FEED manufacturers are often forced by circumstances to focus on short-term concerns such as: How many tons were produced this week? How many customers do I have, or how much down time did I have this week? While important, short-term problems can cause manufacturers to focus on solving problems rather than pursuing the company’s mission.

Manufacturers who regularly examine their company’s mission tend to have a sense of who they are and where they are going. How many feed manufacturers know and regularly examine the organization’s mission?

The immediate response of some manufacturers might be: “Our mission is to make a profit.”

Although making a profit is certainly necessary for company survival, profit as a sole objective is short sighted. What are we trying to accomplish when feeds are formulated and manufactured? Although there can be numerous mission statements, an overall mission of feed formulation and manufacturing might be: “To provide customers with efficiently delivered, safe, high-quality feeds that are correctly delivered to their facilities and consistently contain the available nutrients required by animals for body maintenance, growth and reproduction.”

A comprehensive feed quality assurance (QA) program should manage the materials (ingredients and supplies), equipment, personnel and procedures to efficiently deliver safe feeds that consistently contain the formulated nutrients to optimize the production of meat, milk and eggs. QA is a comprehensive program of controls directed at ensuring the production of feeds that meet a predefined set of standards (Rydell, 2005; Boyd, 1993). QA refers to the policies, procedures and process controls that yield a consistent product, where as quality controls are the in-plant process measurements that insure quality parameters are met during receiving, manufacturing and delivery.

Development of quality assurance programs

A comprehensive QA program will include employee training, ingredient specifications and traceability, QA manual, standard operating procedures, critical control points, sampling and analytical schedules, reporting systems and review processes. A company’s business model should define the goals and objectives that 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 Assn. (AFIA) requires feed mills to develop QA teams, create mission statements and set quality goals as part of the certification process (Stark, 2010). The National Grain & Feed Assn. (NGFA) model “Feed Quality Assurance Program” (NGFA, 2002) contains six components that should be included in a QA manual:

1. Purchasing and receiving;
2. Feed manufacturing and process control;
3. Finished feed sampling, inspection and labeling;
4. Feed shipment and delivery;
5. Sanitation and pest/rodent control, and
6. Feed product investigations.

Since the development of an actual QA program, control policies and procedures must be adapted to the needs of each facility, this article will focus on the basics of a feed QA program and quality control measures rather than specifics in the hope that the discussion will stimulate thinking and innovation in the field of feed-quality assurance and controls.

Ingredient purchasing, receiving

Since many of the major feed ingredients originate as by-products from other industries, feed manufacturers often find themselves managing the variation of these by-products in an attempt to convert low-quality, inconsistent ingredients into a consistent feed that meets the nutrient requirements of animals. Feed mills do not have a magical formula for improving poor-quality ingredients, but through the use of ingredient segregation, grinding equipment, long-term conditioning and pelleting, the nutrient utilization of ingredients can be improved. However tempting it may be to purchase low-cost, inconsistent-quality ingredients, feed mills typically are not designed to manage ingredient variation, and often do not successfully manage the variation. The result of not managing the variation is an inconsistent feed both in terms of nutrient content and physical appearance. In today’s competitive business environment, product variation will lead to a loss of customers and variation in animal performance.

Ingredients can account for 70-90% of the cost of producing feeds (Jones, 1989). Furthermore, as feed mills get larger, the percentage of the total cost accounted for by ingredients will tend to rise. Not only does it make good economic sense to pay attention to ingredient quality, but a large portion of the variation in the nutrient content of finished feeds can be traced to ingredients. In fact, one poultry company was able to associate ingredients with 40-70% of the variation in nutrient content of the finished feeds (Jones, 1989). Nutrient content variations violate the primary objective of feed manufacturing and cost in terms of performance.

What is quality? Quality has been defined by various individuals as “fitness for use” or “meeting an expectation” or “degree of excellence” or “conforming to a standard.” Although near infrared spectrophotometry (NIRS) is used by a number of manufacturers to rapidly determine the moisture, fat, protein and fiber content of an ingredient sample, many feed manufacturers do not analyze ingredients prior to use. Feed mills that do analyze prior to receiving as discussed earlier may not have the ability to segregate and re-formulate based on receipts, especially in large plants that turn their inventory several times a week. Hence, most manufacturers operate on “supplier/plant histories.” Therefore, predictability is important with respect to feed ingredients. Ingredients must be predictable not only in their nutrient content but their physical properties. Said another way, high-quality ingredients meet expectations not just some of the time but most of the time.
It should be obvious from the preceding discussion that the first priority in the production of quality feed is to understand and define ingredient quality in specific terms. This means that ingredients must be described in two ways. First, they must be described in terms of analytical values (moisture, protein, fat, etc.), and second, they must be described in terms of physical and/or sensory characteristics (density, color, odor, etc.). The first description depicts ingredients in terms that analytical chemists understand, while the second describes ingredients so that the feed mill personnel can make decisions about ingredient quality.

AFIA publishes a book titled “Feed Ingredient Guides II” that describes the color, odor, texture and test weight of feed ingredients as well as typical nutrient levels. Receiving personnel should have ingredient reference samples, which include examples of both desirable ingredients and undesirable ingredients.

Ingredient-quality programs that stop with physical or sensory definitions of quality generally do not consistently obtain quality ingredients. More objective means of determining quality must be used as the ultimate judgment of ingredient quality. This objective determination is accomplished by laboratory testing and analysis. While method description is not the objective of this article, it is important to be reasonably certain that laboratory results are reliable. Due to the fact that several methods exist for measuring a nutrient, it is important to specify the analytical method in the ingredient specification sheets, as results may differ based on the method (AFIA, 2007).

In the U.S., two organizations publish manuals that contain methods approved for the analysis of feeds: the Association of Official Analytical Chemists (AOAC) and the American Oil Chemists’ Society (AOCS). Analytical results from laboratories employing methods that have not been approved by AOAC, AOCS or similar organizations can be highly questionable. Both organizations also conduct check sample programs, as well as the Association of American Feed Control Officials (AAFCO). Check sample programs provide participating laboratories with identical feed samples for analysis. Results are then analyzed and used as a basis to provide laboratories with an evaluation of both the accuracy and the precision of their analytical work. Check sample programs are crucial in verifying the accuracy of results. In fact, results from laboratories that are not participating in a check sample program can be challenged in disputed situations.

In a very real sense, the ingredient quality received by a given manufacturer begins with your supplier. Ingredient quality received at a given facility may well be a reflection of what your suppliers believe you want in terms of quality. Consequently, the first task in a good feed quality assurance program is to design an approach to communicate your dedication to quality to ingredient suppliers.

While there can be a myriad of approaches, the following steps outline one approach to communicating your commitment to quality:

1. Commitment to quality begins with you. If you are committed to obtaining quality ingredients, your behavior must reflect that commitment, otherwise your suppliers will see through your lip service and supply the ingredient quality your actions have indicated you want. This means that companies MUST NOT just look for bargains (low price) in feed ingredients, that quality must be foremost.

2. Decide what you want in ingredients and put it in writing. Include the following in your specifications: visual appearance of the product, physical characteristics (e.g., grind or bulk density) of the product, expected analytical assay values, sampling procedures, analytical assay methods, criteria for refusing to accept ingredient shipments and the process for deficiency claims. Discuss these specifications with your suppliers to determine whether or not they can supply your needs. Companies should have an approved supplier list of those companies that meet your quality needs. The approved supplier list and ingredient specifications should be sent to the receiving personnel, the laboratory manager and purchasing agent.

3. Examine all incoming ingredients thoroughly. It is particularly important at this point to be certain that samples of the load are collected correctly. Following sample collection, appropriate on-site quality-control tests (e.g., moisture, test weights, mycotoxins, rancidity, etc.) should be performed. If the load is found deficient, it is important to reject the load. While rejection of deficient loads may seem to be a drastic step, it is a step that will leave no doubt in your supplier’s mind as to your commitment to quality. A company should have a written rejection process that outlines the steps for rejection, which includes documentation of all the pertinent information, a sample of the rejected product and pictures as necessary.

4. Have ingredient samples analyzed by a qualified laboratory. The values obtained from these analyses will provide you with a continuing evaluation of the quality of your supplier’s product. This step is also necessary since laboratory results are necessary to provide the ultimate judgment of ingredient quality.

5. QA groups should develop meaningful reports. Feed mill managers, nutritionists and purchasing agents must have reports that allow them to make timely management decisions to improve ingredient quality. Generating analytical results that are not used in management or purchasing decisions due to a poorly designed report is both a waste of time and resources in a company. Graphs can be used to illustrate quality over a period of time and can include upper and lower control limits. Summary tables, on the other hand, should focus on a few important numbers such as the average, standard deviation and number of samples.

6. Communicate often with your suppliers about quality. Let your suppliers know that you are aware of the quality of their product. This will help your suppliers know that you really care about receiving high-quality ingredients.

7. Adjust your formulas to reflect the assays you are receiving. If you do not adjust your formulas to reflect the actual assays, in effect, you have wasted much of the time and money you spent on the assays.

8. File every deficiency claim possible. Filing these claims will put added “teeth” to your ingredient quality program. Dr. W. Edwards Deming is perhaps the most renowned authority in the world on the subject of quality and productivity. Dr. Deming’s 14 Points of Management were reviewed and illustrated by Benoff (1991). While most of Dr. Deming’s 14 Points of Management apply to company structure and personnel management, the following point (point 4) applies to feed quality assurance programs:

“End the practice of awarding business on price alone. Instead, minimize total cost by working with a single supplier.”

Benoff (1991) points out that, traditionally, purchase contracts have been awarded to the lowest bidder who meets the

<table>
<thead>
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<th>CV</th>
<th>Rating</th>
<th>Corrective action</th>
</tr>
</thead>
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<tr>
<td>&lt; 10%</td>
<td>Good</td>
<td>None</td>
</tr>
<tr>
<td>10-15%</td>
<td>Good</td>
<td>Increase mixing time by 25-30%</td>
</tr>
<tr>
<td>15-20%</td>
<td>Fair</td>
<td>Increase mixing time by 50%, look for worn equipment, overfilling or sequence of ingredient addition.</td>
</tr>
<tr>
<td>&gt; 20%</td>
<td>Poor</td>
<td>Possible combination of all the above. Consult extension personnel or feed equipment manufacturer</td>
</tr>
</tbody>
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Feed Quality **Quality control in feed manufacturing**

specifications. This system is supposed to force competition between suppliers, driving the price down and quality up.

However, purchasing on price alone does not account for all of the cost connected with the use of products, since there is a cost of use associated with each product. In other words, the production system must be adapted to the use of each product. While adaptations cost, this cost is often ignored because it is difficult to measure. In terms of feed ingredient quality, this means that variations in the nutrient content of finished feeds may be associated with the number of suppliers and that each supplier is an additional source of variation. These variations lower quality and raise costs. Thus, obtaining ingredients from a single supplier who cares about quality may make economic sense.

**Process control**

The process by which high-quality ingredients are made into high-quality feeds involves three components within the feed mill: personnel, equipment and procedures. If quality is lacking in any of these three components, the consistent production of high-quality, safe feed is unlikely. However, it is equally important to ensure that personnel, equipment and procedures are “blended” together toward the goal of efficient production of high-quality safe feed.

**Personnel.** Three general characteristics should be sought in new employees: productivity, interest or alertness and the ability to work as a team member.

Once hired, employees should complete a formal training process that outlines their responsibilities in manufacturing a safe, quality feed (Stark, 2009). This training should include not only what job to do, but why the job is necessary. Employees should be informed initially and reminded periodically through the performance review process that their job is to achieve the total quality effort and how their performance compares to that of their job description. Training documentation is also required by government agencies and is a component of third-party certification programs. Once trained, the company saves money if employees are encouraged to stay with the company. This means employees must be motivated, either by the work or by the manager to remain on the job.

Company commitment to quality must be supported by everyone from top management down. Employees who do not follow the company policy on quality will tend to undermine the program. Managers who accept ingredients that do not meet company specifications send a message to their employees that quality standards are not important.

**Equipment.** Equipment selection, operation, repair and troubleshooting can become a very complicated matter, which can not be covered adequately in a short space. However, applying the following general points to each specific piece of equipment will help reduce equipment problems:

- **Application:** Was the equipment designed to do the job it is doing?
  - **Installation:** Was the equipment installed according to the manufacturer’s recommendations?
  - **Adjustment:** Are the critical adjustment points within the machine set correctly?
  - **Operation:** Is the machine being operated according to the manufacturer’s recommendations?
  - **Capacity:** Is the equipment being run within the rated capacity?
  - **Lubrication:** Is the correct amount and type of lubricant used within the time frame suggested by the manufacturer?
  - **Maintenance:** Does your company have a written preventive maintenance program? Can you predict when maintenance and possible repairs will be needed on each piece of equipment? Do you have spare parts and tools to perform maintenance and repairs?

**Procedures.** Procedural difficulties are common problems in feed mill operations. Feed mills either don’t have written standard operating procedures (SOPs), haven’t trained their employees to the SOPs or don’t follow them as written. SOPs should be developed for each critical operation in the feed manufacturing process. They should be included in new employee training and the operator certification process. Every procedure instituted should incorporate the following:

- **Communication:** Does the person doing the procedure understand what is expected? If another person had to take over their job would he/she understand?
  - **Identification:** Are controls on equipment clearly identified? Are bagged ingredients clearly labeled and stored in an orderly manner?
  - **Traceability:** Will this procedure allow you to trace problems to their source?
  - **Verification:** Are samples being taken and stored that will allow you to verify the source of the problem?
  - **Records:** Are all records being kept of use? If records are of no use or potential use discontinue collection. Useful records should be stored in a clean, safe and accessible place.
  - **Safety:** Does the SOP outline the safety procedures (lock-out/tag-out, permits, etc.) and the appropriate personnel protective equipment (PPE) required to properly complete the operation?

**Finished feed**

In many situations, feeds are used rapidly after they are manufactured and animals consume the feeds before any assays can be performed. However, finished-feed assays are necessary and important because they provide the mill with a “final report card” on how well quality was controlled.

How much finished-feed sampling and analysis should be done? While the answer to that question will depend on numerous factors, a general rule of thumb is to collect two samples of each formula per week or one per batch run. Intake can be monitored. However, finished-feed assays are necessary and important because they provide the mill with a “final report card” on how well quality was controlled.

**Feed shipment, delivery**

Feed shipment and delivery is the last step in the manufacturing process. Written programs should outline the steps the delivery driver must take prior to loading the truck, during the loading processes and, finally, how the feed is delivered to the farm. The procedures should outline sequencing and flushing steps at the farm or upon arrival at the feed mill. In addition to the delivery process, there must be adequate documentation to trace the product from the feed mill to the delivery location.

This information is required in the event of a product recall. The information is also required for companies that must adhere to the rules established in the Food & Drug Administration’s bioterrorism act of 2002. Finally, delivery trucks and trailers should be inspected as part of the Preventive Maintenance Program. Inspection should look for material build-up in transfer points, broken gates, cracks in the compartments and worn transfer equipment (screw and drag conveyors).

**Sanitation, pest/rodent control**

Sanitation and housekeeping programs help maintain a safe
Feed Quality

and clean working environment for the mill employees and make a good first impression on customers and inspectors. A well designed and executed housekeeping program also helps control pests (insects, mice, rats and birds) by eliminating their food and water sources and nesting areas. Clean feed mills are a result of the commitment of the management, operators and maintenance group. The manager must set the housekeeping standards and expectations and then lead by example, operators must maintain a clean work area and report problems to management and maintenance employees must seal all conveyors and ensure the dust control equipment is functioning properly.

Feed product investigations/recalls

A written confined space program, which identifies both the employee safety is even more vital. The feed mill must have ingredient storage bins should be inspected at least once each growth and cross contamination. Thus, finished feed and in-
erable daily by the same person. Registered feed mills must complete a drug inventory each day by law. Theoretical and reconciling, Andrews (1991b) pointed out that the following actual use of ingredients should be reconciled. In this rec-

Feed mill quality, process control

Once quality personnel, equipment and procedures have been established with a QA program, control can best be maintained by applying effort at the “critical quality control points” in the mill. These “critical quality control points” are:

(1) Ingredient inventories. Ingredient inventories can be frustrating to mill personnel. However, since inventory pro-

(2) Bin cleaning. If bins are not periodically cleaned, ingred-

(3) Inspection of equipment cleanliness and condition.

While maintenance procedures should ensure that equip-

(4) Grinding. If the hammermill and/or other grinding
equipment do not operate correctly, then mixing, pellet-
ing and animal performance may suffer. Thus, hammer and screen condition and wear should be checked weekly. Magnets should be cleaned and checked for correct opera-
tion daily or at the shift change. Grind consistency should be checked visually each shift to ensure that there are no holes in the screens. The particle size of the ground material should be checked weekly using the standard particle analy-
sis method (ANSI/ASAE S319.3 PEB03) and compared to the company target. The particle size of grain used in pelleted feeds should be less than 600 microns. The grain in mash feeds should be in the range of 700–900 microns to reduce flowability problems in feed storage tanks.

Hammermills are typically selected in operations that pro-
duce pellets due to their ability to produce a consistent fine-
grained product, easy operation and minimal maintenance requirement. Roller mills are often selected in feed mills that primarily produce mash feed. Roller mills will produce a granular product that has better flow characteristics than hammermill-ground material.

Special attention should also be paid to the removal of heat from ground grains exiting the hammermill, especially if the mill is targeting a grind of less than 400 microns. If ground

Special attention should also be paid to the removal of heat from ground grains exiting the hammermill, especially if the mill is targeting a grind of less than 400 microns. If ground

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(5) Batch system validation. Batch system validation should be done on a monthly basis. Begin the validation pro-
cess by verifying that a clean finished-feed bin is available. Next, batch and mix a mash formula in the usual manner and record the batch weight. Convey the batch to the clean finished-feed bin, load it out into a bulk truck and record the truck weight. Batch weights and truck weights should be within 1% of each other. If weight differences are more than 1%, begin by checking the following in the batching system:

• Batch and micro-scale accuracy;
• Conveyor integrity (Is there a leak?)?
• Bin integrity (Is there a hole in the bin wall?)
• Turnhead position and maintenance (Does some feed get diverted to another bin?)
• Mixer and batch scale slide gate operation (Does one batch leak into another?)

(6) Mixing. Mixing is one of the most critical steps within any feed manufacturing operation. Yet, Wicker and Poole (1991) found that more than half of the 145 mixers tested were not providing an adequate mix. The authors attributed mixing inefficiency to:

• Insufficient mix time;
• Operation of mixers beyond designed capacity, and
• Worn, altered or broken mixing equipment.

While equipment manufacturers have made great strides in providing their customers with durable mixers that rapidly and efficiently mix feeds, it is obvious from these data that many times mixers and the mixing operation are taken for granted or ignored. Batch mixers should be examined routinely as part of the preventive maintenance plan. Inspect the mixer shafts, ribbon paddles or screws for build up — excess build up is typically associated with incorrect liquid application and/or nozzle placement in the mixer. Mixing times...
Feed Quality  Quality control in feed manufacturing

should be checked at least twice each year. Sometimes premix manufacturers will check mixer times as a service to their customers. However, no matter who checks the mixer’s uniformity, mixing time should be correctly evaluated. Procedures for checking mixing time are outlined in Feed Manufacturing Technology V (which can be purchased through AFIA) and the Feed Additive Compendium (Jones, 2010). While a coefficient of variation (CV) of 10% or less is generally accepted as a homogenous mix, the guidelines shown in the Table can be used when evaluating CV results. Wicker and Poole (1991) pointed out that CVs of 4-7% are attainable in production situations when synthetic amino acids are used as a marker in the feed.

(7) Pellet cooling and pelleting. Pellet and pellet cooling is a complex process that has a number of input variables that must be routinely monitored and adjusted. Particle size, mash moisture, steam quality and air temperature and humidity will affect the quality of the finished feed. While automation systems have made the process simpler and more accurate, the following indicators of quality should be examined on a regular basis:

- Conditioning temperature. Conditioning is probably the most important part of the pelleting process (Andrews, 1991a). When feeds are adequately steam conditioned, pellet durability is improved. In addition, the amount of the activation of mold inhibitors (Tabib et al., 1984) and reduce the incidence of pathogens such as salmonella (Blankenship et al., 1984).

Conditioning temperature should be as hot as possible (preferably greater than 180°F in the winter and 190°F in the summer). Steam provides both heat and moisture to soften the ingredient particles and activate the natural binding characteristics of the proteins and starches within the ingredients. The moisture content of feed should be 17-18% after conditioning. However, attention should also be paid to heat-sensitive feed additives such as enzymes and vitamin levels. Fat-soluble vitamin activity can be destroyed by the pelleting process (Jones, 1986).

- Cool-pellet temperature. The temperature of adequately cooled pellets (or crumbles) should be within 5°F of ambient temperature. Cooling problems are generally associated with bed depths that are too high or low, incorrect air balance (volume and velocity) and uneven bed depth. When pellets are inadequately cooled, moisture migration, mold growth and bin corrosion problems are likely to occur. Cool-pellet temperature should be checked once each shift.

- Moisture gain. Moisture gain from pelleting is checked by comparing the moisture of the mash prior to pelleting with the moisture of the cooled pellets. Moisture gain can accelerate mold spoilage problems. While no moisture gain is a worthy goal, a more attainable goal is less than 0.5%. Removing the moisture in the feed is more difficult during the colder months of the year when the air has a lower moisture-holding capacity. Moisture gain should be checked weekly.

- Crumble texture. The texture of crumble feeds should be closely controlled, since incorrect crumble size can lead to palatability problems and inefficient animal production. Yet there are difficulties sometimes in determining the correct crumble size. While rules of thumb are dangerous, field experience suggests that about 50% of correctly sized crumbled feeds will be retained on a U.S. No. 12 sieve.

- Pellet durability. Many of the benefits of pelleting on animal growth and feed conversion are due to the physical form of the feed. Thus, durable pellet have a positive effect on animal performance (McKinney and Teeter, 2004; Stark, 1994). The two primary methods for testing durability are the Kenney University tumbling box and Holmborg tester. Both methods can be used to model pellet handling in the feed manufacturing and delivery process. The Kansas State procedure is an ASAE standard method (ASAE.S269.4), which is described in Feed Manufacturing TechnologyV (may be purchased through AFIA).

However, it is important to understand that the pellet durability procedure has a certain amount of inherent variation that must be taken into account when interpreting results. Pellet durability tests are a useful tool to predict the amount of fines that will be delivered to the customer and, ultimately, to the animal. At least four samples of a given feed should be tested throughout the pelleting run in order to determine the average durability. Durability should be checked at least once each week, preferably daily.

(8) Meters and scales. If the mixing process is under control, whether or not the formula is made according to the nutritionist’s recommendation may well depend on the accuracy and adjustment of the scales and meters. Thus, each facility should own and use test weights to check the calibration of scales weekly. Batch scales should be cleaned and inspected at least once each month, while micro-ingredient scales should be cleaned and checked weekly. All scales should be professionally serviced at least twice each year, preferably quarterly. Liquid metering devices should be checked and adjusted at least quarterly. Post-pellet liquid application equipment and metering devices should also be checked periodically during long formula runs.

(9) Truck inspection and cleaning. Trucks are sometimes overlooked as a source of moisture, mold and drug contamination. Companies should have flushing and sequencing procedures in place to prevent cross-contamination of medicated feeds. Truck drivers should be held responsible for the soundness and cleanliness of their trucks (both inside and outside). However, it is important that mill personnel also ensure that trucks are clean and in good repair prior to loading.

When a problem is discovered, it should be addressed and resolved as soon as possible. The steps outlined below are one method of addressing finished-feed problems:

1. Is the assay correct? Ask the lab to recheck the assay and continue to examine the problem.
2. How was the sample taken? Was the sample representative? You may want to re-sample it if the material is still available.
3. Is only one nutrient level out of control or are several? This could be a clue as to whether a certain ingredient was left out of the formula.
4. Does the regular crew operating the mill when the feed was produced?
5. Check inventory records for any discrepancies between the actual and predicted inventory records.
6. Check the scales and metering devices for correct adjustment.
7. Check ingredient and finished-feed bins at the feed mill for hang-ups or bridging problems.
8. Recheck the mixing time to be certain it is correct for the ration involved.
9. Check the ingredient assay values to see if they indicate a deficient load was received. If a deficient load was received, contact your ingredient supplier immediately.
10. Check the formula matrix to be certain that ingredient assay values are correct and reflect the values presently being received.

After going through these 10 steps, it is possible that you may still not know what caused the problem. While this is frustrating, your efforts have not been in vain. Laboratory personnel, the mill personnel, the office staff, the nutritionist and several other persons have all become aware of your company’s dedication to the production of high-quality feeds.

If problems are consistently addressed as they occur, the mental image of dedication to produce a safe, quality feed will become fixed in the minds of the people involved and this image can only work for your good.
Feed Quality

Quality control in feed manufacturing


