Food Safety in Bulk Grains: Developing Food Safety and Recordkeeping Plans

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FOOD SAFETY RISK

Aspergillus ear rot
ISU Extension and Outreach

Aflatoxin
http://www.amlan.com/myco-dairy.html
Recalls

- Four recalls for dry pet food with aflatoxin from Dec. 6th, 2011-Dec. 14th, 2011 in the United States
- October 2011 recall of Thumb Oilseed soy flour and meal due to *Salmonella* contamination
- 2009 Nestle cookie dough *E.coli* O157 outbreak linked to raw flour
FDA Steps Up Salmonella Testing for Pet Food

• FY 2012 Nationwide Assignment to Collect and Analyze Samples of Pet Foods, Pet Treats, and Supplements for Pets from Interstate Commerce in the United States for Salmonella

• Date: October 24, 2011
Survey Data

• Low prevalence of *Salmonella* in grain industry
• Mycotoxin presence is dependent on weather and season
• But they are PRESENT and they are RISK

*Salmonella* spp.
New Regulations

• The FDA Food Safety Modernization Act (FSMA) was signed into law by President Obama on January 4th, 2011

• It aims to ensure the U.S. food supply is safe by shifting the focus of federal regulators from response of problems to contamination to preventing
Low Risk and High Risk Food

• Based on

  1. Known safety risks of a particular food, including the history and severity of foodborne illness outbreaks

  2. Likelihood that a particular food has a high potential risk for microbiological or chemical contamination or would support the growth of pathogenic microorganisms
Low Risk and High Risk Food

3. Point in the manufacturing process of the food where contamination is most likely to occur;
4. Likelihood of contamination and steps taken during the manufacturing process to reduce the possibility of contamination;
5. Likelihood that consuming a particular food will result in a foodborne illness
6. Likely or known severity, including health and economic impacts
Your Action Items

1. RISK BASED HAZARD ANALYSIS
2. TRACEABILITY
3. RECORD KEEPING
WHO IS IMPACTED

• Everyone!!!!
  – Domestic
  – Foreign (Imports)
  – Directly
  – Indirectly
IMPACTS ON GRAIN INDUSTRY
Impacts

• Farm to Fork Principle
• Hazard Analysis and Risk Based Preventive Controls (Food Safety Plan)
  – Traceability of your suppliers, customers
  – Testing (product or environment)
  – Series of Written Policies
  – Record Keeping System
Farm to Fork Principle

• Spread the risk throughout the food chain
• Ability to eliminate to identify potential
  – Not farmers A→X, it could be Y and Z
• Reach back verification system
  – Multiple farmer suppliers verification
Sec. 103: Hazard analysis and risk-based preventive controls

- Requires human and animal food facilities to:
  - Evaluate hazards that could affect food safety;
  - Identify and implement preventive controls to prevent hazards;
  - Monitor controls and maintain monitoring records; and
  - Conduct verification activities.

Slide from FDA FSMA: Focus on Prevention Power point
FOOD SAFETY PLAN NEEDS
How do I make Food Safety Plan?

1. Food Safety Team
2. Identify your hazards
3. Create a Flow Diagram
4. Create Written Documents on your Policies related to that Program
5. Record Keeping System
Food Safety Team

- Consisting of:
  - All areas of production (include suppliers and buyers)
  - Constant members (supervisors)
  - Rotating members (fresh eyes and energy)
Identify Hazards

• Good Agricultural Practices- How you grow your grain?
• Good Manufacturing Practices- After it leaves your facility, how is it processed?
• Sanitation-How you are cleaning up biological, physical, and chemical hazards?
• Environmental monitoring- What test are you running on your product?
Additional Items to consider

• Food allergen control- How are you ensure purity of product?
• Recall plan- Do you have a method to trace product from farm through elevator?
• Supplier- What risk are you placing on your farmers or suppliers?
• Quality Management Plan- Which one are you following?
Quality Management Plan

- Facilities/equipment
- Raw materials handling and control
- Chemical control
- Pest management
- Receiving, storage, and distribution
- Recall and traceability
- Training management
Flow Diagrams

- Farm through the end user
- More details the better the chart works
- Includes all suppliers, flow throughout plant with possible deviations, trucking, suppliers
Food Safety Plan/ Risk-based Preventive Plan

• Based on Prevention (Known or reasonably foreseeable hazards)
  – Biological contamination: bacteria, virus, yeast, molds, toxins, etc.
  – Physical: glass or other foreign materials
  – Chemical: sanitation, ingredients
  – Allergens: proper allergen warnings
  – Radiological: X-ray, additives, technology
Maintenance & Sanitation
Coal

Asbestos

Glass

Dead vermin

Pictures from Charlie Hurburgh, Iowa Grain Quality Initiative
Potential Hazards: Biological

- Mycotoxin
- Vector: The plant
- Related to the weather and environment
- Food-borne mycotoxins are acute, symptoms of severe illness appearing very quickly
- U.S. Food Law (FSMA) covers mycotoxin through the reportable food registry
  - Not sure how the gov’t will handle high prevalence years
Potential Hazards: Biological

- *Salmonella*, *E.coli* O157:H7
- Vectors: pest, environment, humans, facility, trucks
- Examples:
  1. Mice and bird dropping carry bacteria
  2. Crops can harbor bacteria
  3. Trucks and structure
Mice and bird dropping carry bacteria

- Harbor *Salmonella* and *E. coli O157:H7* in their GI Tract
- Droppings are everywhere
  - Sanitation policy
- Regular pest management program
- Keep doors closed
Potential Hazards: Physical

- Glass
- Metal
- Wood
- Stone
- Structural parts
- Animals?

http://www.pandscorp.org/riverdebri.html
**Structure**

- Leaks
- Broken Lights
- Door Locks
- Farm Security

- Intentional and Unintentional contamination
Potential Hazards: Chemical
Transportation

• Important to know the previous loads
• Important to set standards for farmers and transportation companies
• Documentation/Traceability
• Sanitation
  – Sweeping may not be enough in the future
  – Thorough cleaning of truck beds, trains, and bins is critical
Potential Hazards: Allergen

- Management is critical if you process multiple allergens
- Cross contamination is a cause for a recall
- Buyers want PURITY of product
  - Beyond grade standards

Figure 1: The “Big Eight” Allergens: Tree Nuts, Peanuts, Soy, Egg, Milk, Fish, Wheat and Shellfish.

http://www.foodsafetymagazine.com/article.asp?id=2645&sub=sub1
Written Document

- Computer document (easy to edit)
- Write Standard Operating Procedures (SOP) for each program
- Identify purpose of the SOP
- Who will perform the task
- How frequent the task will occur
- How is the item checked
- How records are utilized
Example SOP

- **PURPOSE:** To prevent mice infestation
- **WHO:** Pest control officer or designee
- **Frequency:** Quarterly inspections
- **Documentation:** Record how many mice are caught

**INSTRUCTIONS**

1. Quarterly inspections will occur or as needed
2. Employees will be vigilant of mice increases
3. Doors to silos will be secured when not in use
4. No loose or piles of grain will be placed around farm
5. Caught will be recorded
Record Keeping System

- Easy to Use
- Easy to Monitor
- Easy to prove Control
- SOMEONE HAS TO LOOK AT RESULTS AND USE THE RESULTS
- Results means $$ because become more efficient with resources
- Traceability is the Key
Supplier verification

• In a recall, who is to blame
• Confidence that your food safety standards are being applied
  – What are your policies?
  – Audits? Record keeping?
  – Clean truck (example no meat products)?
  – If you had knowledge of a food safety threat then declaration?
Traceability

• Method to trace the grain in each truck as it moves through your facility (cannot be perfect)
  – When it first enters what bin did it go in
  – If it is moved, where is the product now
  – If it is shipped, whose product is present in the shipment

Ability to eliminate as many farmers if a recall occurs
Recall plan (voluntary/mandated)

- Traceability
- Updated contact information of all suppliers
- How to handle media
  - Spokesperson (special qualities)
- Do a MOCK recall and see how good you are?
Conclusion

• Traditionally grain industry has little concerns with food safety hazards but this has changed
• Food Safety is now priority for FDA and USDA
• Three Key Words
  – Risk Based Hazard Control (Food Safety Plan)
  – Traceability
  – Record Keeping

This will become part of a formal quality management system
Contact Information

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