Introduction

Feed costs represent over 75% of the cost of raising pigs, and producers have many feed purchasing and production options to consider. Swine producers may: 1) choose to buy feed from independent feed mills, mills of national firms, or cooperatives; 2) buy premixes, base mixes, and/or supplements from various companies who also provide nutritional and technical expertise on the proper mixing and feeding of these products; 3) purchase individual raw materials and mix them to their own specifications; or 4) use a combination of these purchasing methods. However, many other services have been traditionally provided by feed companies, and their value must be taken into consideration as well when determining where to purchase feed. Ultimately, the final decision on these alternatives is in the producers’ hands, and it can have a tremendous impact on their profitability.

Objectives

The main objectives of this fact sheet are to help producers:

- Select suppliers;
- Determine which ingredients are acceptable;
- Chose the physical form of the diet;
- Outline a quality control program;
- Negotiate price including weighing freight and delivery options.

The reference for this factsheet is the NPPC FEED PURCHASING MANUAL [1] developed by Kansas State University and published by the National Pork Producers Council.

Factors to Consider When Choosing Suppliers

An important decision for producers in the feed purchasing process is identification of a supplier or suppliers that can meet their expectations for products and service. Several factors should be considered in selecting potential suppliers.

**Dependability/Reputation.** Many suppliers have been in business for many years and have developed an excellent reputation. Past history and track record with other producers is an excellent means of gauging a supplier’s depth of commitment to swine production and the satisfaction of their producers.

**Expected Pig Performance.** Expected performance in terms of cost per pound of pork produced and rate of gain also should be key factors in selecting a potential supplier. Many times, the lowest priced feed per ton is not the most cost efficient.

**Security/Feed Quality Control Programs.** Monitoring the physical and nutrient standards of feeds (purchased or mixed on-farm) and feed ingredients (purchased or home grown) is fundamental to the drive for
consistent pig performance and enterprise profitability. Producers should select feed manufacturers and/or ingredient suppliers who have implemented effective quality control programs. A suppliers’ commitment to quality control is an indicator of their commitment to protecting your investment as a swine producer.

**Service and Support.** The producer should carefully assess the services and technical support offered by the supplier. The producer also should consider the value of the services provided by each supplier to their own operation and their personal needs for those services.

**Price.** Bottom-line cost effectiveness has become an even more crucial issue in a global economy. Producers must consider prices for products when selecting a supplier. However, price per unit does not indicate bottom-line value in all instances. Along with price, the following factors also should be considered.

**Prompt Delivery.** Delivery of products in a timely fashion is critical to business success. Producers should assess their delivery requirements and communicate them to potential suppliers to ensure the supplier can meet their needs. Also, the feed deliveries need to be made in accordance with the farm’s biosecurity plan.

**Personal Relationships.** A trusting relationship for a win-win attitude towards pork production business between the producer and supplier is essential. Pork producers enjoy working with suppliers that they trust.

**Knowledge – both product & industry.** Suppliers can be excellent information sources for the producer. Suppliers may offer newsletters, electronic communications, production manuals, customer meetings, or record-keeping services for producers.

**Research, Development, and Innovation.** Each supplier has different levels of involvement in a research and development program. Some suppliers have a major commitment to research and product development, while other suppliers rely on other sources for their product development information. The degree of involvement in a research and development program by a feed supplier may influence the quality and cost of their feed products.

**Financing.** Producers often use suppliers as a source for a line of credit. Many suppliers will provide reduced cost financing or share in the financial risk of running a swine business.

**Local Support.** Individual producers also must gauge their desire to support companies with a local base in the community. For some producers, local feed mills indicate a long-term, strategic commitment to the community by the supplier. Their importance to the local tax base and employment also are considered important by some.

**Services.** Swine producers must purchase or provide their own technical services in many areas. Some feed suppliers offer a variety of services whose costs may be bundled with the feed products purchased by the producer. The cost, quality, and need for each of these services should be considered when selecting a supplier.

In some instances, these services can be purchased separately from the feed; however, the services are usually only available for customers purchasing feed products. If producers enter a bidding process, they should understand what services are included with the purchase and what services they may obtain separately from the supplier.
Acceptable Ingredients

Individual feedstuffs are not essential in a swine diet. However, ingredients are sources of essential nutrients. The goal of the producer and feed manufacturer is to choose the mixture of ingredients that will meet the nutrient requirements of the animal for optimal performance at the lowest cost. The most cost-effective mixture of ingredients needed to meet the nutrient requirements will vary with ingredient markets, region of the country, purchasing power of the supplier, and many other factors.

Most producers should seek assistance from an outside source to help make decisions on ingredients that will be acceptable in a final feed product. Careful thought must be given to the list of acceptable ingredients and allowable limits. Remember, the goal is to produce quality pork at a competitive price. Extreme limitations on ingredients will increase diet costs. However, lack of limitations may result in a product that does not meet your performance expectations. Also, the ingredient must be available in an amount large enough to make its use worth the additional work of switching ingredients.

**Ingredient Sources.** If a producer desires a particular source of an ingredient, the source should be specified. An example might be to specify certain suppliers as the source for specialty ingredients, such as animal plasma, blood meal, fish meal, or dried whey. Specifying the ingredient source is usually done when an ingredient is highly variable in quality and the essential quality attributes are difficult to measure. The producer can and should modify this list of acceptable ingredient sources when sufficiently warranted by supporting research from suppliers or other sources. Limiting sources generally has some impact on ingredient cost.

**Minimums and Maximums** In consultation with appropriate nutritional advisors, producers should form their own list of ingredients with allowable maximum levels. Individual state nutrition guides [2,3,4,5] and the PIG Factsheet 07-07-09 (Composition and Usage Rate of Feed Ingredients for Swine) will offer suggestions on the maximum levels of individual energy and protein sources. Minimum levels also should be included for ingredients desired in a diet.

**Total Nutrients versus Available Nutrients.** Formulating diets using actual availability of nutrients in each ingredient would be more accurate than using total nutrient levels. However, nutrient availability values are not published for all nutrients or all ingredients. Additionally, some published values for nutrient availability are derived from single studies with relatively little data. Total nutrient levels can be used with
relatively high accuracy when diets are based on only a few ingredients (e.g. corn-soybean meal diets). When diet composition changes often and variable byproduct ingredients are used in feed, it is best to use available nutrient levels.

**Vitamin and Mineral Premixes.** Vitamin and trace mineral premixes are normally added to swine diets at inclusion rates of 1 to 10 lb/ton. When writing toll-milling specifications for a vitamin premix rather than purchasing a supplier-developed premix, it is essential to include all desired vitamins, their level of inclusion, and the desired source/form of each vitamin and trace mineral. Improperly written specifications can lead to undesirable products. Common nutrients and nutrient sources included in vitamin and mineral premixes are listed in PIG Factsheet 07-02-06 (Trace Minerals and Vitamins for Swine Diets). Premix inclusion rates should always conform to mixer capabilities. As carriers in vitamin and mineral premixes are reduced, the premix becomes more concentrated. With the smaller inclusion levels of vitamins and minerals, it is essential that even more attention be paid to the weighing and mixing these ingredients to ensure proper animal performance at the end.

**Physical Form**

When buying feed, it is essential that the grains be ground to the correct particle size for optimum feed efficiency. The ideal particle size for pigs is between 600 and 700 microns for meal diets. Standard deviation of particle size of feed is important as well as it helps dictate the flow ability of the diet with grain, with lower standard deviations providing better flow ability.

Pelleting can improve feed efficiency but also results in higher feed costs. Producers need to make sure the increased cost of pelleting is more than offset by an improvement in feed efficiency. Starter diets are typically pelleted to prevent ingredient segregation and increase feed intake. However, pellet quality needs to be measured to assure that producers are getting a good quality pellet. More information on testing pellet quality can be found in the NPPC FEED PURCHASING MANUAL [1].

**Quality Control Program**

Preparation of swine feeds is a complex process involving several important steps that must be followed to enhance the probability for optimum pig growth performance and producer profitability. The feed manufacturing process requires a system of checks and balances to ensure that the final product is consistent with the original product description. To ensure this consistency, a thorough quality control program needs to be developed and implemented based on the specific requirements of the producer. The quality control program should be mutually agreed upon with the feed manufacturer, especially in toll-milling situations. Producers should be aware that a thorough quality control program will cost conservatively between $0.25 and $3.00 per ton of finished complete feed. However, the quality control program is an essential investment that may result in a lower total cost of production due to improved feed quality. Producers need to recognize that as the inclusion level of the purchased product decreases, their responsibility for quality control and assurance increases relative to the complete feed.

**Good Manufacturing Practices (GMP)**
The FDA has established guidelines and standards for Good Manufacturing Practices (GMP) for the manufacturing of animal feeds that must be followed by all feed manufacturing facilities. GMPs form the backbone of a quality control program. Good Manufacturing Practices are designed to prevent feed contamination and to provide reasonable assurance that medicated feed additives are used properly. The function of GMP is to ensure a safe and residue free supply of food for human consumption. All parties involved with the manufacturing of medicated or non-medicated feed, whether at a commercial mill or on-farm must comply with the GMP.

**Sampling**
The success of any quality control program depends upon accurate and representative sampling. Inaccurate and unrepresentative sampling yields meaningless laboratory results and compromises feed producer’s credibility with suppliers. It is important to consider when the sample is taken, who is responsible for taking the sample, and how duplicate samples will be retained on-site. Visual inspection of a sample gives a crude estimate of a product’s physical quality and may allow rejection of the product before it is
unloaded. The cost of rejecting a shipment and impact of waiting for a replacement shipment must be considered. Communication between customer and supplier is needed to ensure mutual agreement of sampling procedure and responsibility. The principles of accurate sampling include frequency, location and size. More information on sampling is included in the PIG Factsheet #07-04-02 (Swine Feed and Ingredient Sampling and Analysis).

Ingredient Quality Guidelines

Visual Inspection of Purchased Ingredients and Diets. Because it is often difficult or impossible to reject unloaded ingredients, an initial visual inspection of feed ingredients is recommended. The person responsible for receiving, inspecting and logging in ingredients should know what to look for when inspecting incoming ingredients. Individual mills and large operations may have written “tolerances” for incoming ingredients. However, some judgment is required of the person who accepts incoming shipments. In addition to training, a library of ingredient samples that meet inspection standards is helpful in visual inspection. The following is a list of some of the more common reasons for rejection.

Bulk Ingredients or Complete Feeds. Bulk ingredients include supplements, base mixes, premixes, or individual ingredients. Desirable qualities include:
- Color typical of product; uniform throughout the load
- Clean, characteristic smell
- Free-flowing, non-sticking, no wet spots
- No evidence of heating - off color, warm to the hand, dark germs in grains
- Reasonable particle size distribution for the product
- Consistent texture and overall appearance
- No dirt, mold, sticks, metal objects, sand, gravel or other foreign material
- No evidence of rodent or bird contamination, or insect damage.

Undesirable qualities that may be cause for rejection include:
- Discolored or off-color material
- Clumps, moldy spots or “set-ups”
- Musty, moldy or “off” odors
- Wet spots or hot spots
- Excessive fines or coarse material
- Excessive foreign material
- Evidence of rodent or bird contamination, or insect damage.

Bagged Ingredients or Complete Feed. Bagged ingredients may include supplements, base mixes, premixes and some specialty ingredients. Desirable qualities include:
- Clean, characteristic smell
- Content and composition agree with label
- No evidence of heating
- No evidence of torn or broken bags
- Dry; no evidence of having gotten wet
- Product in bag has not “set-up” or hardened
- No evidence of bird or rodent contamination, or insect damage.

Undesirable qualities include:
- Discolored or water-damaged bags
- Hard, set up bags
- Moldy, musty or “off” odors

Grains. Grain is subject to a great deal of variation. Moisture content, protein, and test weight will be most critical as indicators for determining grain quality. In addition, foreign materials and presence of molds or
other contaminants that can occur because of improper storage should be noted. A moisture tester and a blacklight (for aflatoxins) or QuickTest can be practical means for on-farm or commercial mill testing of grain quality. If the initial screen indicates mycotoxin contamination, further analysis should be conducted to determine concentration of specific mycotoxins. Home-raised grains should be sampled and tested as new bins or “fields” are used to manufacture feeds. It is sufficient to test for protein and moisture content. Due to the high cost of analysis ($70 to $150/sample) and relatively low amino acid content, lysine and other amino acids should not be regularly tested in grain unless the grain is a specialized variety being used specifically for a high amino acid content. With purchased grain, each shipment should be tested until quality is assured. Test weight, moisture, broken and damaged kernels, and foreign material should also be determined on purchased grain as they are useful in determining if the grain meets trading rule specifications as governed by the National Grain and Feed Dealers Association. Care must be taken to ensure that quality standards and expected nutrient levels are met. If growing or storage conditions promote a cause for suspicion, grain should be analyzed for mycotoxins each time the source (bin or supplier) changes.

**Soybean meal.** Soybean meal is the most common protein source for swine diets. Standards are established for protein, fiber, moisture, and calcium by the National Oilseed Processors Association. The purchaser is entitled to price adjustments should these criteria not meet set standards. However, this price adjustment does not happen automatically. The producer must have the soybean meal analyzed and request a price adjustment. When purchasing a new load, request an official sample and ask the company for a written description of the content. Then send the sample to a refereed analytical laboratory approved by the National Oilseed Processors Association for analysis. If analysis indicates the sample is outside the guaranteed level of the processor, a claim should be filed for a price adjustment. The claim must be filed within 30 days of shipment of the soybean meal from the processor. You may decide to take a duplicate sample for analysis when it is unloaded; however, only the reference sample will be recognized by the processor for price adjustments. Every load should be tested for protein and dry matter content. In addition, calcium should be tested periodically and whenever changing suppliers.

Other protein sources also are variable in nutrient content and should be analyzed for protein content as an indicator of amino acid content. Distillers Dried Grains with Solubles (DDGS) is one such ingredient that is currently seeing a greater increase of usage. DDGS is a co-product of the ethanol industry, and research has demonstrated a wide range of nutrient content and availabilities between and within ethanol plants. To decrease the variation in DDGS, producers are encouraged to identify a few plants that produce a consistent, high quality product and stay with them. They should be able to provide historic nutrient values of their DDGS to get an indication of the product. Some producers will develop a specification sheet to prevent the purchase of lower quality DDGS. An example of this would be:

- Moisture maximum of 12%
- Crude protein minimum of 26.5%
- Crude fat minimum of 10%
- Crude fiber maximum of 7.5%
- Calculated Lysine:Protein ratio of >2.80%
- Color golden (but darker DDGS may not be bad)
- Smell fresh, fermented, pleasant cereal odor
- Bulk density 34-37 lb/cubic foot
- Particle size coarse = 10% max on 2000 mesh screen
  fine = 15% max on 600 mesh screen & pan
- Toxins Either free of or containing very low concentrations (ppb)

Complete diets, supplements, base mixes, vitamin/mineral trace mixes, and all other major ingredients need to be monitored for quality, and more information can be found in the NPPC FEED PURCHASING MANUAL [1].
Considerations When Setting or Negotiating Prices

After ensuring the product/feed is of high quality, other factors need to be considered when establishing the final price. These factors include volume discounts, payment policy, pricing basis, and delivery.

**Volume discounts.** Volume discounts have become very popular because they can help sellers lower their costs and plan production. Many purchasing groups have been organized to take advantage of volume discounts offered by sellers. The following are some questions buyers might ask sellers with regard to volume discounts.

- Do you offer volume discounts?
- Is volume based on tonnage, total value, or combination?
- Is volume based on single, cumulative purchases, or both?
- Does it matter if purchase is for an individual or a group?
- If group purchased, is delivery to centralized location or individual operations?

Volume discounts are available because they help feed suppliers lower manufacturing, marketing, and delivery costs. Diet requests, such as multiple physical form options, multiple drug options, and multiple custom mixes, cause short manufacturing runs and dramatically increase manufacturing costs. Good relationships and communication between the customer and supplier can help reduce many of these costs through increased awareness of their impact on manufacturing cost.

**Payment policy** - some businesses offer discounts if payments are made within a certain time frame. Others may not have a discount policy, but they might have a longer grace period before interest or finance charges are added. An attractive price might not be as good as it initially appears if high interest charges or short repayment periods are added to it; thus, it is important for buyers to inquire about the payment and credit policy before making any purchases.

**Pricing basis** - while it is unrealistic to assume a seller will explain specifically how they set price, buyers should ask about pricing from a risk management standpoint. The following are some questions buyers might ask sellers with regard to pricing so they can make informed risk management decisions.

- Do you offer a formula price contract, and if so, how are prices determined?
- Do you offer a forward price contract?
- Can I lock-in price of some ingredients without pricing all ingredients?
- How far into the future can I lock-in prices?
- Is there a minimum volume for locking-in price?
- Is a deposit required to lock-in a price?
- Can I purchase feed ingredients myself and have them shipped to you for processing?
- Are you willing to bid on my specifications?
- What is the processing fee structure for ingredients I deliver to your mill?

**Freight Responsibility and Terms of Delivery**

Buyers should not overlook the importance of the delivery of purchased feeds. Delivery can significantly affect both the cost of feed as well as actual production (gain, feed efficiency, etc.). Because the delivery of feed is so important, buyers should discuss and/or negotiate the terms of delivery with their feed supplier prior to purchasing feed.

Buyers need to know the sellers freight delivery charges prior to purchasing feed. When the price of purchased feed is quoted FOB, a buyer is directly responsible for the cost of freight to the specified delivery point. FOB pricing means goods are placed free on board a carrier, at which point the title and responsibility pass to the buyer, who pays the freight from the plant to the destination. The supplier might make the delivery in their trucks or an independent trucker may be used, but either way there is a specific delivery charge added to the purchase price. With FOB pricing, the freight delivery charge is a direct cost and is known with a high degree of certainty. Factors that will affect delivery charges will be the distance from the mill, load size, number of stops, number of bins per stop, biosecurity requirements, and lead time required. Flexibility for timing of delivery and batch sizes affect the cost of delivery. In general, the cost of delivery will increase when producers have rigid delivery times. Producers unable to order batch sizes...
matched to the delivery capability of their supplier also will increase the cost of delivery. Therefore, it is important for buyers to be somewhat flexible with respect to delivery so the benefits of good pricing decisions aren’t offset by high delivery costs.

In addition to the cost of delivery, buyers need to know what the supplier can and will do from a delivery standpoint. The following are some questions buyers might ask suppliers with regard to their delivery policy and capabilities.

- What is lead time required before delivery can be made?
- Do you have a minimum load size?
- Is there a maximum number of bins per stop or per site for each load?
- Can multiple batches of each diets be delivered at one time?
- What is your policy or procedure for maintaining biosecurity?
- Are there times or days when delivery cannot be made?
- Do your delivery capabilities change seasonally?
- What can I do to help you reduce your delivery costs?
- What are normal delivery days and holidays observed?
- What are normal delivery hours?

As mentioned previously, suppliers also have an interest in negotiating terms of delivery with potential buyers. Suppliers will not want to commit to a feed and(or) delivery price if they do not know what they are getting into. The following are some questions suppliers might want to ask potential buyers with regard to making deliveries.

- Are the roads to the delivery site(s) capable of handling all sizes of delivery trucks in varying weather conditions?
- Is your feedmill capable of receiving bulk, totes, and pallets?
- What is your expected volume and frequency of purchases?
- What lead time will you give us before expecting delivery?
- Do the conditions of your facilities represent any safety hazards?
- What biosecurity or other special requirements are there for deliveries?
- Do you have multiple sites where delivery will be made?
- Will there be somebody present when deliveries are made, and if not, what will be done for proof of delivery?
- Can bin sizes and deliveries be matched to the capacity of compartments in our trucks to maximize feed hauled with each trip?
- What is the unloading capacity of your system?
- Are your overhead lines high enough not to present a danger when driving under and unloading?

Delivery of purchased feed is important from both a cost and production standpoint. Buyers need to inquire about the freight delivery charges so they can evaluate the total cost of ingredients or feed purchased. Buyers also need to find out what the delivery capabilities of suppliers are to make sure feed can be delivered where and when it is needed. Similarly, suppliers need to ask buyers questions with regards to conditions of roads and facilities to assure they will be able to make deliveries in a timely and safe manner.

**Biosecurity Concerns for Feed and Ingredient Delivery**

As with feed ingredients, there has been little documented association between feed delivery and pathogen transmission. The logistics of feed and ingredient delivery make changing of driver clothing, frequent disinfection of vehicles, or observing down time away from other swine difficult to implement on a practical basis. Therefore, consider all feed delivery personnel and vehicles as having potential for carrying pathogens but with a relatively low risk of transmitting them. Recommended guidelines for feed delivery biosecurity are:

- Feed bins and ingredient storage areas should be located so delivery vehicles and personnel never have contact with pigs or swine facilities.
• Delivery personnel should be instructed never to enter the swine facilities
• Delivery vehicles should be dedicated solely for the hauling of feed or feed ingredients
• Delivery personnel should be instructed to avoid contact with live animals, carcasses, and(or) manure
• Trucks should not be driven in areas where they will be in contact with swine manure
• Trucks should be kept clean and be disinfected if in contact with swine manure or carcasses
• Make feed deliveries to higher-health status locations on Mondays or first thing in the morning

Summary

While feed represents the largest, single cost involved with pork production, buying the cheapest feed on a cost/ton basis is not the way to optimize performance and profitability. There are many different sources/options available when developing a feed program, and multiple factors need to be considered when putting together the best program for an individual operation. The key is identifying the right supplier(s) who will provide a consistent, high quality product, either feed or individual ingredients, at a reasonable price, and all parties are in agreement on all other services provided. It needs to be a “win-win” situation for both the producer and supplier for it to be sustainable for all parties long-term.

References


Frequently Asked Questions

How do I choose the right feed supplier?

You need to assess what your goals are and what you want the supplier to provide. Feed suppliers provide many other services besides feed, and those costs need to be factored in. Also, the supplier’s reputation in the industry and commitment to your success are critical.

Will the least expensive feed make me the most money?

Typically not. While diet cost/ton may be less, it is usually more than offset by poorer gains and feed efficiency, resulting in lower overall profitability. Producers need to shoot for optimum performance at the lowest cost.

Who is responsible for quality control of my feed and ingredients?

It all depends on the agreement between you and the supplier. Unless it is specified in the contract, you are the person responsible for quality control. Also realize there are additional time and costs associated with managing a sound quality control program.

What are the best ingredients to use in swine diets?

There are no “right or best” ingredients to use in swine diets. They all have their benefits and limitations. The goal of a feeding program is to blend a number of different ingredients together to provide a final diet that meets all the animal’s nutrient requirements at the lowest cost.