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## How To Make A HACCP Plan Work In A Feed Mill

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### **INTRODUCTION**

In the last few years we have seen food contamination outbreaks in North America and Europe. In reaction the food industry has tightened quality control procedures and traceability to reduce health risk and satisfy consumer demands for safer food. Agriculture is an integral part of the food chain. The market driven attitude of the food industry regarding food safety has been driven back to the agriculture sector from primary breeding, to live production and live haul, to feed, and finally to grain production. Hazard Analysis Critical Control Point (HACCP) has become an integral part of the new food safety laws. HACCP is internationally recognized and accepted by the World Trade Organization. So far HACCP is not mandatory throughout the agricultural chain but will most likely become mandatory if companies are to continue to do business locally and internationally.

The potential for the introduction of contaminants (microbiological, chemical, or physical) to eggs, beef, poultry, and pig meat from feed is real. Two most recent examples are in Canada (medicated feed was fed to pigs before slaughter) and the Benelux (dioxin in feed). Traditionally feed mills successfully implemented Good Manufacturing Practices (GMPs) to produce feed clean of contaminants thus protecting raw foods of animal protein. However, to increase the safety margin in the production of raw animal proteins and to regain consumer trust, HACCP implementation in feed mills is becoming a necessity.

### **STEPS FOR FEED MILL HACCP IMPLEMENTATION**

#### *Company vision and management commitment*

In the early to mid 1990's, our company considered HACCP and ISO implementation a possible competitive advantage in North America and a necessity for gaining European business. Our product is produced in North America and is marketed across the world. Thus HACCP and ISO implementation were necessary to produce a product that could be marketed locally and across international borders. Our general manager and the senior management team were willing to commit the resources for successful HACCP and ISO implementation throughout the company including the feed mill.

#### *Feed mill HACCP team*

Team members were selected based on their professional background, experience, and degree of involvement in the production process. The team members were: feed mill manager, feed mill quality control manager, feed mill production manager, government feed mill inspector, food production specialist with HACCP implementation experience, epidemiologist, veterinarian, and nutritionist.

Two meetings and a feed mill visit took place before any actual HACCP prerequisite work was initiated. The following was discussed:

- The basic principles of HACCP (Table 1).

- The function and responsibility of every professional in the team.
- The time commitment needed to complete the process.
- A discussion about the feed milling process.
- Who will cover the financial costs?
- What will be a good starting point – GMPs, or is there another option?
- What information/documents are needed?

Table 1. Hazard Analysis Critical Control Points Principles

PRINCIPLE #	DESCRIPTION
1	Conduct a hazard analysis that relates to all the steps in the process
2	Determine the critical control points (CCPs) required to prevent and control the identified hazards
3	Establish critical limits, which must be met at each identified CCP
4	Establish procedures to monitor critical limits (what, why, how, where, who, and when must be answered)
5	Establish corrective action to be taken when monitoring indicates that there is a deviation from an established critical control point
6	Establish effective record keeping systems that document the HACCP plan
7	Establish procedures for verification that the HACCP system is working

*Verification of HACCP prerequisites*

The team decided to use the feed mill Good Manufacturing Practices (GMPs) and Standard Operating Procedures (SOPs) as a starting point for verification and to learn about the feed milling process. Each area of the milling process was evaluated individually. Each area was discussed and the SOP was written. The written SOP procedures were modified to include title, page number and total number of pages, approval, revision, issue date, references, policy, procedure, deviation and corrective action, verification, supporting records and documents, and finally visually inspected. The following areas were evaluated:

- **Premises** – This covers the building exterior and grounds, feed mill interior, lighting, dust collection, waste disposal, employee facilities, water, and boiler.
- **Receiving, storage and transportation** – This covers incoming and outgoing carrier inspection, receiving area design, ingredient inspection, purchasing, warehousing, medication handling, bin storage, return and rework, chemical management.
- **Equipment** – This covers equipment design/purchase, scale calibration, mixer validation, and preventative maintenance.
- **Housekeeping and pests** – This covers housekeeping and pest control.
- **Personnel** – This covers personnel training and visitors policy.

- **Manufacturing controls and documentation** – This covers sampling procedures, sequencing and flushing, daily medication reconciliation, identification of lots, label review, master formula, and customer complaints.
- **Recall** – This covers the recall procedures.

*Verification of documentation and the product flow*

The HACCP team performed an on-site review to evaluate the accuracy of the changes made (employee flow, sampling accuracy and procedures, documentation, employee interviews) and the completeness of the product flow.

*HACCP plan*

- **Hazard analysis** – It is very important that the hazard analysis is done correctly and systematically. If the HACCP team misses or omits a hazard that requires control within the HACCP plan, the plan will be ineffective regardless of how accurately the feed mill employees and managers follow the plan. The hazards were identified as biological, chemical or physical. Documentation of how these hazards may be introduced, controlled, or increased throughout the production process was completed. All incoming ingredients and all processes in the product flow were evaluated to determine the likelihood of any biological, chemical or physical hazards. Some of the questions asked were:
  - Do the incoming ingredients contain any hazard, either biological (e.g. salmonella), chemical (e.g. pesticide or mycotoxins) or physical (e.g. stones or metal), and where can it be controlled?
  - Do the conditioner and pelleter provide the time and temperature needed to control salmonella?
  - Does the employee traffic pose a significant source of feed mill environment contamination?
  - Do the employees understand the process and the importance of what they do to produce hazard-free feed?
- **Critical control points (CCPs)** – A control that is essential to prevent or eliminate a hazard or reduce it to an acceptable level is referred to as a critical control point.
- **Establish critical limits** – Once the critical control points are established, the HACCP team identified the minimum/maximum value needed to prevent, eliminate or reduce hazards to an acceptable level. These limits must be supported by scientific in-house or literature research.
- **Establish monitoring procedures** – Planned observation or measurements were identified for every CCP. Persons responsible for the observation or measurement were identified and were trained (if needed) on how to conduct the job. Moreover, the employees were empowered to accurately report their observations and to implement adjustments (if properly trained) in a timely manner to produce hazard-free product.
- **Establish corrective action** – Deviations from established procedures will most likely occur. Thus it is important to implement corrective action quickly. The HACCP team developed specific corrective actions for each CCP in the HACCP plan. These actions identify what is going to be done to correct the situation, who is responsible and accountable

for the correction, and make sure that the records are complete and accurate.

- **Establish verification** – The feed mill manager or the trained employee will verify each CCP at specific time intervals (weekly, monthly, etc.).
  - Calibration of equipment such as temperature, weight, flow, etc.
  - Review of monitoring and corrective action records.
  - An independent check on the adequacy of the control procedures. These tests are done independently of the routine monitoring procedures to determine that the identified hazard is properly controlled.
  
- **Establish record keeping systems that document the HACCP plan** – This will include records such as supplier's certifications, storage records, monitoring records, verification records, weekly inspection sheets, etc.

#### *Verification of the HACCP plan*

This involves two parts: 1) review of records, and 2) on-site inspection. In our case external auditors were used to verify the HACCP plan. The initial audit was planned. Feed mills with a newly developed HACCP plan should start with a planned high audit frequency (bimonthly or quarterly) to ensure adherence of the HACCP system to the plan. Occasional unplanned audits to inspect certain activities could also be beneficial. The audits should be viewed as a report card. They identify deficiencies that need to be corrected, provide recommendations for improvements, and provide management at all levels with a comfort level about the ability of feed mill to produce a product free of any hazards.

## **CONCLUSIONS**

The feed mill management indicated that the implementation of HACCP improved and centralized their records, improved their confidence in recall procedures if needed, and gained customer confidence. In the long run they believe that production efficiency will improve because better maintenance records will lead to less breakdown.

Changing government policies in response to consumer demand for safer food will most likely change the way agribusiness companies conduct their activities. Food processors are demanding high quality safe animal proteins from their agribusiness suppliers. To meet these demands, we have to implement procedures such as HACCP to improve our ability to produce safe raw inputs that ensure consumer satisfaction and trust.