

Big Red Biosecurity Program

MODULE 5

Biosecurity Principles and Practices



Description of Module 5

- Module 5 reviews NPIP Biosecurity Principles 9 through 14 and provides examples of management practices and strategies to comply with these principles.
- Resources:
 - View the Official OSA Training on the NPIP Program Standards Biosecurity Principles Audit at:
<https://www.poultryimprovement.org/documents/BiosecurityPrinciplesAuditGuidelines.pdf>

Biosecurity Principle 9 – Manure and Litter Management

Manure and spent litter should be removed, stored and disposed of in a manner to prevent exposure of susceptible poultry to disease agents. Onsite litter and manure storage should limit attraction of wild birds, rodents, insects, and other animals.

Audit Guidelines—Manure and Litter Management

9.1. Is the manure and spent litter handled in a manner that limits the spread of infectious disease?

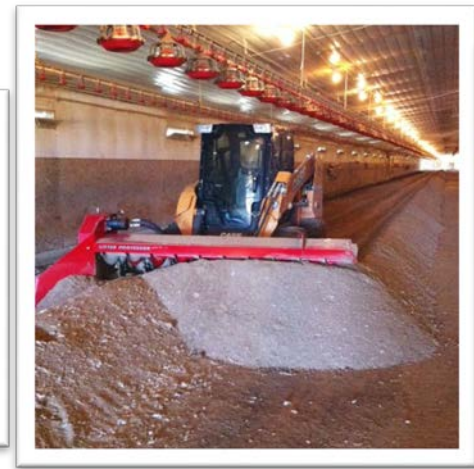
9.1.1. Procedures (e.g., written instructions, manure/litter handling log sheets, protocols, permits, guidance for contractors, etc.) should be provided showing how disease risk from manure and litter handling has been addressed.

Waste Management

Animal wastes

- Low threat = normal operation
 - Manure/litter
 - Spread on fields
 - Compost
 - In-house composting and then reuse
 - Out-of-house compost to improve nutrient value
 - People and Equipment
 - Level D PPE (i.e., coveralls, boots, gloves, etc.)
 - Equipment should be washed and sanitized after use
 - Beware that equipment and people may be shared (i.e., crews going to different farms or operations)

Waste Management



Waste Management

Animal wastes

- High threat = under quarantine situation; will be directed by authorities
 - Manure/litter
 - Composted in enclosed facility (e.g. poultry barn) and monitored

Key Points to Remember About Waste Management

Describe and Document

- Describe the procedures used for manure and litter management
 - How often is:
 - Litter/manure removed
 - Equipment cleaned and disinfected
 - Where and how spread/applied
 - Specific measures to limit spread of disease
- Document the program
 - Document procedures (e.g., log sheets of when a procedure was done)
 - Document when program is reviewed
 - If commercial company, copy of their procedure and plan
- Written in biosecurity manual

Biosecurity Principle 10 –Replacement Poultry

Replacement poultry should be sourced from health-monitored flocks which are in compliance with NPIP guidelines. They should be transported in equipment and vehicles that are regularly cleaned, disinfected and inspected. Biosecurity protocols should be in place for equipment and personnel involved in the transport of replacement poultry.

Audit Guidelines—Replacement Poultry

10.1. Is replacement poultry sourced from flocks which are in compliance with NPIP provisions and program standards?

10.1.1. Replacement poultry is defined as poultry from hatch to maturity intended to become laying hens or breeders.

10.1.2. Provide supporting documentation (e.g., VS 9-2 form, VS 9-3 form and/or NPIP hatchery production records) showing that source flocks are active and compliant participants in the NPIP.

10.2. Is replacement poultry transported in equipment and vehicles that are regularly cleaned, disinfected and inspected?

10.2.1. Supporting documentation (e.g., written instructions, wash station reports and/or logs, inspection reports, invoices, etc.) should be provided. The biosecurity plan should be followed as written and clearly define “regular cleaning.”

Audit Guidelines—Replacement Poultry, cont.

10.3. Are biosecurity protocols in place for equipment and personnel involved in the transport of replacement poultry?

10.3.1. Supporting documentation [e.g., signed statements, acknowledgement forms, visitor log-in sheets, policy documents, standard operating procedures (SOPs), Best Management Practices (BMPs), etc.] should be provided for personnel involved in the transport of replacement poultry.

10.3.2. Supporting documentation [e.g., written instructions, protocols, procedures, training videos, standard operating procedures (SOPs), Best Management Practices (BMPs), etc.] should be provided for equipment involved in the transport of replacement poultry.

Key Points to Remember About Replacement Poultry

Replacement Poultry

- Defined as birds raised to be used for egg laying and breeding purposes
 - These birds need to come from NPIP participant flocks
 - Document with appropriate form
- Transport vehicles and equipment
 - Biosecurity program/plan specific for vehicles and equipment
 - Regularly cleaned and disinfected
 - Quality control program – testing for specific agents (e.g., *Salmonella* spp)
 - Written Standard Operating Procedures (SOPs) and Best Management Practices (BMPs)
- Personnel
 - Biosecurity program/plan in place for personnel
 - Document activities (e.g. log sheets, training, policy updates)
 - Written Standard Operating Procedures (SOPs) and Best Management Practices (BMPs)
 - Document compliance and corrective actions for noncompliance
- Written in biosecurity manual

Biosecurity Principle 11 – Water Supplies

It is recommended that drinking water or water used for evaporative cooling be sourced from a contained supply such as a well or municipal system. If drinking water comes from a surface water source, water treatment must be used to reduce the level of disease agents. If surfaces have been cleaned or flushed with surface water, subsequent disinfection should be employed to prevent disease transmission. If water treatment is not possible, a risk analysis should be performed to determine actions needed to mitigate risks.

Audit Guidelines—Water Supplies

11.1. Is drinking water or water used for evaporative cooling sourced from a contained supply such as a well or municipal system?

11.2. If water comes from a surface water source, is water treatment used to reduce the level of disease agents?

11.2.1 If yes, describe the water treatment used.

11.3 If water treatment is not possible, is a risk analysis performed to determine actions needed to mitigate risks?

11.3.1 The Biosecurity Coordinator should provide evidence that the risk of an untreated system has been considered and demonstrate steps to mitigate that risk if feasible.

11.3.2 Risk assessment should have considered risks from the water supply. This guidance does not require a peer-reviewed professional risk assessment to be performed.

Audit Guidelines—Water Supplies, cont.

11.4 If surfaces have been cleaned or flushed with surface water, is subsequent disinfection employed to prevent disease transmission?

11.4.1 If surfaces were cleaned or flushed with surface water and subsequent disinfection was employed, a description of the subsequent disinfection and/or supporting documentation should be provided (e.g., invoices for chemicals used and purchased treatment equipment, treatment plans, etc.)

11.4.2 If surfaces were cleaned or flushed with surface water and subsequent disinfection was not employed, see item 11.3.2 above.

Management Practices—Water

- Guiding principles
 - Animals drink more than they eat
 - Need to consider water as a vector for disease
 - Water treatment vs water disinfection
 - Water treatment = water quality, animals perform at full genetic potential
 - Water disinfection = eliminating pathogens
- Water sources
 - Well – typical primary source rural
 - Municipal water – typical source urban
 - Surface – pond or stream / river
 - Other – cistern, piped in (rural water)
- Consider problem and practical solutions
 - Range animals or animals housed outdoors – may be a challenge

Approach to Water Problems

- Determine the problem (pathogen) to be resolved / targeted
 - Start with a water sample
 - Determine water quality – pH, solids, minerals, Coliforms, etc.
- Determine the plumbing/watering system and its limitations
 - Elaborate drinking system with water monitoring, conditioning and medicator
 - Pans in a pen
- Establish a plan/strategy for disinfection
 - Economically feasible
 - Anyone/everyone at facility understands, can comply and can achieve goals
 - Use chemicals that are EPA registered, approved and use by label directions
 - Follow-up and reevaluate water and the plan

Chemical Disinfection of Water

DISINFECTANT CHEMISTRY	LEVEL RECOMMENDED FOR FIELD USE
Chlorine (Gas, Bleach)	3-5ppm "Free" Chlorine with pH<7
Chlorine Dioxide	3-5ppm total "Stabilized Chlorine Dioxide"
Peroxide	30-70ppm
Iodine/Iodophor	Refer to product label
Acid	pH<4.5 depending on acid

Figure 11: Quick References Of Chemical Levels In Lines For Residual Disinfection

Chlorination—Most Commonly Used

- Supplied in different forms
 - Liquid – bleach
 - Solid – pucks (e.g., swimming pools)
 - Gas
- Chlorine products pH dependent
 - Chlorite ion OCl^- at high pH
 - Hypochlorous acid HOCl at low pH
- Relatively safe
 - Caution with chlorine gas
 - Bleach used by outdoor enthusiasts for treating drinking water

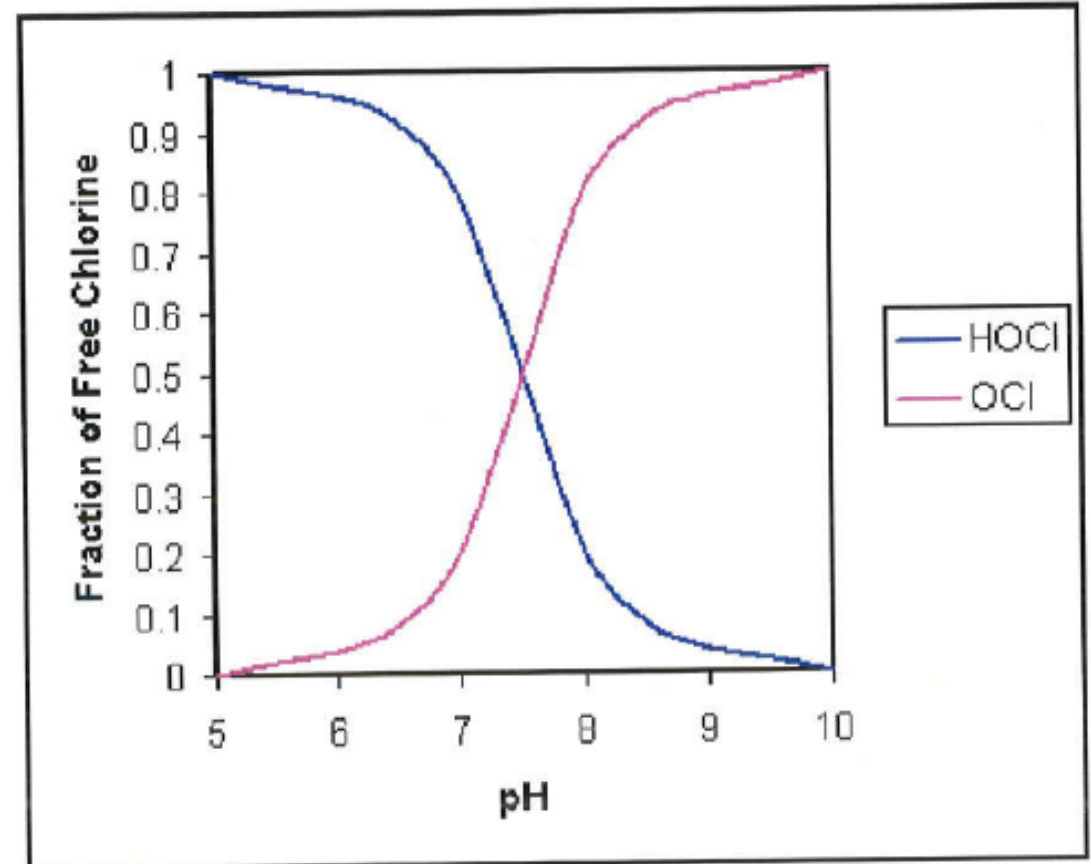


Figure 9: Chlorine Relationship to pH

Chemical Disinfection of Water

<i>Acanthamoeba castellani</i> ¹²	Echovirus ³¹	Norwalk Virus ¹⁵
Actinomycetes ¹³	Eikelboom type 021N ¹⁴	Polio virus ¹⁵
Adenovrus ¹⁵	Entamoeba histolytica ¹⁶	Pseudomonas aeruginosa ²¹
Aspergillus niger ¹⁷	Giardia ¹⁸	Rhodotorula flava ¹⁹
Bacillus Lichenformis ²⁰	Gram Positive spore forming bacilli ¹³	Rotavirus ¹⁹
Bacillus Subtillis ²¹	Hepatitis A ²²	Salmonella enterica Serovar Typhimurium DT104 ²³
Biofilm Bacteria ²¹	Klebsiella pneumoniae ²⁴	Snow Mountain Agent Virus ¹⁵
Campylobacter jejuni ²⁵	Listeria monocytogenes ²⁶	Tetrahymena pyriformis ¹²
Clostridium botulinum ²⁷	Methylobacterium ²⁸	Thiothrix spp. ¹⁴
Clostridium perfringens ²⁹	Micrococci ¹³	Toxoplasma gondii ³⁰
Coxsackie Virus ³¹	Mycobacterium chelonae ¹⁹	Vibrio Cholerae ²³
Cryptosporidium ³²	Mycobacterium fortuitum ¹⁹	Yersinia enterocolytica ¹⁷
Escherichia coli ³³	Noroviruses ¹⁵	Legionella pneumophila ³⁴

Figure 10: Pathogens With Shown Chlorine Resistance

Other Methods of Water Disinfection

- Filtration
- Heat – boiling, autoclaving
- Ozone
- Ultraviolet light

Information Resources

- University extension services
- Commercial companies
- Federal services
 - EPA
 - CDC



Key Points to Remember About Water Supplies

- Water uses
 - Drinking
 - Evaporative cooling
 - Cleaning of facilities, equipment, etc.
 - Personnel use (e.g. toilets, showers, washrooms)
- Water source
 - No problems or concerns if:
 - Water comes from subsurface (e.g., well)
 - Typically tested negative for coliforms upon initial use
 - Municipal water system (has been professionally treated)
 - Concerns if:
 - Surface water used (e.g., pond, stream)
 - Describe and document water treatment used
 - If no water treatment:
 - Demonstrate steps to mitigate risk
 - Risk assessment should be performed
 - If surface water used for cleaning:
 - Then the disinfection procedure needs described and documented
 - If no disinfection procedure used then risk assessment as above

Biosecurity Principle 12 – Feed and Replacement Litter

Feed, feed ingredients, bedding, and litter should be delivered, stored and maintained in a manner that limits exposure to and contamination by wild birds, rodents, insects, and other animals. Feed spills within the PBA (outside of the LOS) should be cleaned up and disposed in a timely fashion.

Audit Guidelines—Feed and Replacement Litter

12.1. Is feed, feed ingredients and litter stored and maintained in a manner that limits exposure to and contamination by wild birds, rodents, insects, and other animals?

12.1.1. Guidance applies to the feed ingredients and litter which are under the direct control of the entity being audited. A description or examples (e.g., written instructions, feed or replacement litter handling, log sheets, protocols, permits, guidance for contractors, etc.) should be provided showing how exposure to and contamination by wild birds, rodents, insects, and other animals is limited. Occasional exceptions may be necessary (e.g., seasonal storage, acts of God, etc.).

12.1.2. Guidance applies to the feed ingredients and litter which are under the direct control of the entity being audited.

12.2. Does the biosecurity plan address feed spills within the PBA (outside of the LOS)?

Management Practices — Food and Feed

Approach

- Determine the problem
 - Health problem for the animal
 - Feed formulation problem (e.g., nutritional deficiency)
 - Feed toxicity (e.g., mycotoxins, wrong formulation, contaminant)
 - Infectious disease (e.g., Salmonellosis)
 - Contaminated feed (e.g., hardware disease)
 - Food safety concern (e.g., *Salmonella spp* in poultry)
 - Is feed the origin of the problem
 - Is feed contributing to the problem
 - Determine the pathogen(s) involved

Approach to Feed Problems

- Determine the problem (pathogen) to be resolved / targeted
- Start with a feed sample
 - May request nutritional feed analysis
 - May request microbiological determination
 - May request specific toxin analysis
 - Etc.
- Determine the feeding system and its limitations
 - Elaborate system with monitoring
 - Pans in a pen
- Establish a plan / strategy for safe feed
 - Involving feed mill / manufacturer a must
 - Involve nutritionist
 - Economically feasible
 - Follow up and reevaluate

Things You Should Know About Modern Feed Mills

Traditionally feed mills practiced Good Manufacturing Practices (GMPs)

- Food Safety Modernization Act (FSMA) became law in January 2011
 - GMPs revised and now are called Current Good Manufacturing Practices (CGMPs)
 - Mills must have a Hazard Analysis Critical Control Point (HACCP) plan incorporating International Organization Standards (ISOs); a biosecurity program required
 - Regulatory authorities involved – FDA, USDA, Homeland Security
 - Must update facilities and practices for “food production” instead of “feed manufacturing for animals”

Principles of the HACCP

1. Conduct a hazard analysis that relates to all steps in the process.
2. Determine the critical control points (CCPs) required to prevent and control the identified hazards.
3. Set critical limits, which must be met at each identified CCP.
4. Establish procedures to monitor critical limits (what, why, where, who and when must be answered).
5. Determine corrective action to be taken during monitoring. This step indicates that there is a deviation from an established CCP.
6. Establish effective record-keeping systems that document the HACCP plan.
7. Create procedures to verify that the HACCP system is working.
8. Assign risk and frequency variables to established CCPs to establish a risk weighting.

Biosecurity for Feed and Feedstuffs

- Feed mill biosecurity – frequent sources of pathogen introduction
 - Personnel
 - Visitors
 - Feed ingredients
 - Airborne particles (i.e., dust)
 - Pests (i.e., rodents, birds, insects)
 - Equipment
 - Lubricants
 - Moisture
 - Personnel
- Facility design for pretreatment (dirty) and post-treatment (clean) areas
- Employee training essential and mandatory

Biosecurity for Feed and Feedstuffs, cont.

- Environmental monitoring for pathogen(s)
- Feed hygiene
 - Sanitizing / decontaminating feed post-processing
 - Heat – time, temperature, moisture, pressure
 - Many types of commercial processes / technologies and affiliated equipment are available
 - Heat also breaks down and changes nutrients such as vitamins, proteins and starches
 - Note – once thought that pelleting decontaminated feed – helps but not fully effective
 - Chemical
 - Acids – propionic, acetic, and formic
 - Formaldehyde products
 - How products are applied to feed is an important consideration
 - Assessment of chemical and/or heat treatment (i.e. excessive monitoring)
 - Microbiological evaluation

Biosecurity for Feed and Feedstuffs, cont.

- Feed ingredient selection—e.g., certain ingredients historically have high level of *Salmonella spp* contamination
 - Animal byproducts
 - Fish meal
 - Vegetable oils
 - Cereals

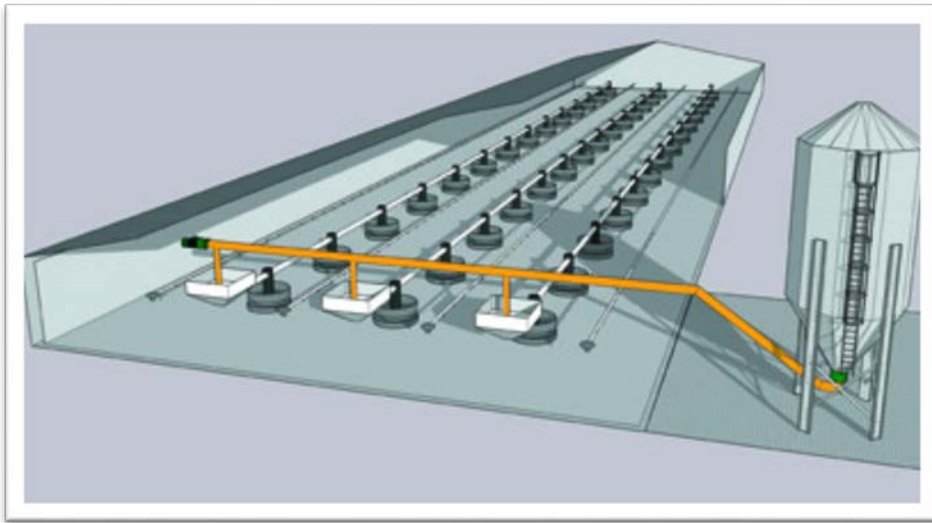
Post-treatment Feed Concerns/Issues

- Feed storage
 - Pre-delivery
 - Onsite storage
 - Buildings
 - Feed bins
- Feed delivery
 - Trucks may contaminate feed
 - Trucks and drivers may serve as vectors for pathogens
- Feeders and feed systems
 - Should be clean and functioning
 - Should be insect/rodent/wild animal resistant/proof
 - Old feed should be discarded and not reused
 - Plan/procedure for cleaning up feed spills
- Employees and personnel should be trained and in compliance

Feed Storage



Feed Delivery



Information Sources

- Feed manufactures
- Nutritionists
- Universities
- Federal and state agencies

Key Points to Remember About Feed and Replacement Litter

- Feed and litter storage
 - Document and describe
 - Where and how feed/litter is stored
 - Map/diagram of site may be useful
 - Indicate measures for monitoring and controlling pests and vermin (e.g., rodents, insects)
 - Written guidelines/protocols
 - How feed/litter is delivered
 - Who delivers
 - Log sheets
 - Biosecurity measures between deliveries
 - Protocols for delivery vehicles
 - Protocol for handling feed spills
 - Signage may be useful

Biosecurity Principle 13 — Reporting Elevated Morbidity/Mortality

Elevation in morbidity and/or mortality above expected levels, as defined by the biosecurity plan, should be reported as required in the site-specific biosecurity plan and appropriate actions should be taken to rule out reportable disease agents.

Audit Guidelines—Morbidity/Mortality

13.1. Does the biosecurity plan address elevated morbidity and/or mortality above expected levels?

13.1.1 A description of the actions and/or documentation (e.g., evidence of investigation, tracking graphs, mortality/morbidity patterns, case reports, mortality logs, etc.) used to monitor morbidity and/or mortality should be provided. The Biosecurity Coordinator is responsible for communicating what constitutes elevated morbidity and/or mortality in the biosecurity plan.

13.2. Is there a plan to report to responsible authorities and take appropriate action should you suspect and need to rule out reportable disease agents?

13.2.1. Provide the written procedure to report and take appropriate actions when disease agents are suspected. The Biosecurity Coordinator is responsible for providing the written procedures.

13.2.2. The written procedure should identify the responsible reporting authorities. The Biosecurity Coordinator is responsible for clearly communicating who the responsible authorities are.

Key Points to Remember About Morbidity/Mortality

Document and Describe

- How is elevated morbidity/mortality determined?
 - Daily/weekly morbidity/mortality logs/charts/records
 - Graphs/investigation reports / etc.
- Who determines elevated morbidity/mortality?
 - What is acceptable/normal morbidity/mortality?
 - Should be written in biosecurity manual
- When morbidity / mortality is elevated and infectious disease is suspected
 - Who determines?
 - What actions are to be taken?
 - Report to whom?
 - At least two contacts should be listed – One primary and one backup
 - Full contact information needs to be written down and updated periodically
 - If a reportable disease suspected (i.e., avian influenza or exotic Newcastle disease)
 - Biosecurity coordinator is responsible for communicating who the responsible authorities are and having contact information
 - Typically this is the state veterinarian (office)
 - What actions are to be taken during the interim period?
 - Should be written in biosecurity manual (e.g. increased threat level)

Biosecurity Principle 14 – Auditing

Auditing of the biosecurity principles is based on flock size as outlined in 9 CFR 53.10. Audits shall be conducted at least once every two years or a sufficient number of times during that period by the Official State Agency to ensure the participant is in compliance. Each audit shall require the biosecurity plan's training materials, documentation of implementation of the NPIP Biosecurity Principles, corrective actions taken, and the Biosecurity Coordinator's annual review to be audited for completeness and compliance with the NPIP Biosecurity Principles. An audit summary report containing satisfactory and unsatisfactory audits will be provided to the NPIP National Office by the OSAs.

Those participants who failed the initial document audit conducted by the NPIP OSA may elect to have a check audit performed by a team appointed by National NPIP Office including: an APHIS poultry subject matter expert, the OSA, and a licensed, accredited poultry veterinarian familiar with that type of operation. If these participants seek to be reinstated as being in compliance with the Biosecurity Principles by the NPIP OSA, they must demonstrate that corrective actions were taken following the audit by the team appointed by NPIP.

Who is Exempt From Audits?

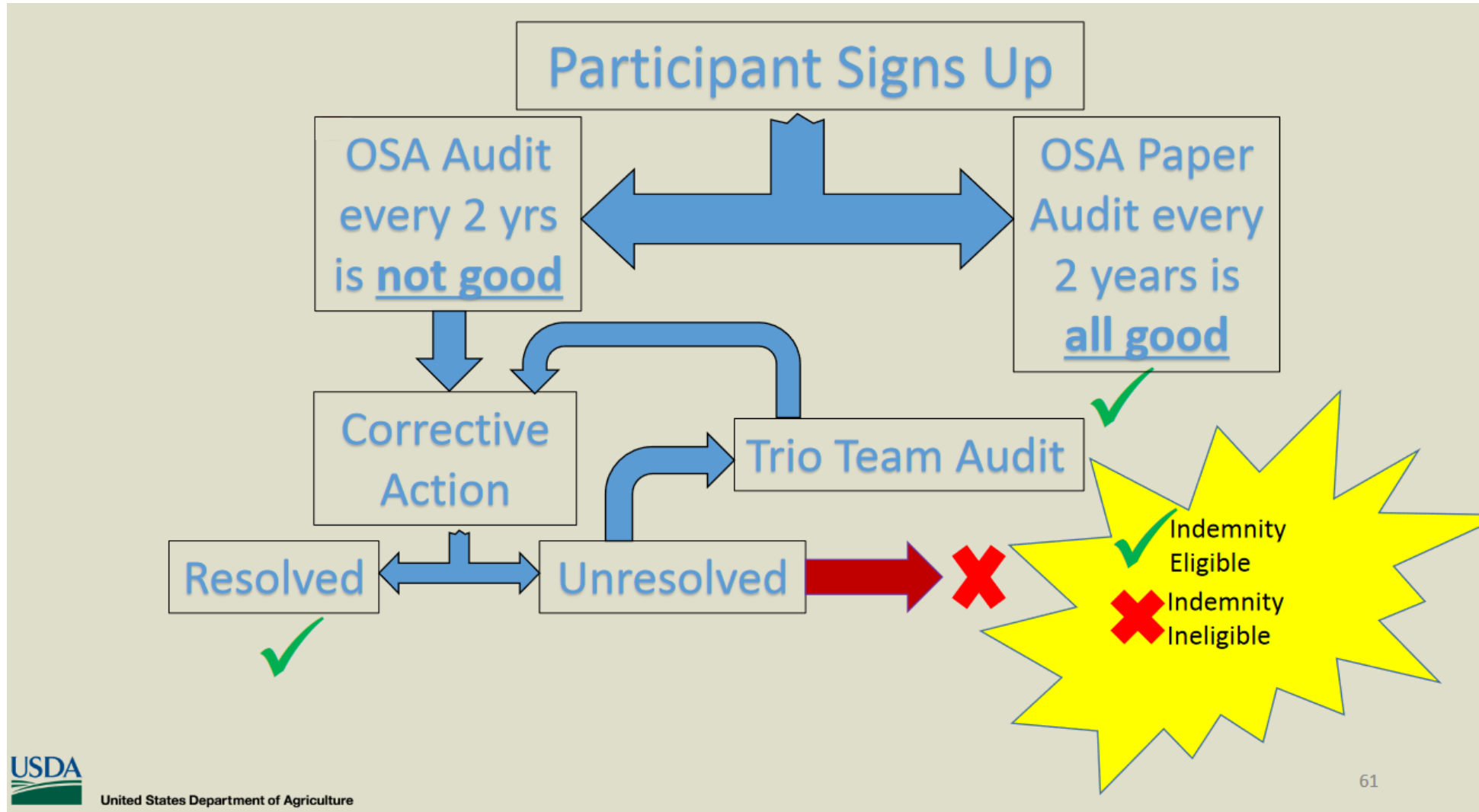
Producers EXEMPT from AUDITS:

- < 75,000 commercial egg layers on premises
- < 100,000 broilers slaughtered/yr
- < 30,000 turkeys slaughtered/yr
- < 50,000 waterfowl or upland game birds slaughtered per year
- < 25,000 game birds raised for release per year
- Small flock owners that do NOT meet the minimum inventory requirements are eligible for up to 100% HPAI indemnity.

- This is different from the NPIP Size Requirements to participate in 9-CFR Part 146 Commercial Poultry H5/H7 Avian Influenza Monitored Program.

No producer is exempt from having a biosecurity plan – regardless of inventory!

Biosecurity Principles Auditing Decision Tree



Key Points to Remember About Auditing

- Auditing
 - Who does the auditing?
 - The Official State Agency (OSA - typically the state veterinarian's office)
 - When will the audits be conducted?
 - At least once every two years
 - What will be audited?
 - Training materials
 - Documentation of the implementation of NPIP biosecurity program principles
 - Any corrective actions taken
 - Biosecurity coordinator's annual review
 - Completeness of NPIP biosecurity program principles
 - Compliance with NPIP biosecurity program principles

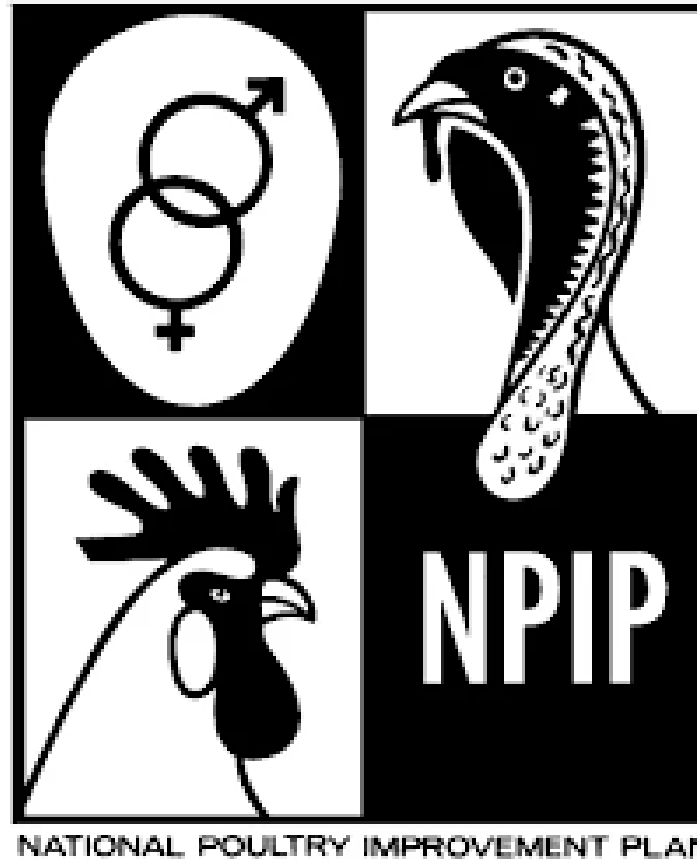
Key Points to Remember About Auditing, cont.

- What are the results and then what happens?
 - The audits will be deemed satisfactory or unsatisfactory by the auditor
 - A summary report will be submitted by the OSA to the NPIP National Office
- What happens if you fail the audit?
 - Elect to have another audit performed
 - A team appointed by NPIP will conduct the audit
 - Must demonstrate corrective actions cited by the audit team
- Who is exempt?
 - Small producers are exempt but still qualify for indemnity payments for HPAI
 - All producers need a biosecurity plan regardless of size

NPIP Contact Information

Questions about NPIP?

The National Poultry Improvement Plan
1506 Klondike Rd. Suite 101
Conyers, Georgia 30094
Phone: 770-922-3496
Fax: 770-922-3498



End of Module 5