Feed Mill Key Performance Indicators

Introduction
The business model of a feed company should define those goals and objectives that must be met to either maximize sales or optimize the production of meat, milk, or eggs. Operating a modern feed mill requires good decision-making on the part of the mill manager. The feed mill manager must understand how to use the key indicators that will increase profitability and productivity, as well as reduce costs. Each manager must select from the multitude of indicators that influence the operation’s productivity and costs. These indicators will vary based upon the primary business objective of the feed mill.

Commercial feed mills typically focus on profit margins, sales, and customer service, whereas an integrated feed operation focuses on high volume production of feed at the lowest possible manufacturing cost. Regardless of the business model under which a feed mill operates, there are Key Performance Indicators (KPIs) that apply. Managers should develop KPIs for manufacturing and delivery processes, labor efficiency, manufacturing and delivery costs, safety, and quality. These KPIs, along with an annual manufacturing budget, will help a manager recognize the strengths and weaknesses within the operation. KPIs can be used in the development of both short- and long-term goals to improve the productivity of the feed mill.

Manufacturing and Delivery Productivity
KPIs within the productivity category include tons per run, pellet mill changeovers, bagged tons per day, actual versus scheduled hours of operation, downtime, tons delivered per load, and load-out waiting time.

Tons per run can be monitored in both the batching and pelleting areas. A mill that manufactures only mash feed should measure the tons per mash run, whereas a feed mill that pellets feed should track tons per pellet mill run. A high number of tons per run indicates that the feed mill minimizes the number of times the operator switches to a different feed formula either in the mixing or pelleting process, which will increase the tons of finished feed produced at the mill.

Pellet mill changeovers are the number of times the pellet mill switches to a different feed formula each day. This number is also used to calculate the tons per run. Managers can multiply the number of changeovers each day by the average time required to stop one run and start the production of the next run in order to calculate the potential loss in manufacturing capacity each day. These “opportunity tons” indicate how many additional tons of feed could be produced at the feed mill.
Bagged tons per day provide a measure of how many tons the bagging line can package each day. The productivity of the line can be influenced by the type of product, bag type, and location of the finished product in the warehouse in relation to the bagging area.

Actual versus scheduled time is the number of hours a feed mill operated each week in comparison to the scheduled time. Scheduled time is typically calculated by multiplying the number of shifts per week by the hours per shift. Feed mills that work more than the scheduled hours each week should analyze what factors contributed to the extra hours, such as the manufacture of feeds that are difficult to pellet due to the formulation, equipment breakdowns, additional feed demand, lack of ingredients, problems associated with delivery of the feeds, and low employee productivity.

Downtime hours are the time each week that the feed mill is not manufacturing feed. Downtime may occur due to a planned shutdown for preventative maintenance activities, but in most instances downtime is unscheduled by the manager. Unscheduled downtime may be due to the lack of ingredients required to manufacture feed, the mechanical breakdown of equipment, or a shutdown because the finished feed bins are full of feed.

Tons delivered per load measures the net tons delivered on each delivery in comparison to the legal weight that could be delivered. Tons per load can be affected by the weight of the truck and trailer, the scheduling department, load-out operator, and accuracy of the load-out system. Companies that have a variety of delivery equipment with different weights should also track the tons loaded and delivered by individual trucks.

Load-out waiting time measures how long each driver spent waiting at the warehouse or bulk load-out to get the truck loaded. The time should be tracked from the time the truck enters the mill site until the time that the truck exits the site. Multiple trucks at a bulk load-out during shift changes can create extended wait times, which reduces the overall efficiency of the bulk delivery. The loading of van trailers can be impacted by the lack of experienced warehouse forklift operators, the location of the product within the warehouse, and the overall organization and logistics within the warehouse.

Labor Productivity
KPIs within the labor productivity category include tons per man hour or man hours per ton, overtime hours per week, and tons delivered or miles driven per driver. Tons per man hour or man-hours per ton provide a measure of how many tons can be produced per man-hour, which is reported in integrated feed milling operations.
where the focus is on high production per employee. Man hours per ton are typically measured in commercial feed mills where more labor is required for the manufacturing and packaging process of feed due to the production of small batches of specialty feed or production of feed based on individual customer orders. **Overtime hours** each week are the hours that an employee worked over the standard 40-hour work week. In some instances, overtime may be built into the system with employees working five 10-hour shifts, in which case the manager may choose to track overtime hours as those over the scheduled hours per employee. Overtime hourly wage rates are typically paid at a higher rate than the base hourly wage. Therefore, a feed mill that operates with a high percentage of overtime in comparison to a 40-hour work week will have a higher labor cost. The events that contribute to overtime during a week are normally the same as those that increase the actual mill operational hours versus scheduled hours. **Tons delivered or miles driven per driver** measures the efficiency of a driver and the delivery system. Systems that deliver to farms or customers within a short radius of the feed mill may evaluate efficiency based on the tons delivered each week per driver. Mills that deliver to a wide range of distances may want to track both the number of miles driven and tons delivered per driver, which takes into account the added time required for long-distance trips.

**Manufacturing and Delivery Cost**

KPIs within the manufacturing and delivery cost category can be grouped into personnel, property, and operating cost for both manufacturing and delivery. However, there are multiple line items within each of these groups that influence the total cost of the operation. Managers should also recognize which of these costs are within their direct control and concentrate their efforts on making changes in those key areas. Many of the items previously outlined in the manufacturing, delivery, and labor productivity sections will affect these costs. However, when analyzing items such as utility costs, the manager should focus on the units consumed at the feed mill (kWh, gallons of fuel, and MCF of natural gas) versus the energy cost per ton. The cost per unit of energy is typically set by local and state power and gas companies and is often outside the direct control of the manager. Energy costs are also based on the region of a country and influenced by global energy markets. Finally, the cost of shrink at a feed mill can dramatically affect the bottom line of the company and therefore must be closely monitored. **Personnel costs** can be linked to the employees at the feed mill and include management and staff salaries, hourly wages, benefits (taxes, insurance, retirement plans), uniforms, employee personal protective equipment, safety bonuses, and employee appreciation programs. **Property costs** are all the costs associated with the physical site and feed mill and include depreciation, property tax and insurance, equipment repair and preventive maintenance, die and roll cost, and equipment and vehicle leases. **Operating costs** are associated with daily operation of the feed mill and include feed mill utilities (water, sewer, electricity, garbage, and boiler fuels), vehicle fuel and oil, feed mill supplies (boiler chemicals, greases, oils), office supplies, communications, and railcar demurrage. **Shrink/Gain costs** are associated with the loss or gain of ingredients and feeds. Feed mills typically experience a shrink in ingredients due to losses that occur during the receiving and grinding processes. Receiving losses are typically in the form of dust or product loss, whereas during the grinding process there is a loss of moisture. A mill that produces pelleted feed may experience a gain in feed due to residual moisture left in the feed after the cooling process. Mill managers may find it helpful to calculate the shrink and gain of both ingredients and feed separately, as well as the total shrink (gain) of the feed mill. The total shrink (gain) can be determined by the following equations (Emmerson, 2005):

**Expressed by weight:**

\[
\frac{\text{Beginning inventory} + \text{receipts}}{\text{Ending inventory} + \text{shipments}} = \text{Shrink (Gain)}
\]

**Expressed by percentage:**

\[
\text{Shrink (Gain) by Weight} \div \text{Shipments in Weight} \times 100 = \% \text{ Shrink (Gain)}
\]

**Shipments by Weight**

**Expressed by monetary value:**

\[
\text{Shrink (Gain) by Weight} \times \text{Monetary Value/Weight Unit} = \text{Monetary Value of Shrink (Gain)}
\]
Summary

A manager should remember that you cannot manage what you cannot measure. Developing KPIs is only the first step in the process of reducing the cost of feed manufacturing and improving the productivity of the feed mill. The KPIs must be routinely compared to targets on a weekly, monthly, and annual basis. The productivity and costs associated with the production of a quality feed require a commitment from management, operators, and maintenance personnel to control personnel, property, and operating costs. The management team must communicate to its employees the importance of their jobs and how their actions affect productivity and operating costs at the feed mill. Managers should use KPIs to develop short- and long-term goals that will drive an improvement within the operation of their feed mill. Unfortunately, sometimes KPIs get used as a scorecard to compare operations within a company or to its competitors. Although it is important to understand how you compare to others in the feed industry, it is more imperative to understand those KPIs that most strongly influence your productivity and costs in order to focus efforts on improvement in those areas that increase profits or lower the feed mill operating cost.

Reference


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