify what will be monitored at the CCP, who will do it, how it will be done and how often.	5	93	2
A hazard analysis, HACCP Plan, and validation documents are part of your HACCP records.	5	94	1

Table 5 (continued).

Survey Statements by Category	Disagree	Agree	Don't Know
	Mean (%)*		
HACCP Plan, cont'd			
Measuring the internal temperature of a product is one way to monitor a CCP.	3	95	2
Pathogen Reduction/Testing			
All processors must assess their product and process for <i>E. coli</i> O157:H7 and <i>Listeria</i> .	19	73	8
<i>E. coli</i> O157:H7 is the best indicator of contamination with feces.	28	53	19
Failure to meet <i>Salmonella</i> testing standards means that an operation is failing to maintain an adequate HACCP plan.	43	44	13
All raw meat and poultry processors are required to have a plan for monitoring <i>Salmonella</i> .	44	39	17
Deli meats and frankfurters are the two foods that pose the greatest risk for contamination with <i>L. monocytogenes</i> .	16	64	20
FSIS considers <i>E. coli</i> O157:H7 to be a food adulterant.	15	68	17
Strict sanitation and environmental monitoring of <i>L. monocytogenes</i> is an acceptable way for processors to meet the requirements of the <i>Listeria</i> regulation.	10	71	19
FSIS is free to take samples for microbiological testing at their discretion.	18	75	7
<i>Listeria</i> is a problem because it can grow at refrigerator temperatures.	9	75	16
Once ready-to-eat foods are cooked, <i>L. monocytogenes</i> contamination will no longer be a problem for the processor.	79	9	12

Table 5 (continued).

Survey Statements by Category	Disagree	Agree	Don't Know
	Mean (%)*		
Validation, Verification and Reassessment			
Scientific evidence of a new <i>Listeria</i> control process can be used to validate the use of that process for any ready to eat product.	11	50	39
Pre-shipment record review meets all record review requirements of the HACCP regulation.	29	65	6
A process authority can help you to develop information that will validate a unique or new process.	6	65	29
The USDA compliance guideline for cooling and stabilization may be used to validate a plant's cooling process.	10	70	20
A pre-shipment review can only be conducted just prior to shipping.	70	26	4
Microbiological testing may be used to verify that the HACCP plan is effective.	7	82	11
A HACCP plan must be reassessed annually and whenever there is a change in equipment, raw materials or product formulation.	9	90	1
Verification includes regularly scheduled activities that insure the HACCP plan is being followed.	4	92	4

* **Shaded scores indicate percent correct answers.**

Comparing Training Assessment responses to knowledge responses, size of plant and years in business

When comparing training assessment responses to knowledge responses, those who perceived training as very important to the success of HACCP, had higher total scores on the knowledge assessment (65%) than those who thought training was somewhat or not important (59%). Those who have an established training program had higher scores (66%) than those who did not (60%). Those who attended workshops by off-site providers had higher scores (68%) than those who did not (60%).

Table 6
Comparison of total knowledge responses to training assessment categories

Training Assessment Categories	Number of Respondents	Knowledge* Percent Correct
Perceived importance of training to success of HACCP plan (n = 300)		
<i>Not important</i>	19	59
<i>Somewhat important</i>	85	59 ^a
<i>Very important</i>	196	65 ^b
Have an established training program		
<i>YES</i>	155	66 ^a
<i>NO</i>	145	60 ^b
Have access to a computer for educational purposes		
<i>YES</i>	175	65 ^a
<i>NO</i>	49	62 ^b
Attend workshops by off-site provider		
<i>YES</i>	137	68 ^a
<i>NO</i>	159	60 ^b

* Percent correct followed by different letters (a, b) indicate the percents are significantly different at the $p < .05$ level for each category.

Some valuable information is elucidated when comparing size of plant to training assessment category responses and knowledge assessment responses (Table 7). Respondents from plants with 5 or fewer employees scored lowest on the knowledge assessment (60%), while plants with more than 150 employees scored highest (70%). Generally, scores increased with size of plant. Respondents from larger plants tend to state that training is of higher importance, have an established training program, give their employees greater access to a computer at work, and attend more workshops by off-site providers.

Table 7
Comparison of size of plant to training assessment categories

Size of Plant						
	1-5	6-15	16-25	26-50	51-150	>150
Perceived importance of training (n = 300)						
Not important	21% 14 ^a	4% 3	3% 1	3% 1	0% 0	0% 0
Somewhat important	39% 26	43% 34	41% 13	16% 6	9% 5	3% 1
Very important	40% 26	53% 4	56% 18	81% 30	91% 53	97% 28
Having an established training program (n = 300)						
Yes	32% 21 ^a	37% 29	38% 12	67% 25	71% 41	93% 27
No	68% 45	63% 49	62% 20	32% 12	29% 17	7% 2
Access to a computer at work for educational purposes (n = 226)						
Yes	54% 21 ^a	62% 33	91% 19	91% 29	88% 46	93% 27
No	46% 18	36% 19	10% 2	9% 3	10% 5	7% 2
Don't know	0% 0	2% 1	0% 0	0% 0	2% 1	0% 0
Attend workshops by off-site provider (n = 296)						
Yes	22% 14 ^a	30% 23	39% 12	54% 20	76% 44	83% 24
No	78% 50	70% 54	61% 19	46% 17	24% 14	17% 5

^a Number of respondents

The number of years in business was correlated with training assessment categories (Table 8). Plants that were in business for fewer years were more likely to perceive training as very important and those in business for less than 6 years were more likely to have an established training program. Plants in business less than 16 years were more likely to have a computer available for educational purposes. However, newer plants (< 6 years and 11-15 years) were less likely to attend workshops by off-site providers.

Table 8
Comparison of years in business and training assessment categories

Years in business					
	<6 years	6-10	11-15	16-20	>20
Perceived importance of training (n = 297)					
Not important	0% 0 ^a	0% 0	5% 1	0% 0	8% 18
Somewhat important	25% 5	21% 4	42% 8	32% 6	27% 60
Very important	75% 15	79% 15	53% 10	68% 13	65% 142
Having an established training program (n = 297)					
Yes	70% 14 ^a	37% 7	42% 8	42% 8	53% 116
No	30% 6	63% 12	58% 11	58% 11	47% 104
Access to a computer at work for educational purposes (n = 223)					
Yes	82% 14 ^a	81% 13	85% 11	73% 11	76% 124
No	18% 3	13% 2	15% 2	27% 4	23% 37
Don't know	0%	6% 1	0%	0%	1% 1

^a Number of respondents

Conclusions from the industry survey:

- For the total study population, knowledge percent correct was below the standard of 80% correct.
- Plant size is important. Respondents from larger plants have higher knowledge scores, are more likely to say training is important, more likely to have a training program, more likely to have computer access for training and are more likely to attend workshops off-site. This observation may be particularly evident in plants with more than 25 employees.

- Forty eight percent (48%) of respondents have fewer than 15 employees; 10% have more than 150 employees
- Years in business are important. Respondents from newer plants see training as important and are more likely to have a training program. Seventy four percent (74%) of respondents have been in business more than 20 years.
- For all plants, the reasons most often given for not providing training are not enough funds and not enough time.
- Knowledge scores are higher when training is perceived as important, there is an established training program, there is computer access for training and respondents attend workshops by off-site providers.
- NJ and PA are more likely to reply that university/extension and industry were providing the most training workshops. NY, NJ, ME, NH and VT also cite regulatory agencies as an important source of training workshops.
- There is a need for training materials in languages other than English, especially Spanish.
- Approximately half of plant personnel are not aware of the availability of important FSIS guidance documents or training events for small and very small plants.



National working meeting: Summary of findings

FSIS asked the project team to elicit national input that would guide the development of effective outreach and educational programs for small and very small meat and poultry processors operating under HACCP. To that end, a meeting attended by small and very small meat and poultry industry personnel and regulatory and academic partners who provide training, information and technical support to the industry was held in Philadelphia in April, 2008. Participants represented 20 states from Maine to Washington, from Louisiana to Wisconsin. Included were states with few resources for training and technical support and states with large university extension program in animal and food sciences. Regulators from state inspection programs joined colleagues from FSIS.

The goal of the meeting was to develop plans and make recommendations for training materials and the availability of practical resources to improve the transfer of information from the USDA/FSIS and academic institutions to the small and very small meat and poultry establishments.

Participants were apprised of results of the industry survey and the survey of training and information providers. They were updated on current FSIS efforts by Karlease Kelly, FSIS Office of Outreach, Employee Education and Training. Meeting organizers then gave participants their charge for the working sessions of the meeting.

Working sessions:

The working sessions were designed to record participants' thoughts, perceptions, and experiences related to a series of specific questions. Each session represented a forum for exchanging perspectives among people with a broad range of roles and experiences. Participants were encouraged to tell their stories and share their opinions. Comments expressed by participants were recorded without identifying the names of the individuals. Summaries of the working sessions were compiled in a way that protected the anonymity of the participants in the session. With regard to training, information and technical support, the meeting planning team wanted to know: what has been done; what can be adapted for use on a regional or national level; and what needs to be done.

Participants were assigned to one of three working sessions with academic, regulatory and industry groups divided equally among the groups. Working groups included:

Group I: HACCP Plan training and implementation: Basics and beyond

Group II: New regulations/guidance/policy: Informing the industry

Group III: Scientific/Technical assistance: Availability, need, and application

Summary statements from group meetings

The summary statements that follow reflect actual opinions, statements and responses from participants in the group meetings.

A. Training

Basic HACCP training

The basic 2 day HACCP (most preferred the 2 day format to limit time away from the plant) course is generally considered to be a good introduction to HACCP by the participants. Most participants preferred the 2 day format to limit the time spent away from the plant. The participants recommended that the curricula for these courses needs to be updated and that the update should include model HACCP plans to reflect current thinking and regulatory changes since the Pathogen Reduction regulation was adopted. The participants noted that a combination of DVD and web based training with programs in small modules or segments would be useful. Operators often need additional (often individualized) help writing their plans beyond the basic course. Finally, the participants commented that training which allows processors and inspectors to be trained together could be beneficial. This could help to ensure that everyone gets the same message.

Training beyond the basics

The group reported that there are barriers to providing training beyond the basics of a 2 day course. Barriers cited were cost of training, time away from work and employee turnover. Participants noted that while training sometimes takes place in plants, it is often not documented. Members of the group reported that when training is done, it is usually provided by HACCP or QA/QC personnel. However, they offered that training beyond basic HACCP does not follow any standard curricula.

Some participants believe that FSIS inspectors should play a greater role in making sure that plants are operating appropriately, because the changes in HACCP implementation that are occurring relate to FSIS notices, directives, compliance guides and regulatory requirements. They suggest that inspectors could serve as trainers, but inspectors are not trained to do this. Participants were interested in further training addressing sanitation, *E. coli* O157:H7, new guidance and/or regulations, and verification/validation.

The group suggested that FSIS should cooperate with universities and trade associations to provide training. One member suggested that a system such as USDA AgLearn would be helpful. [Note: The Agricultural Learning Service or AgLearn is a learning management system that addressed the learning and training needs of USDA employees.]

Informing processors of training opportunities

Participants suggested that training opportunities should be communicated through inspection/FSIS staff: processors see them every day. Group members noted that it would be beneficial if university/extension programs offering training sent notices to FSIS and all licensed plants: the new outreach program of FSIS could help with this approach. Several participants stressed that the internet is not an effective way to reach *all* plant operators.

Availability/cost of training

The working group wanted local basic meat and poultry training available to everyone.

They noted that training opportunities are not uniformly accessible to plant operators in all regions of the country. Local training (within the state) is not available to all processors.

Participants noted that some states do not have the resources to provide even basic training. It was reported that in the northeast for example, the only basic meat and poultry HACCP courses are offered at the University of Connecticut (a joint venture with the University of Rhode Island) and the Pennsylvania State University.

Courses may only be offered once per year and this may not meet the need. Processors in the group indicated that time, funds and personnel resources are all limiting the availability of training opportunities. Group members reported that FSIS regional information/training programs are not accessible to most operators.

Generally, most participants thought that the cost of training, itself, was reasonable. However, if significant travel is required to get to a course in another state, then this additional cost (i.e., travel, hotel, meals out) is often prohibitive to processors. It was suggested that training might be offered in conjunction with industry meetings or conferences.

Training Effectiveness

When reflecting on the effectiveness of training, there was general agreement that a basic HACCP program is not sufficient to meet the needs of industry personnel for completion, maintenance and reassessment of their HACCP plans. The basic course does not prepare processors to write a plan without further advice or help. More training time needs to be devoted to SSOPs, GMPs, prerequisite programs, recall plans, and traceback. Some suggested that product specific training might be more effective. Additional smaller, “bite-sized” modules with pre/post – tests might be useful for addressing some topics. Participants stated that there does need to be a way to evaluate effectiveness of training: maybe during annual reassessments. FSIS and EIAOs could determine if course participants are learning what they need to learn.

The group did consider the need for more rigor to the basic HACCP training process and continuing education beyond the basics. Some thought that it could be useful to have a standardized HACCP “certification” process. [Note: certification would go beyond basic HACCP training and involve a more standardized approach that could include a testing or evaluation process.] However, participants believe that if training is not required, many processors will not participate. There has been a lot of new information/guidance since HACCP began, but few have received more than basic HACCP training. This situation may be fostered by the lack of specific emphasis on the part of FSIS or industry to encourage processors to get more training. While some group members agreed that there does need to be a way to update processors on a regular (though, not mandatory) basis, they did not think requiring re-training every 5 years in basic HACCP would be beneficial.

Trainers, training materials and methods

Generally, those that provide training to meat and poultry processors develop their own materials—this reflects a lack of standardization, which group members thought should be strived for so that the course is the same no matter where you take it. Generally trainers use a manual or notebook, videos, and the FSIS Hazard Guide (18). Some use International HACCP Alliance (19) guidance and industry materials such as Silliker, Inc. videos (20). Training providers cited a variety of FSIS materials as useful, though they believe they could benefit from better communication/training by FSIS.

When questioned about computer based training, there was a lot of interest. A combination of interactive CD/DVD and web modules would enhance training. There was positive response to recent webinars sponsored by FSIS.

However, some thought that it is difficult to replace the benefits of human interaction found in on-site training. There did not seem to be any interest in a traditional mail-based correspondence course.

B. Information

Group participants, including industry, academics and regulators get most of their meat and poultry HACCP information from FSIS email, the FSIS web site and personnel, including inspectors, and FSIS regional information sessions. Participants like the new FSIS newsletter, though some stated that is often outdated by the time they receive it. Some look to industry associations (American Association of Meat Processors [AAMP], American Meat Association [AMI], Meat and Poultry Daily News: meatpoultry.com) for the latest regulatory and food safety information.

Industry representatives told the group that there are issues with using technology – equipment and sites. Some processors do not use computers as a source of information (even though they may use the computer for other things). Some operators do not have access due to location (too rural). Therefore, all information must still be provided on paper as well.

FSIS web site

Participants noted that the FSIS web site can be difficult to navigate and find what is needed. Only 3 participants were aware (from a list provided) of all the resources that are available on the site. In particular, some believed directives may be difficult to locate. Some are not aware of the numbering system—that numbers relate to subjects such as 7000 (processing), 6000 (slaughter). 5000 is a catch all that would be better navigated if organized or cross-listed by subject.

How do participants like to receive information?

Even though participants like to receive new information via the mail AND email, they stressed that the inspector in charge should be the primary source of information: information updates should be part of weekly FSIS/plant management meetings.

In addition, they would like all information, including email notifications to be specific and mailed only to those who need to receive it. Emails should be identified specifically in the subject line so that if it does not pertain to you or your operation; you do not need to read it. Participants also suggested: Q & As for all regulations/directives; daily telephone recordings with updates; web forums; and discussion forums accessible to all.

Compliance assistance

Small plant operators believe they need more resources, training and help to comply than larger plants do—there may not be a designated HACCP or food safety person in small plants to address compliance specifically.

There were two major concerns expressed:

- Difficulty with compliance because information does not get to plants in a timely fashion and
- Lack of standardized enforcement and interpretation on the part of FSIS staff.

FSIS compliance guides could help with this. Most are familiar with guidance, but usually only if referred by inspectors. Some processors may not know the FSIS website exists. For compliance guidance to be useful, it must be distributed in a timely fashion. Guidelines should be prepared for distribution as policy is made or rules promulgated—there should not be a lag between date of required compliance and availability of guidance for compliance.

Issues specific to state inspection programs

There needs to be better communication between state and federal regulators. In addition some group members called for more clarification and standardization of state and federal inspection programs. This related to concerns about custom exempt processors. Outbreaks or incidents in this section of the industry could affect the whole industry, but are these processors getting the food safety regulation, oversight, and information they need?

C. Scientific/Technical Assistance

There are important differences regionally depending on university/extension resources and quality of FSIS staff. In addition, FSIS needs to be aware of the diversity (of need, ability, expertise) within the designation, “small and very small plants.” A major issue was that plants need to get the answers to their questions and the information they need quickly. The group was asked about where they go for scientific/technical assistance.

FSIS assistance

There were mixed reviews for FSIS assistance. When asked about the FSIS Tech Center in Omaha, NE, some reported that the Center was not effective—answers were not consistent. (Some did think the Tech Center was helpful at times.) IKE timing is improving, but, needs more follow up. [Note: The Interactive Knowledge Exchange (IKE) is a tool used to enhance and improve the scientific basis of inspection activities among FSIS field personnel.]

While askFSIS was perceived to be somewhat beneficial, some problems were identified:

- It takes too long to get answers (unless someone else has asked the question and the answer is already posted).
- You cannot ask the question anonymously.
- You must have internet access to participate.

[Note: askFSIS is a web-based application, designed to help answer technical and policy-related questions from inspection program personnel, industry, consumer groups, other stakeholders, and the public.]

Operators were reminded that plants can go to their regional FSIS office for assistance.

FSIS small plant contacts and coordinators program

Most plant operators do not know about this program. Some of the contacts listed are no longer involved with HACCP. Some of these designees are more able to help than others due to subject matter expertise and/or resources available to them.

When small plants call contacts/ coordinators and the contact/coordinator does not know what the small plant operator is talking about, this makes coordinators/contacts appear unprepared to provide this service: operators then question why FSIS recommends it. FSIS needs to keep coordinators and contacts better informed and in a timely fashion. It might be useful to include trade organizations in this program.

Industry Assistance/Consultants

Small companies may not be able to afford membership in industry associations, though the American Association of Meat Processors (AAMP) is fairly reasonable in cost and helpful. Industry trade organizations often provide education materials, workshops, trainings, information at trade shows, trade magazines and opportunities for processors to help each other. Associations may help with interpretation of guidelines. However, not everyone has a state association. Larger companies have more options. Sanitizer suppliers and other suppliers may provide training resources at little or no cost.

FSIS cannot recommend consultants; the quality of consultants varies and many small plants do not know how to determine who is good and who is not. Perhaps some type of “certification” program for HACCP or process authorities would be useful though this may not be practical.

Universities/Extension

A variety of assistance is provided including supporting documentation, sanitation practices, sampling techniques, training opportunities (most often mentioned), validation studies, information lending library, material development, and/or how to set up a laboratory. Because all university/extension programs do not have the same resources, personnel or subject matter expertise, processors in states without strong university/extension meat and poultry science or food safety programs do not have the benefit of locally available and accessible academic resources. Even when a state does have HACCP related resources, university/extension programs (and also industry organizations) are often left out of the information loop—they are not updated as new guidance/regulations appear. The new Wisconsin meat and poultry HACCP web site is very useful, but the group felt that the Ohio State documents need to be updated.

Scientific journals

Often industry personnel are told to look to scientific journals for technical assistance. But, many do not have the ability to translate scientific information into practical application. It might be possible to take a related article and justify a decision based on technical expertise, but, if the process and/or product differs, the article might not be helpful. When trying to distribute useful information from these articles, there might be copyright issues that preclude the use of the information.

New technologies information and research

When asked to identify information and research needed to support the industry, the following were identified as topics of interest by participants:

- Antimicrobials (lactate and diacetate)
- Natural and organic preservatives
- Post-packaging pasteurization
- Computer models (with training and tutorials)

- Clear need for assistance with testing, testing frequency and validation of testing methods (relating to validation of processes)
- Would like documentation (fact sheets) to support CCP and validation decisions.
- Critical control point determination, verification, validation methods and documentation needed for beef jerky, ethnic products such as soujuk, basterma, and boudin, specialty salamis such as dried salami and ready-to-eat chorizo, whole muscle dried products and other niche products where no process validation exists.

A source of funding is needed to enable industry to purchase validation equipment such as water activity meters and data loggers. While USDA is a major source of funding for research, new sources are needed for equipment purchase, upgrading of processes, and training. Other sources include the American Meat Institute (AMI), National Cattlemen's Beef Association (NCBA), and industry.

Conclusions from meeting results:

- Basic HACCP training needs to be enhanced, augmented, and updated in order to provide operators with all of the tools they need to write, adopt, manage and validate a HACCP plan.
- Training needs of inspectors and other FSIS staff should be enhanced as well.
- Basic HACCP training needs to be available to all on a more frequent basis.
- Training materials need to be standardized and made available for the use of trainers: computer based training materials should be considered.
- There might be a greater role for FSIS personnel, including inspectors in training, information dissemination, and communication of training opportunities.
- The importance of initial and ongoing training needs to be stressed by the industry and regulatory personnel.
- Improvements have been made in information dissemination, but more are needed. FSIS and academic web sites need to be easily accessed and more user-friendly. Academic sites need to be updated on a regular basis.
- Communication between FSIS and contacts/coordinators/academics regarding new regulations, directives, protocols, etc. need to be timely and effective.
- While most industry folks are using computer technology and are comfortable receiving information this way, some still do not have access.
- Small and very small plants need more compliance assistance than larger plants. FSIS technical assistance could be more available and more responsive. There are concerns about anonymity when communicating problems via FSIS channels.
- All university/extension programs are not created equal when it comes to expertise and resources available. There are regional and state by state differences that need to be addressed if FSIS sees these programs as a major source for training and technical assistance.
- Areas specifically identified as in great need of training and technical assistance are validation, verification, trace-back programs, testing protocol, uses of antimicrobials, preservatives, and post-packaging pasteurization.



Recommendations

Additional regulations, regulatory interpretations, Agency policies and required practices (i.e., the *Listeria* regulation, changes in *E. coli* O157:H7 testing) have increased the complexity of developing, implementing and managing HACCP plans in small and very small meat and poultry plants since the promulgation of the initial rule in 1996. The scope of information needed to manage a HACCP plan can be daunting: sanitation programs, including those targeting *L. monocytogenes*, employee training, microbiology, testing methods (including testing for *E. coli* O157:H7), HACCP plan development, validation of processes, record keeping, verification activities, food defense, and recall plans must all be addressed.

The impact of this increasing complexity on the need for ongoing training, technical assistance and information is evident in the results of the two surveys and the working meeting discussed elsewhere in this document. These assessment activities have further explained the issues and identified recommendations from both those providing and those in need of training and information.

The following recommendations are made to FSIS and state inspection programs, industry, and academia. These stakeholders all have a role in the provision of user-friendly technical assistance, timely information, and effective training to improve HACCP programs in small and very small meat and poultry plants.

Recommendations to the USDA-FSIS (and state inspection programs, where appropriate):

The Small and Very Small Plant Outreach page of the FSIS web site provides the processor with the information and/or direction to the resources needed for developing and managing successful HACCP plans within the context of FSIS rules, regulations and policies.

To improve the effectiveness of this resource, it is recommended that USDA-FSIS:

1. Reconsider the Small and Very Small Plant Contacts and Coordinators program.

The Contacts and Coordinators were originally identified to provide technical advice, assistance, resources and conduct activities to support HACCP implementation in small and very small plants. However, this program is no longer considered an effective plant resource.

- Identify (with the help of stakeholders) a more effective network or system for disseminating information and technical assistance to plants and improving the availability of effective training programs and opportunities.
- Consider the development of regional training, technical assistance and information centers organized around regional FSIS offices and universities/extension programs in or adjacent to the region. Regionalization could minimize the effects of the disparity of expertise and assistance available from different state universities.
- Those providing training, information and technical assistance to industry must be updated in a timely fashion when changes are made in the expectations of processors.

2. **Inform processors about the email subscription service on the Small and Very Small Plant Outreach Page** found at:
http://www.fsis.usda.gov/news_&_events/Email_Subscription/index.asp.
3. **Update FSIS web pages with attention to deleting and/or updating links to other resources that are no longer available or up-to-date.**
4. **FSIS should use FSIS staff (in partnership with the web site, email and traditional mail) to regularly and systematically inform processors of changes and expectations resulting from new regulations or policies.**
 - Provide training and/or information regarding new regulations and policies at least several weeks prior to implementation so that plants have time to prepare for changes.
 - Hold joint training sessions to be sure that FSIS inspection staff and industry personnel hear the same message and have the same information.

Standardized training materials and sample documents would help to ensure a more uniformly educated industry workforce. It is recommended that USDA-FSIS:

5. Foster the development of standardized basic HACCP curriculum.

A “Seafood HACCP Alliance” type of curricula that is updated on a regular basis would help to ensure that all plant personnel are getting the same message and that they all have the potential to gain the same depth of knowledge needed to develop an adequate HACCP plan.

- Consider web-based training options that minimize the need for travel and time away from the plant.
- Consider providing FSIS inspection staff with same training opportunities so that they are more familiar with the material being provided to processors.
- Train-the-trainer programs must be provided to insure that there is a constant and consistent training force available.

6. Foster the development of training modules, as needed, that address changes in regulation and current/expected practice.

For example, training and information modules for *E. coli* O157:H7, *L. monocytogenes*, food defense, developing a recall plan, etc. Consider web-based training options that minimize the need for travel and time away from the plant. These modules would be based on guidance documents developed by FSIS. New regulations or requirements must not be promulgated without the prior or simultaneous availability of guidance documents informing processors of how to best comply with the regulations.

7. Update HACCP model plans to reflect current expected practice. Provide examples of adequate supporting documentation and references for each CCP with input from industry and academia.

Updated models should be available for all meat and poultry slaughter and processing categories. Update these examples as new research or practice develops.

- 8. Consider requiring ongoing training by processors.**
Survey results indicated plants in business for longer periods of time are less likely to have training programs or participate in off-site programs.
- 9. Identify a small and very small plant training, information and technical assistance advisory group to facilitate the implementation of these recommendations.**
Include representatives from academia, industry, FSIS and state inspection programs.
- 10. Identify and make available sources of funding to enable academics, extension personnel and others providing training to develop new, updated, and standardized training, technical assistance and information materials for small plants (see below).**

Recommendations to academia, Extension personnel and others providing training and information

Academic partners are often drawn from Land Grant University Departments of Animal Science, Food or Meat Science or Nutrition. While these partners choose to provide training and technical assistance to this audience, they are often limited by resources of both funding and time that must be allotted to teaching, research, and extension activities involving a variety of audiences. A coordinated training program with standardized curricula could make better use of limited resources. It is recommended that academic partners:

- 1. Work with FSIS and other program providers to develop standardized curricula for basic HACCP training programs as well as specific modules to address new regulations or policy changes.**
- 2. Coordinate training and the dissemination of information and technical assistance with other states in a region (some are doing this already).**
- 3. Consider producing curricular materials with a variety of delivery methods to meet the needs of a diverse industry.**
Traditional courses, on-line training, DVD or CD based courses, webinars and other technologies would all contribute to the availability of educational programming for this audience.
- 4. Consider providing information in smaller training modules that are user friendly, including *E. coli* O157:H7, *L. monocytogenes*, food defense, developing a recall plan, etc.**

Recommendations to industry

Industry partners must adapt to the increasingly complex food safety environment. It is unlikely that this can be accomplished without a commitment to keeping informed through regular visits to the FSIS website, seeking out opportunities for training and informing academic and regulatory partners of specific needs for training, information and technical assistance. It is recommended that processors:

1. Make use of information technology.

Become familiar with and use computer technologies that enhance the processor's ability to keep informed of FSIS information to the greatest extent possible. Learn about training opportunities and obtain technical assistance.

2. Sign up for and participate in the FSIS email communication opportunities, including https://service.govdelivery.com/service/multi_subscribe.html?code=USFSIS .

3. Make training a priority.

Budget time and funds for training activities—on site or off site. Make use of training resources available from universities, extension programs or industry partners (i.e., providers of sanitation supplies).

4. Join an industry association or form a state or regional association if none exists.

Industry organizations can foster cooperation and collaboration among members and advocate for programs that meet member needs.

5. Make the needs of processors known.

Find out who is providing training and technical assistance to processors in the state or region. Communicate the need for new and updated information and training to FSIS, state inspection programs and academia.

Appendix A: Email survey results



Online Survey of Training and Information Providers

Table 1
Background of Respondents

	Frequency	Percent
Are you an FSIS small plant coordinator and/or contact for your state? (n = 83)		
Yes	46	55
No	37	45
If YES then responded to following statement. (n = 46)		
I receive questions and requests for training from small meat and poultry processors.	44	96
I provide training to small meat and poultry processors.	39	85
I am able to keep updated on FSIS regulations and guidelines.	39	85
I value the FSIS mailings with news, training materials and Information for processors in my state.	39	85
I regularly visit the FSIS website for updates.	35	76
I attend regional training opportunities provided by FSIS.	30	65
Do you consider yourself a source for HACCP/food safety training and/or information for small and very small meat and poultry processors? (n = 83)		
Yes	72	87
No	11	13
Do you provide HACCP/food safety TRAINING (workshops, on-line courses, and other formal training programs) for small and very small meat and poultry food processors? (n = 72)		
Yes	46	64
No	15	21
I provide generic training (not targeted to meat and poultry industry), but small and very small meat and poultry processors attend my training programs.	11	15

Table 1 (continued).

	Frequency	Percent
Which HACCP/Food Safety workshops or training programs do you provide? (n = 46)		
Basic HACCP (2-3 day course including SSOP's, Hazard Analysis, HACCP plans)	40	87
Sanitation (not part of basic HACCP - separate course)	27	59
<i>E. Coli/Listeria</i> /BSE regulations and guidance (not part of basic HACCP - separate course)	24	52
Microbiology, pathogen detection and control (not part of basic HACCP - separate course)	17	37
Process validation (not part of basic HACCP - separate course)	16	35
Biosecurity/food defense (not part of basic HACCP - separate course)	8	17
Recall procedures (not part of basic HACCP - separate course)	8	17
Other	8	17
Trace-back (not part of basic HACCP - separate course)	4	9
How often do you conduct Basic HACCP workshops? (n = 46)		
2-4 times per year	19	41
As requested by industry	12	26
Once a year	11	24
I do not provide Basic HACCP workshops	4	9
How much do you charge (per person) for a Basic HACCP workshop (not including lodging and travel)? (n = 42)		
Don't charge/no fee	4	10
\$1 - \$100	9	21
\$101 - \$300	17	40
\$301 - \$500	7	17
>\$500	5	12

Table 1 (continued).

	Frequency	Percent
Has your basic HACCP course been approved by the International HACCP Alliance? (<i>n</i> = 43), cont.		
Yes	31	74
No	10	24
Not aware of International HACCP Alliance	2	5
INFORMATION and SERVICES you provide to small and very small meat and poultry processors (other than training) (checked all that apply.) (<i>n</i> = 72)		
Answer questions and refer to other sources of information, FSIS, consultants, experts, etc.	67	93
Consulting services for HACCP plan development	33	46
Consulting services for HACCP plan implementation	33	46
Consulting services for process validation	29	40
Consulting services for pathogen detection and control	28	39
Web site with HACCP information	25	35
Other	10	14
Does your academic background or professional training include any of the following? (<i>n</i> = 72)		
Food Safety	66	92
HACCP training	65	90
Food Science	59	82
Sanitation of processing plants	55	76
Microbiology	54	75
Food processing/engineering	43	60
What type of organization do you work for? (<i>n</i> = 72)		
University/college	35	49
Cooperative Extension (associated with Land Grant University)	23	32

Table 1 (continued).

	Frequency	Percent
Government/regulatory	16	22
Private Consultant	11	15
Industry or Industry Association	10	14

**Table 2
Training Program Needs Assessment**

	Frequency	Percent
Tools/Methods employed in your training programs. (chose all that applied) (n = 46)		
Lecture w/Power Point	45	98
Notebooks with copies of presentations/resources/references/ model plans	39	85
Small groups or break-out sessions	39	85
Manuals	34	74
Handouts other than resources notebooks or workbooks	28	61
Video	25	54
Textbooks	11	24
Training is delivered using web-based programming	6	13
Other	3	7
Web based courses	2	4
Do you develop your own teaching materials? (n = 46)		
Yes	41	89
No	5	11

Table 2 (continued).

	Frequency	Percent
Materials you develop for your training programs. (chose all that applied) (<i>n</i> = 46)		
Power Point Presentations	40	98
Small Group Exercises	32	78
Manuals or Workbooks	28	68
Notebooks	28	68
Videos	16	39
Other	1	2
What sources do you use for information used in your training sessions? (chose all that applied) (<i>n</i> = 46)		
University/Extension web sites or publications	40	87
FSIS web site	38	83
Industry association web sites or publications	33	72
FSIS materials supplied to small plant contact/coordinators	30	65
FSIS model plans	26	57
Text book(s)	24	52
Other	14	30
Which of the following, if available, would be a useful addition to your training program? (chose all that applied) (<i>n</i> = 46)		
Resources for process validation information	34	74
Updated HACCP models	29	63
Sample record-keeping forms	26	57
Resources for pathogen detection and control	26	57
Videos	25	54
Power Point presentations	23	50
A training manual	23	50
Web-based training manual	12	26

Table 2 (continued).

	Frequency	Percent
Which of the following, if available, would be a useful addition to your training program? (chose all that applied) (<i>n</i> = 46), cont.		
Other	4	9
How do you assess/evaluate the impact of your training sessions? (<i>n</i> = 46)		
Pre/post questionnaires at time of training session	31	67
I provide my contact information and request and encourage feedback at any time	28	61
Follow-up questionnaires at later date	10	22
I do not conduct a formal assessment	7	15
Other	5	9

Table 3
Respondent's perception of knowledge/competency of small and very small meat and poultry food processors (N=46)^a

Category	Knowledgeable		Somewhat Knowledgeable		Not Knowledgeable		Don't Know	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Writing SSOPs	7	15%	31	67%	8	17%	0	0%
Hazard Analysis	8	17%	32	70%	6	13%	0	0%
CCP identification	7	15%	34	74%	5	11%	0	0%
CCP verification	6	13%	29	63%	10	22%	1	2%
CCP monitoring	13	28%	30	65%	2	4%	1	2%
Process validation	4	9%	16	35%	26	57%	0	0%
Trace-back	1	2%	20	43%	23	50%	2	4%
Recall programs	2	4%	20	43%	22	48%	2	4%
Record keeping	10	22%	32	70%	4	9%	0	0%
<i>Listeria</i> Control	6	13%	29	63%	10	22%	1	2%
BSE	7	15%	30	65%	6	13%	3	7%
<i>E.coli</i> O157:H7 Control	7	15%	33	72%	6	13%	0	0%
Biosecurity/food defense measures	3	7%	14	30%	8	52%	5	11%
Keeping up with new guidance or regulations	4	9%	28	61%	8	30%	0	0%

^a Question: How would you rate the knowledge/competency of small and very small meat and poultry plant personnel in the following areas?

Appendix B: Northeast processors survey results and tables



Table 1
Demographic Characteristics of Survey Respondents

	Frequency	Percent
Title that best describes position (<i>n</i> = 296)		
Owner	138	47
HACCP or Food Safety Manager	60	20
QC or QA Manager	59	20
Other	31	10
Shift Supervisor	8	3
Line Supervisor	0	0
Type of operation (<i>n</i> = 296)		
Raw, ground meat and poultry	163	55
Slaughter operations, beef, pork, poultry, other ^b	147	50
Raw, not ground meat and poultry products including beef trimmings and mechanically tenderized meats	130	43
Fully cooked, not shelf-stable meat and poultry products	117	39
Not shelf-stable, heat-treated, not fully cooked meat and poultry products	71	24
Heat treated, shelf-stable meat and poultry products	47	16
Meat and poultry products with secondary inhibitors, not shelf-stable	29	10
Not heat treated, shelf-stable meat and poultry products	15	5
Thermally processed, commercially sterile meat and poultry	13	4
Mechanically separated meat/mechanically deboned poultry	12	4
Irradiated meat and poultry products	0	0
Ready-to-Eat products are produced (<i>n</i> = 300)		
Yes	138	46
No	161	54

Table 1 (continued).

	Frequency	Percent
Export products (n = 296)		
Yes	63	21
No	234	79
Use imported products (n = 296)		
Yes	139	47
No	157	53
Animals/species processed (chose all that applied) (n = 296)		
Beef	228	77
Pork	216	72
Poultry	177	60
Lamb	88	30
Goat	41	14
Deer/elk	30	10
Bison	23	8
Other	23	8
Ostrich/emu	9	3
Have employees who <i>do not</i> speak English (n = 300)		
Yes	131	44
No	168	56
Have bi-lingual managers/supervisors who can communicate with non-English speaking personnel (n = 206)		
Yes	145	69
No	62	30
Do not know	2	1
Where do you routinely get information (chose all that applied) (n = 296)		
FSIS mailings`	247	83
EIAO or other FSIS personnel	155	52
FSIS website	122	41
Industry/trade associations	94	31
FSIS e-mail	68	23

Table 1 (continued).

	Frequency	Percent
Where do you routinely get information (chose all that applied), cont.		
Consultants	64	21
University/Cooperative Extension	30	10
State Inspection personnel (in Maine or Vermont only)	7	2
I do not have a source for information at this time	5	2

**Table 2
Training Needs Assessment**

	Frequency	Percent
Regular training is important to the success of your HACCP plan (<i>n</i> = 300)		
Very important	196	65
Somewhat important	85	28
Not important	19	6
Have an established training program in your operation (<i>n</i> = 300)		
Yes	155	52
No	145	48
Who has responsibility for training in your operation (chose all that applied) (<i>n</i> = 225)		
Myself	168	75
Quality control/HACCP personnel	82	37
Other supervisory personnel	55	25
Outside consultants or trainers	35	16
Other	13	6
University/Extension personnel	4	2
Do those with training responsibilities have any formal training in food safety, food science, or meat science (<i>n</i> = 225)		
Yes	171	76
No	50	22
Don't know	4	2

Table 2 (continued).

	Frequency	Percent
Type of formal training that trainer has (chose all that applied) (<i>n</i> = 180)		
HACCP Course	165	92
Sanitation course	90	50
Industry training	73	41
Professional development	46	26
Undergraduate	41	23
Graduate training	28	16
How much you expect to pay per course for training (<i>n</i> = 280)		
a. A one-day workshop/seminar offered off-site		
\$0	41	15
< \$50	50	18
\$51 - \$100	67	24
\$101 - \$150	65	23
\$151 - \$200	40	14
>\$201	17	6
b. A correspondence course/CD self study		
\$0	54	20
< \$50	120	43
\$51 - \$100	70	25
\$101 - \$150	22	8
\$151 - \$200	5	2
>\$201	5	2
c. An internet based course		
\$0	89	32
< \$50	112	41
\$51 - \$100	49	18
\$101 - \$150	17	6
\$151 - \$200	6	2
>\$201	2	1

Table 3
Training topics requested, in order of interest (*n* = 301)

Item/Topic	% not interested	% Somewhat interested	% Very interested
a. Basic HACCP	34	36	30
b. HACCP regulation updates	15	40	45
c. Good Manufacturing Practices	22	39	39
d. Cleaning and sanitation	20	40	40
e. Employee health and hygiene; policies	28	47	25
f. Storage and labeling of chemicals	44	38	18
g. Allergen controls	40	34	26
h. Water safety	48	37	15
i. Equipment maintenance	36	41	23
j. Pest control	40	43	17
k. Maintenance of grounds, sanitary facilities and work environment	42	45	13
l. Microbiology	38	34	28
m. Detection and control of pathogens	20	39	41
n. Antibiotic residues in meat and poultry	43	34	23
o. <i>Listeria</i> regulations	28	36	36
p. <i>E. coli</i> regulations	24	35	41
q. Mad-cow disease (BSE)	59	27	14
r. Process controls and CCP identification	27	41	32
s. Validation of processes	25	44	31
t. Irradiation of meats	64	23	13
u. Plant security and food defense	39	40	21
v. Labeling	26	49	25
w. Recalls	30	41	29
x. Record keeping	25	45	30
y. Appealing FSIS Non-compliance Reports	31	39	30
z. Other	56	20	24

Table 4
Preferences for how respondents would like to receive training and information (*n* = 301)

Item/method	% not interested	% Somewhat interested	% Very interested
a. Off-site training: in-state	28	38	34
b. Off-site training: in the region	51	32	17
c. Off-site training: anywhere in US	84	12	4
d. Printed brochures/fact sheets/ newsletters	12	37	51
e. Correspondence/independent study (print-based)	25	42	33
f. Web-based/internet	23	34	43
g. Videotapes	23	39	38
h. Power-point presentations	38	38	24
i. Audio tapes	54	30	16
j. Satellite downlink	67	24	9
k. CD-ROM or DVD	17	38	45
l. Other	67	24	9

**Appendix C: Working Meeting Agenda and Summaries of Transcribed
Group Discussions**



Preparing Small and Very Small Meat and Poultry Establishments for the Future of HACCP: A Cooperative Approach

April 30, 2008

Agenda

- 8:00 am Registration**
- 9:00 am Welcome and Introductory Remarks**
- Diane Wright Hirsch, University of Connecticut
 - Catherine Nettles Cutter, The Pennsylvania State University
 - Karlease Kelly, Food Safety Inspection Service (FSIS)/
United States Department of Agriculture (USDA)
 - Jay B. Wenther, American Association of Meat Processors (AAMP)
- 9:30 am Two surveys: Assessing the Information and Training Needs of Personnel in Small and Very Small Plants**
- Diane Wright Hirsch, Extension Educator/Food Safety, University of Connecticut
 - Robert K. Gable, Emeritus Professor of Educational Psychology
University of Connecticut and Director, Educational Leadership Doctoral Program, Johnson & Wales University
- 10:15 am Break**
- 10:30 am FSIS Small and Very Small Plant Outreach Program: A review of current activities**
- Karlease Kelly, Senior Executive, Office of Outreach, Employee Education and Training, Food Safety & Inspection Service
- 11:15 am Working Group Sessions: Schedule and Assignments**
- Move to break-out rooms: Session 1**
- Participants will be assigned to working groups which will address one of the following planning topics:
- 1) HACCP Plan training and implementation: Basic and beyond
 - 2) New regulations/guidance/policy: Informing the industry
 - 3) Scientific/Technical assistance: Availability, need, and application
- Introductions and Instructions
- 12:15 pm LUNCH**
- 1:15 pm Working Group Session 2**
- 3:00 pm Break**
- 3:30 pm Working Group Session 3**
- 5:00 pm Break time**
- 6:00 pm DINNER**
- 7:00 pm EVENING**
- Full meeting session**
- Working Group Reports, Discussion and Next Steps
- 9:00 pm Adjourn**

Working Meeting Discussion Questions and Summaries of Transcribed Group Discussions

Group I: HACCP Plan Training and Implementation: Basics and Beyond

1. What do you think about basic HACCP training that is currently provided to small and very small meat and poultry processors?

Key points noted in discussion

The basic HACCP course (2-3 day course) only provides an introduction to HACCP. It does not prepare HACCP coordinators to write a plan without further advice or information.

Additional discussion

- Break the information down into smaller parts for training.
- Add more comprehensive Sanitation Standard Operating Procedure (SSOP) training.
- Processors would prefer training programs that relate more to their specific product and process; more practical sessions that provided basic tools, such as forms and checklists and record-keeping materials.
- HACCP courses need to be updated as new information, regulations, notices and compliance guidance are issued.

Basic HACCP Course Availability

2. How available is a basic HACCP training course in your area? Are courses available to all who need them? And 5. Are you aware of regional differences in the availability of basic HACCP training?

Key Points noted in the discussion

Basic HACCP courses are not always available to those that need them. For example, Illinois, Washington, New York do not have courses available at all or only sporadically. Many states/regions only offer the course once per year. There are regional differences in course availability.

Additional discussion

- There is no emphasis on the part of FSIS staff for industry to do further training.
- It is not cost effective to send people to courses in other parts of the country.

3. How do you find out about basic HACCP training opportunities?

4. What is the best way to inform small plant operators of training opportunities?

Key Points noted in the discussion

Industry folks see and talk to inspectors every day. Using the FSIS staff in each plant to inform personnel about training opportunities would be most effective.

Additional discussion

- We find out about basic HACCP training through the meat association (AAMP), Extension offices, state meat associations.
- Extension should send notices regarding training to FSIS and all licensed plants.
- The International HACCP Alliance is “a zero.”
- The new outreach program of FSIS could help with this.
- The Internet is not an effective way to reach all people.

5. What are participants willing to pay for basic HACCP training?

Key Points noted in the discussion

The cost of the course itself is not a big issue—the problem is if courses are not local, there are significant costs for travel, hotel, etc. In addition, plants need to factor in the cost of just being away from the plant.

Additional discussion points

- When the regulation was first introduced there were funds available from FSIS to offset course costs for Extension as well as industry.
- Early on courses were more local
- Perhaps the course cost could be adjusted based on plant size: \$125, 175, or 225
- Introductory HACCP courses should be available locally
- Courses may cost \$495 per person now, while total costs (including travel) are well over \$1,000.
- Materials should be included in the cost of the program.

Effectiveness of Training

6. After attending a basic HACCP training course, do you believe you were well prepared to write your HACCP plan?

7. What additional help did you need with your HACCP plan before you could operate/make the product under USDA-FSIS inspection?

Key Points noted in the discussion

The basic HACCP course alone is not sufficient to prepare plant operators to write a HACCP plan. Operators often need to come back after original HACCP plans are written and redo them so they are more workable in their operation. Additional help is needed from Extension programs, FSIS or consultants. For some, the only way to get through the plan writing process is when the instructor comes back for individual help.

Additional discussion points

- Operators need to be motivated and look for answers
- Educational background helpful to understanding HACCP
- FSIS website was helpful when building HACCP plans
- FSIS generic plans are not helpful—they do not fit operations of plants
- Not every state has Extension faculty or staff with expertise to write plans or there may be policies in place that do not allow them to write plans.
- Training provides the theory: theory may not help with practical application

8. What would make basic HACCP courses more useful or effective for small plant operators?

Key Points noted in the discussion

Training would be more helpful if tailored to each individual type of process, ie hot dog, raw ground.

Develop a program of small, bite size educational modules with pre and post tests to see if information is learned and understood. It would be helpful to have some type of incentive or motivation for employees to complete training.

9. Are there any topics that need to be discussed more thoroughly during a basic HACCP course?

Key Points noted in the discussion

The basic HACCP course should include more emphasis on SSOPs, SPS, GMPs and prerequisites—more discussion of what belongs in the HACCP program and what belongs in prerequisite programs.

Additional discussion points

Topics that need discussing differ with each type of plant operation.

These topics need to be discussed more thoroughly:

- lotting
- basic 7 principles

10. Many small plant operators have not attended a training course since first implementing HACCP. Would it be valuable to require regular training at certain intervals of time (such as every 5 years) as it is for retail food providers in many states?

Key Points noted in the discussion

A mandated training course every 5 years would not be useful. If it is required, then those that are already getting the training on their own might be penalized. There aren't that many changes in basic HACCP. Changes that are occurring are FSIS notices, directives, compliance guides and regulatory requirements in response to outbreaks. Therefore, FSIS inspectors should play a greater role in making sure that plants are operating appropriately.

In addition there needs to be more consistency in how FSIS staff responds to changes and interprets guidance and directives.

Additional discussion points

- We need a balance of consistency and reason from FSIS staff.
- Inspectors are not trained in how to train plant operators in HACCP
- Inspectors could make recommendations on how to run a better plant – hands on

Training Materials, Curricula, Resources, etc.

11. What resources or materials are used for training? Consider:

- **What curricula is used in training?**
- **Do you know who developed it?**
- **Do you use a textbook (e.g. GMA), notebook, the Hazard Guide, and/or power point presentations?**
- **Any other materials used for training?**

Discussion points

Materials used include-

- International HACCP Alliance
- Video, notebook, hazard guide
- Interactive cd from Silliker

12. Do you use the resources the HACCP Alliance offers for training?

Key Points noted in the discussion

The resources of the HACCP Alliance are not used by this group. They thought that the Alliance was not responsive. Trainers develop their own materials, and also have become HACCP Alliance approved trainers.

13. Do you use the resources provided by FSIS?

Key Points noted in the discussion

Participants use materials and resource provided by FSIS. They find that Ask FSIS is an effective program that does respond to questions

14. What additional materials would help to make basic HACCP training programs more useful and effective? Consider:

- **Is there a need for standardized curricula?**
- **Do FSIS model plans need updating?**
- **Are more model plans needed?**
- **Are they useful to you?**
- **Any other materials (video, web based, printed, content areas) you would like to help with your training? Everything in list can come from a variety of sources.**

Key Points noted in discussion

- There should be standardization of curricula in the basic HACCP training program
- FSIS model plans need updating and should be more specific
- If you are brand new the models are helpful and a good starting point, they should be updated, though.
- Would like documentation (fact sheets) to support CCP and validation decisions; how can we determine if scientific research matches needs in processing?

15. What is the best mechanism for delivery of basic HACCP training? (1 day course, 2 day course, more?; internet or web based course?; learn by mail?..)

Key Points noted in the discussion

The basic 2 day HACCP course is good for an introduction. A combination dvd and web based training with programs in small modules or segments would be useful. Certification should be offered when training completed. Perhaps something like the USDA AgLearn system could be used for managing HACCP training programs.

16. How can we best ensure that courses are updated and that they are providing the most recent guidance and information?

Key Points in the discussion

Bring in inspection agencies. Work with state inspection, FSIS and EIAOs to find out if course participants are learning what they need to learn.

Operators are reassessed annually to determine if they are meeting HACCP guidelines: this is the opportunity for the HACCP program itself to be reassessed.

Beyond the Basics – Training after the Basic Course

17. Is there any type of regular HACCP program/food safety/sanitation training being conducted in small plants?

Key Points in the discussion

Participants reported that some training is done, including on-the-job education, but no “standardized”, regular training is being done. Training is not being documented.

18. Who is doing the training?

Key Points in the discussion

Any training is being conducted by a trained trainer, HACCP coordinator, or person who took the HACCP class; they, in turn, train the line people. Some training is done by meat inspector, but not a formal training session

19. What are the barriers to a regular training program for small plant operators and their employees?

Key Points in the discussion

Barriers to regular training include cost, time, lack of resources, employee turnover and employee quality.

20. Are small plant personnel attending or participating in training provided by FSIS, Universities, the Industry or Extension Programs?

Key Points in the discussion

Some are participating in training. There would be a better response if it was more convenient, closer to plants. Some will only attend if mandated.

21. If so, which training programs and how often?

Key Points in the discussion

Participants have attended courses in Advanced HACCP (*E. coli*, *Listeria*, sanitation), labeling, and first time basic HACCP .

Additional discussion points

1. FSIS needs to get information out more consistently and in a timely manner to inspectors and plants when a crisis or situation arises. It is important to present the same information to operators and inspectors so that they are all on the same page. FSIS needs to get the information to the educational institutions so that they can get the information out to the plants. Also, collaboration with Trade Associations may help FSIS to respond more quickly and get information out more quickly.
 2. Interpretation of regulations:
There needs to be communication between the federal and state governments and clarification of state functions. State and federal meat inspection programs should be re standardized. The federal government needs to clearly define state agency functions.
-

Group II: New Regulations/Directives/Notices: Informing the Industry

Availability of New Information

1. How do you find out about new Regulations/Directives/Notices?

Key Points noted in discussion

- E-mail notifications from FSIS
- AAMP notifications
- Inspectors and weekly exit meetings
- AMI, FSIS e-mail systems
- Other associations
- Meat and Poultry Daily News
- FSIS website

2. How did you find out about: the Listeria regulation? the E. coli O157:H7 directives? BSE?

Key Points noted in discussion

- As above (question 1 response), e-mail, AAMP(must join, only with membership), industry trade journals (a lot free, but some have to subscribe)
- Regional sessions, USDA invites plants to 1-day sessions

3. Review web site resources with computer. Are you aware of these? Do you use them? Why or why not?

Ask FSIS

Small Plant News, newsletter

Location of notices, directives, etc.

Industry resources (such as the AAMP [American Association of Meat Processors], NAMP [North American Meat Processors] or GMA [Grocery Manufacturers Association] or (AMI) American Meat Institute

Key Points noted in discussion

It is more complicated to navigate FSIS website then before – although some thought it had gotten a little better recently. It is generally difficult to find things. Which directive addresses what issue? There is no subject index. How do you know? Titles tell you more than numbers. Perhaps they should be cross-listed as title of directive OR directive number or possibly there should be cross-referencing number and titles. About half the room had trouble navigating the FSIS website as it is now.

Additional points of discussion

- We took a vote – only 3 participants were aware of all resources stated. 10 were aware of some.
- One person in the room gave the group some information in regard to numbering and subject – 7000 series was processing, 6000 series was slaughter and 5000 series was everything else.

4. How would you most like to receive information about new regulations, directives, policies, etc.?

Key Points noted in discussion

It would be helpful to have a Q and A with all directives to take the guesswork out of the interpretation. Recorded telephone notices depending on area and clientele – particularly if facility with no e-mail or Internet service. Recording, daily, on a phone service that processor can call to get updated information quickly.

A large problem is the use of technology across the industry. This is a cultural and technical problem. Some industry folks have not problems adapting to technology, others to. Small processors may not have computers or may be in an area where access is not available (rural VT, OH). Basic directives should be on paper as well for these folks.

Additional points of discussion

- Would like information from USDA compiled as a resource list
- Inspector in charge could be the source of this information. Industry relies on the inspector to bring information that only pertains to the facility and processor e.g. beef OR poultry. Use the weekly meetings to discuss relevant directives/notices/guidance.
- E-mail notifications are good but have to go to a link and “dig” into it. Would be nice to have a headline with subject matter to know whether it pertains to the processor or not.
- Web forums were mentioned – discussion groups that are accessible to all.
- Inspector giving updates via telephone perhaps – top three changes.
- Companies should be able to pick which ways to get information.
- New newsletter – small plant news. Good vehicle to indicate new directives, etc. Mailed to every establishment part of the plant based inspection system (PBIS). Do you have to sign up? Does everyone just get this mailing?

In this group, the following additional discussion took place.

There was discussion here about how individuals here were committed to food safety; but concerns about small operators that are exempt. Regular plant personnel are concerned with with small plant producers such as these. Participants thought another meeting should address these exempt processors – these are state issues. There is an emerging class of value-added farmers and producers looking into direct sales. So even if exempt, if someone gets sick, all meat and poultry processors take the “hit”. Are the custom exempt people getting the information? Is FSIS working with the states and outreach to educate this group? They may not be getting FSIS documents, but are they getting trade journals? Do they care? These people must be brought into the discussion. This was a HIGH INTENSITY discussion.

Compliance Assistance

5. What do you think makes it more difficult for small plants to comply with new directives, regulations or the HACCP rule than for large plants?

Key Points noted in discussion

It is difficult to comply with new directives because information does not get to processors in a timely fashion. There is too long a time lag between the publishing/institution of directives/regulations and the printing of compliance guidelines for the industry.

Compliance may be further hampered by interpretation problems. For example, Notice 6507 on E.coli – interpretation for testing – everyone says something different!!

A Q and A for each new directive should be published in layman’s terms. Interpretive summary is needed since small plants rely on compliance guidelines more than large plants. If guidelines not well written or adequate supporting documentation – trouble for small plants vs. large ones that can do own studies.

Additional points of discussion

- Do small plants have harder time complying? YES. Small plants need outside help versus larger plants. Larger plants with in-house services; therefore small plants do not get results as fast.
- Resources, cost and understanding – “you vs. inspectors” interpretation is problematic.
- Some intimidation. No “point” person that is educated to appeal. These people are found in large plants. Small 5-10 person plants, difficult. Maybe not intimidation so much but having the resources and expertise and time to appeal.
- Maybe we should re-define “small plant”. True small plants have fewer numbers – the definition may be too high.

6. Tell us what you know and what you think about the FSIS Small plant Contact/Coordinator program.

Key Points noted in discussion

Generally plant personnel do not know about this program. About 5 people in the group were aware. Perhaps use the newsletter to inform industry about state contacts and alert inspection personnel about the program.

7. Are you familiar with FSIS Compliance Guides?

(go to: <http://www.fsis.usda.gov/Regulations & Policies/Compliance Guides Index/index.asp>)

Are they useful?

Do operators need more information?

What type of information do operators need?

Key Points noted in discussion

Again, there is a lag time between compliance and regulatory. Guides are useful only if they come out in a timely manner. Regulations are issued and then directives are issued, but compliance documents do not follow in a timely manner. Directives and compliance should come out at the same time.

How these items are interpreted by each inspector can be problematic. Industry should communicate with inspector; but each inspector may interpret things differently. Industry needs something – Q and A – that is in layman’s terms.

Additional points of discussion

- General familiarity with the guides – use is split within industry.
- If they do have them, they have been given to them by the inspectors. Most do not know that the website exists.
- More information is needed. But only send directive/compliance to those that need it – need based only.

8. Where can small plant operators go for more assistance to help them comply with new directives/regulations?

Key Points noted in discussion

AskFSIS (via web). Not specifically listed. Very new. Return answering time is very slow since answers are in writing – timeframe depends on issue. The Tech center, which many gave up on long ago, does not really exist anymore. Gave up on it since “experts” gave different answers – depended when you called and who you got (inconsistent answers). But tech center not really answering any more. AskFSIS has taken over the roll. Questions are being channeled through AskFSIS.

People answering are now part of the policy office. But again the answers are not timely unless question is already listed and answered. Problems are:

- While written (good, used for documentation), takes too long
- Must reveal yourself – cannot ask question anonymously since you have to sign up
- Must have internet access to use

Additional points of discussion

Assistance also comes from

- Industry groups – usually charge a % of sales to belong – big cost so not good for small companies. AAMP is better for small companies (still a cost), but others can cost thousands.
- Trade magazines
- USDA-FSIS Inspectors
- Extension services
- Industry helping each other – every region may be different as to answers to questions regarding products. Supposed to be the same but is not.
- Internet – google
- International HACCP Alliance
- Sanitizer suppliers or other suppliers

9. Are Land Grant universities/Extension programs providing information and compliance assistance in your state? If yes, what?

Key Points noted in discussion

States represented in this group that could use this service – VT, ME, NJ, IN, OH, PA, SC) and mostly said yes. A variety of assistance was provided by different programs:

- Supporting documentation
- Sanitation practices
- Sampling techniques
- Training opportunities (this appeared to be the most)
- Validation studies
- Provide information – like a library. Lending videos etc.
- Material development
- How to set up a lab in a plant
- Web page development

10. Are industry associations or consultants providing information and compliance assistance? If yes, what?

Key Points noted in discussion

- Pay for it – some expensive, some cost effective
- Wealth of information via industry associations like AAMP.
- Process authority – some discussion as to what this really means. Can industry be its own process authority? It depends.
- Best management practices
- Education materials
- Some called association often – interpretation and confirmation of guidelines
- Workshop/trainings
- Information at trade shows

Training

11. Are there sufficient opportunities for training when new regulations/directives/notices are administered? Are there regional differences?

12. Have you ever attended a regulatory education workshop or participated in a regulatory education web seminar? If yes, were they effective/worth your time/useful?

13. Would you be interested in providing/receiving training beyond basic HACCP (perhaps in response to new rules or notices and their compliance guidelines)?

Key Points noted in discussion

- Participating trainers first answered – Yes and No for opportunities for training. Some stated have more opportunities to participate in training than others—it depends on the resources available to them: time or facilities.
- Industry not always showing up to USDA-sponsored workshops. However, these are regionalized anyway – too few. Who could really go?
- If training is not required, many will not go – no time. If industry folks can do this by themselves and take care of this, then will do it. Since original training, so much new stuff – but still don't go.
- South Carolina – regionalizes training and goes out to industry.
- Small plants and very small plants can't send people out as often.
- Use conventions to disseminate information or offer training.
- There are some opportunities for training via individual help from inspectors.
- Split as to whether have opportunities – depends on state. However, even if they had the opportunity, time and money issues – don't take advantage
- FSIS had training via website (e.g. webinars), but what about those without Internet access????
- Generally when went to regulatory workshops, did not find value. Workshops had a mixed response from the group. Not many attended regulatory workshops.
- May be interested in beyond HACCP – trainers have limited resources. Must be timely with training.

14. In what form would you like to receive this training? (workshop, web or internet based, mail course)

Key Points noted in discussion

Participants want self-directed training – Internet or Interactive CD-ROM or DVD. Small plants lack resources to send people to training. However, if training were closer and more convenient, it would at least be easier to consider.

Additional points of discussion

- Those who attended webinars found them generally good – well worth it. Sign up and get e-mail with link at prescribed times
- No interest in mail course
- Web/Internet
- CD
- Internet based class – call in and use computer so can ask questions over phone or type or send. Power Point presentation on the computer. Small plant outreach.
- AFDO – free on line course for retail meat and poultry – could be a place
- Workshops – constraints due to time and personnel
- Seminars – selective
- Workshops – hard to replace human interaction

15. What are the barriers that keep small plant personnel from participating in additional training opportunities?

Key Points noted in discussion

Time, resources etc. All said before.

16. Would you consider participating in (or offering, if you are at trainer) a training session for any of these topics?

Key Points noted in discussion

We took a vote. Need depends on the operation.

- | | |
|---------------------------------------------------|-----------------------|
| ▪ Sanitation (in depth) | 7 participants |
| ▪ Good Manufacturing Practices | 5 |
| ▪ BSE | 4 |
| ▪ <i>Listeria</i> control | 5 |
| ▪ <i>E. coli</i> O157:H7 | 7 |
| ▪ Traceback/tracking systems | 4 |
| ▪ Training your employees | 3 |
| ▪ Food plant defense/bioterrorism issues | 2 |
| ▪ Crisis management/recalls | 5 |
| ▪ New guidance and/or regulations | 8 |
| ▪ Verification/validation (added this one) | 7 |

17. Is there anything else you would like to share regarding how we can be informed about new FSIS rules/directives/notices/etc.?

Key Points noted in discussion

- Participants talked about an ombudsman position in the agency. Those that wanted one found out that there was one!! The availability of the ombudsman is actually listed somewhere on the FSIS website – no cost, but not timely.
 - Plants can contact regional FSIS offices. This process exists. Part of appeal process. This process is effective.
 - Want to get answers to questions quickly. Struggle to get a simple yes or no answer because a name (FSIS person) may be affiliated with an answer. Ask FSIS may be of some help.
 - Interpretation issues
 - Just in time meetings – not enough notice
 - On-site training done in big cities – not easily accessible.
-

Group III: Scientific/Technical Assistance: Availability, Need, and Application

1. What kinds of technical assistance do small plant operators need?

Key Points noted in discussion

It would be beneficial to have more approved standardized procedures or “safe harbors” such as Appendix A and B. In addition, standard “approved” HACCP record keeping forms (monitoring, pre-shipment review, verification) would be helpful.

Additional points of discussion

- FSIS consistency needs to be improved, district manager needs to reconcile inspector differences
- FSIS needs to provide more technical assistance
- Small plants don’t know how to write an appeal, scared to write an appeal
- Need for research on validated processes for unusual products
- Understanding how research on “x” applies to product “y”
- Templates may not always apply, education is needed, plants don’t always know their own plan

Availability of Scientific/Technical Assistance

2. Do you know where to find the scientific/technical assistance and information you need?

Key Points noted in discussion

Yes, word of mouth, trade publication, other processors.

3. Where do small plant operators go for technical assistance? Who do they contact?

- Do you make use of the FSIS Policy Development Division of the Office of Policy, Program and Employee Development? (This was formerly known as the Technical Service Center (TSC).)
- Does the TSC provide you with the information or assistance you need?
- Have you used the TSC? Describe your experience with the TSC.
- Do you make use of IKEs (Interactive Knowledge Exchanges)?

Key Points noted in discussion

Nebraska tech center very helpful.

Additional points of discussion

- Start with inspectors, state inspectors are more helpful than state inspectors
- Small processors need more help dealing with overwhelming information on the web
- AskFSIS, AAMP, suppliers, customers, networking with other processors
- IKE timing is improving, needs more follow-up

4. Review web site resources with computer. Are you aware of these? Do you use them? Why or why not?

- The FSIS website as a source of technical information: can you find the information you need? If not, what was the information that you needed, but could not find?
- Small Plant News, newsletter
- Ask FSIS

- **University of Wisconsin site, Ohio State University site, other university/extension sites**

Key Points noted in discussion

The industry is not computer literate enough in many cases. Even those that may have computer access, often don't have high speed internet. FSIS inspectors may be only point of contact for many very small plants. Inspectors need approval and expertise to provide assistance.

Additional points of discussion

- Small Plant News is dated information
- Wisconsin website is very useful

5. Tell us what you know and what you think about the FSIS Small plant Contact/Coordinator program?

Key Points noted in discussion

The FSIS Small plant Contact/Coordinator program is good, but FSIS should devote some effort to continue to keep the program active and keeping the Contact/Coordinator more informed. FSIS also should explore ways in which trade associations can be involved in the Contact/Coordinator program. The Contact/Coordinator program would be more effective if universities were involved PRIOR to information being shared with small plants (or at least at the same time). When FSIS informs small plants about a change, and the small plant calls the state contact for more information, but the state contact has no idea what the small plant is talking about because FSIS hasn't shared that same information with the contacts, this makes FSIS and the Contact/Coordinator's look foolish.

6. Is there a university/extension food science or animal science department you can call on for help in your state?

- **What kinds of services do these programs provide?**
- **What recommendations do you have to improve these services?**

Key Points noted in discussion

Universities left out of the loop, Trade associations left out of the loop. They need to receive the same information at the same time as plants/inspectors in order to respond in a timely fashion (see above).

The participants suggested that there be a partnership between trade associations and universities. This may help to increase training session attendance. Concerns about training include cost of training, need for funding to support training, ability to develop training materials in a timely fashion, need for consistent training messages, using AskFSIS as a resource.

Additional points of discussion

- It would be helpful to share best practices within the industry.

7. Are there consultants known to you who can provide scientific/technical assistance?

- **Have you used these services?**
- **If so, what type of services do these individuals provide?**
- **What recommendations do you have to improve these services?**

Key Points noted in discussion

There are issues with respect to listing consultants on the FSIS website: cannot appear to endorse consultants.

Additional points of discussion

- Everyone knows of several, HACCP, micro sampling, processing authority
- The issue of variable quality between consultants was discussed. The idea of a formal “certification” program for HACCP or process authority consultants was discussed. This idea has merits, but practical implementation issues are not trivial.

8. Can you get help from industry organizations (ie. AAMP, AMI)?

- What services do they provide?
- What recommendations do you have to improve these services?

Key Points noted in discussion

AAMP is helpful and very affordable. Some limitations in sharing information from a peer reviewed publication (copyright issues—who “owns” the information?).

Additional points of discussion

- AMI is similar to AAMP but more expensive, but serving larger companies.

9. Are there regional disparities in the availability of technical assistance?

Key Points noted in discussion:

Yes, due to inspector differences, due to university differences as well.

New Technologies Information and Research

10. Are there some areas where new technologies might be needed in order to improve the safety of meat and poultry products?

Key Points noted in discussion

- Participants believe they are up to speed on existing technologies
- Antimicrobial research is needed (lactate and diacetate)
- Natural and organic preservatives are needed
- Post packaging pasteurization research needed

11. Are there some suggested research needs for technologies needed to improve the safety of meat and poultry products?

Key Points noted in discussion

- Easy, affordable, easily monitored, all natural, 100 effective
- Computer models, but need training and tutorials

12. Who is doing research in this area?

Key Points noted in discussion

In order to have a better knowledge/awareness who is doing research in this area, FSIS should maintain a list of state contacts, make it easier to locate resources, USDA ARS. IIC (Inspector-in-charge) needs to be aware of this list. Create a list like the HACCP contact list.

13. Where is funding coming from? What funding needs exist?

Key Points noted in discussion

USDA CSREES is a major source of funding.

Additional points of discussion

- AMI foundation
- NCBA
- Industry
- SVSPO no longer funds research
- Need funding to support purchase of data loggers, water activity meters

Specific Assistance with Critical Control Point Determination, Verification and Validation

14. Where can small plant operators go for help in determining Critical Control Points?

Key Points noted in discussion

- Inspector and universities are sources
- Need for database, update of Ohio state document

15. For what types of products is there a need for more CCP and validation documentation?

Key Points noted in discussion

- Beef jerky
- Ethnic products (soujuk, basterma, boudin)
- Specialty salami's (dried salami, RTE chorizo)
- Niche products, but process validation is missing
- Whole muscle dried products

16. Is there a need for more statistical assistance regarding testing and validation of testing methods?

Key Points noted in discussion

There is a very clear need for this assistance. AAMP SPC computer program is easy to use. We still have additional needs for recommended/required testing frequency assistance.

17. Often plant operators are urged to refer to scientific journal articles for research that validates a process or procedure they want to use in their plant.

- Is this a realistic option?
- Why or why not?

Key Points noted in discussion

It might be possible to take a related article, and justify a decision based on technical expertise.

Additional points of discussion

- If different (process or product, article might not be helpful
- What if EIAOs are not able to make a decision?

18. How can the information in scientific journals be made to be more useful to the plant operator who needs to justify process, CCP and validation procedures?

Key Points noted in discussion

- Provide translation of articles in layman's terms (even just C vs. F)
- Copyright issues, local libraries

19. Is there anything else you would like to share regarding the availability, delivery and use of scientific/technical assistance?

Key Points noted in discussion

The agency (FSIS) needs to be aware of the diversity within small and very small plants. Small business has entire business to lose.

Additional points of discussion

- Agency is trying to move toward making decisions based on volume of product sold.
- Some issues with confidentiality



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