INTRODUCTION

A feed mill quality assurance (QA) program ensures that any feed produced conforms to the company’s nutritional and physical specifications when the product is sold or delivered. Quality assurance requires a comprehensive approach that encompasses the people, policies, and procedures involved in each stage of production—from purchasing ingredients to delivering the feed to a customer or farm. The content and details of a QA program will be based upon each company’s needs and goals, and the equipment and manufacturing processes in the feed mill.

An effective QA program addresses all phases of production—from a mill’s quality specifications for ingredients and their traceability, through manufacturing processes and packaging, to finished feed delivery. It defines critical control points for evaluating product quality. A QA program also incorporates regulatory requirements and any third-party certification program requirements (HACCP, ISO 9001 and 1400, USDA Certification, and Safe Feed/Safe Food) in place at the feed mill. A comprehensive QA program will include employee training and a QA manual that defines standard operating procedures, critical control points, sampling and analytical schedules, reporting systems, and review processes.

GOALS AND OBJECTIVES

The goals defined in a company’s business model will determine many of the policies and procedures in its QA program. These objectives must be met to either maximize sales or optimize the production of meat, milk, or eggs. In addition to meeting the goals of the company’s business model, the QA program must also ensure the production of safe feed.

Certification programs—such as Safe Feed/Safe Food (SFSF) offered by the American Feed Industry Association—require feed mills to develop QA teams, create mission statements, and set quality goals as part of the certification process. These requirements provide guidance to employees and illustrate the company’s...
commitment to producing high-quality safe feed products. Solicit the advice of feed mill managers, nutritionists, veterinarians, sales personnel, and animal production specialists during the development of purchasing specifications and feed processing parameters. Their knowledge is critical to developing a QA program that will increase sales, optimize animal performance, and maximize profits—based on specific market demands and the design of the animal production systems being served.

PROGRAM COMPONENTS

Employee Training
Make QA training part of orientation for new employees. Follow up with regular training updates and annual certification based on the requirements of each job description. The Food and Drug Administration (FDA) requires training for all employees manufacturing medicated feed. Employee responsibilities for quality assurance should be included in job descriptions that can be reviewed with new employees and during annual reviews. These responsibilities include observing the quality of ingredients during receiving, monitoring the manufacturing process, and evaluating the color and texture of finished feed. Make sure employees receive training on standard operating procedures in the receiving and grinding of ingredients, batching, pelleting, and packaging of feed. The National Grain and Feed Association (NGFA) and American Feed Industry Association (AFIA) have training material designed specifically for feed milling operations.

Standard Operating Procedures
Standard operating procedures (SOP) outline the steps that must be completed to comply with a QA policy (such as sampling, particle size analysis, and pellet quality determination). Develop SOPs that ensure a safe high-quality feed is manufactured and delivered to the customer. Each SOP should outline the step-by-step instructions that must be followed to complete a routine task. Identify important steps in each process and critical control points that must be monitored throughout the manufacturing process. Employees must understand that not following a SOP could result in a product recall or a product that doesn’t conform to standards. The feed mill should have SOPs for receiving ingredients, manufacturing feed, and delivering finished feed.

Ingredient Specifications
The receipt of quality ingredients begins with the development of ingredient specification sheets that can be included as part of the purchasing process. Each ingredient specification sheet should include the Association of American Feed Control Officials (AAFCO) ingredient definition, typical nutrient values, analytical reference methods, physical properties, basis for rejecting ingredients, and statements that address regulatory compliance. Information for developing specification sheets can be found in the Feed Ingredient Guide II published by AFIA, the annual Official Publication of AAFCO, and supplier technical sheets. Share your mill’s ingredient specification sheets with suppliers, and include the sheets as part of the purchasing agreement. Make sure a process is in place to evaluate nutrient content and physical properties of a new ingredient before its first shipment to the feed mill. As ingredients are evaluated, maintain a list of suppliers that have been approved by the purchasing department and nutritionist to deliver products to the feed mill. The approved supplier list should be reviewed annually by the feed mill manager, purchasing agent, and nutritionist.

Critical Control Points
The manager should create a QA team composed of production supervisors and operators who can identify critical control points within the feed mill. Front line supervisors and operators can provide valuable advice on how a control point will affect the manufacturing process and the quality of the final product. Hazard analysis and critical control point (HACCP) programs often associate critical control points with hazards that have the potential to result in unsafe feed for animals. However, critical control points can be expanded beyond hazards to include monitoring all the processes that affect the total quality of the finished feed. Examples of critical control points within the manufacturing process may include testing ingredients for mycotoxins, scale certification, formula verification prior to batching, and moisture content of finished feeds.

Quality Assurance Manual
The QA manual outlines the policies and procedures that must be in place to ensure a safe high-quality feed product is manufactured and delivered to the customer or animals. One way to develop a manual is to separate it into sections based on the key processes at the feed mill. The Model Feed Quality Assurance manual developed by the NGFA includes the following sections:

- Purchasing and Receiving
- Feed Manufacturing and Process Control
- Finished Feed Sampling, Inspection, and Labeling
- Feed Shipment and Delivery
Feed Manufacturing Process

- Particle reduction — particle size specification, sample frequency, sample location
- Proportioning — scale and meter calibrations, batch reports, weighing tolerances
- Mixing — ingredient addition sequence, mixing sequence, flushing protocol, batch size, mix uniformity test, mixing time (dry and wet time), liquid addition quantities
- Pelleting — conditioning temperature and time, die specifications, pellet quality standards
- Cooling — retention time, bed depth, cooled pellet moisture, temperature
- Post-pelleting liquid application — scale and meter calibration, liquid dispersion
- Critical control points — weighing errors and deviations, conditioning temperatures, cooled pellet temperature and moisture
- Medicated feed additives — receipt, daily usage, reconciliation, inventory variance

Purchasing and Receiving

- Ingredient sampling — location, frequency, sample retention policy
- Ingredient evaluation — nutrient content (moisture, protein, fat, fiber), mycotoxins’ levels, NIR (moisture, protein, fat, starch), cereal grain grades, physical properties
- Laboratory analysis schedules — individual and composite analysis that determine proximate values, minerals, amino acids, gross energy
- Ingredient traceability — supplier and transportation information, lot numbers, storage bin location
- Operational procedures — checklists, shipping document requirements, bin rotation schedule, rejection protocol
- Regulatory compliance — BSE, Bioterrorism Act

Consider factors such as weighing errors and deviations, conditioning temperatures, and cooled pellet temperature and moisture when establishing critical control points in the manufacturing process.

Finished Feed

- Sampling — frequency, nutrient analysis schedule, retention period
- Labeling — regulatory requirements, management protocol
- Physical properties — pellet quality, particle size, texture
Feed Delivery
- Bulk delivery — equipment inspection, loading and unloading protocols, shipping documents, and sequencing, flushing, physical cleanout procedures
- Packaging — scale certification, labeling, inventory rotation, lot identification
- Product traceability — transporter and customer contract information, lot number

Sanitation
- Sanitation — priority area, assigned responsibility, inspection frequency
- Pest and rodent control — prevention methods, inspection, control procedures

Product Investigation and Recalls
- Investigation — customer complaints, manufacturing discrepancies
- Recalls — recall program, procedures, recall team, mock recalls

Reporting Systems
The development of a reporting and monitoring system is an essential element of a comprehensive QA program. A well-designed data collection and analysis system will allow mill managers and operators to determine how a process change may affect the final product quality. Develop a system to check conformity to procedures, monitor critical control points, and evaluate both the nutrient content and physical quality of the finished product. The reporting system should yield both timely and relevant information that can be used by each operator, as well as the manager, to correct or improve the manufacturing processes. Statistical process control charts can be created by hand or generated with third-party software packages, or through the use of statistical process software packages that are incorporated into many modern feed mill automation systems.

SUMMARY
Developing a comprehensive QA program is only the first step in the production of a high-quality safe feed. The production of a quality feed requires the commitment of management, operators, and maintenance personnel. The management team must set the example and demonstrate the importance of manufacturing a quality product that meets the needs of the customers and their animals. A successful QA program is one in which quality is part of a company’s culture rather than a requirement of the job.