Executive summary

The food and beverage industry is a high-volume, fast-moving, low-margin business. In addition to its market dynamics, which are driven by retail giants, there is an inherent complexity to converting ingredients and raw materials into food and beverage products. From time to time, the same recipe may consume more materials or produce less of the desired product, depending on a wide range of factors in the supply chain, the production process and the environment. As a result, measuring costs is a science in itself.

Making a profit in this industry through cost control is all about waste—minimizing waste. Waste in the food and beverage industry can be caused by a number of different factors such as lost sales, forecast inaccuracies, production downtime, yield losses, inferior product quality and aging stock. This white paper deals with the different components that need to be in place in order to help you gain control of costs and waste.

Our experiences tell us that you need a well thought-out process from financial budgeting all the way down to daily operations inside a production plant. A modern enterprise management system with integrated costing and yield management capabilities is all but essential — but not sufficient. It is also vital to motivate and enable the organization to collect the detailed and timely data necessary to understand which products and customers make you money and which lose you money, which processes are eating into your margin and which can be improved to contribute more on the revenue side. That level of insight requires the use of analytics to extract business intelligence from the data you accumulate every working day and serve all decision makers and plant-level personnel with necessary information to continuously improve operations.

Making way for giants

Cost control and revenue generation are dynamically linked in the typical food and beverage company. On the operations side of the business—purchasing, supply chain, logistics and manufacturing—managers need to make sure that they are utilizing resources and running as efficiently as possible. On the other side of the business—the marketing, product management, and sales organization of a branded goods manufacturer—managers spend vast amounts of money on promotions, advertising and sales incentives and must track return on investment carefully.

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Both sides of the organization face the same challenges and feel the same pressures.
The big retail chains rule. They own and dictate the supply chain; they set the rules, define the space and dominate competition. A supplier has to follow their rules, terms and conditions even to be allowed to distribute goods into their structure. This has been the state of affairs for many decades.

Over the last one or two decades an increasingly competitive environment has developed. The giant retailers have begun competing more or less directly with their suppliers by introducing private labels. Owning house brands gives them full control over both the cost side and the revenue side. On the one hand, as brand owners, with or without their own production capacity, they have, or demand, a much better insight than before into what it normally costs to produce the goods (say a jar of jam or bottle of beer). On the other hand, as retailers, they can calculate and manipulate consumer demand using very detailed point-of-sale data which is generally not available to a supplier trying to compete for shelf space.

**Double leverage for giant retailers**

Retail chains that do not have their own production capacity can source goods either from pure-play, private label manufacturers or from their “old” suppliers who now combine the roles of competing brand owners and “co-packers.” In either case, the detailed insight into production costs that retailers demand puts more pressure on the cost side of the supplier’s business — even as the retail giants also demand a larger part of the final margin. The “old” suppliers may either refuse to produce private-label products and try to grow their own brand or use private-label production to increase utilization rates in their plants and spread fixed costs across larger production volumes. Today many suppliers are forced into this combined role to stay cost competitive and continue to develop their production skills.

Many established consumer product brands are finding their market share eroded by private label brands. These private label brands are not just competing on price anymore but are delivering innovative new products. Consumer are seeing many of these private label brands as peers to the consumer product brands. The result is that consumer are often more brand loyal to their retailer than the brands that they are carrying.

This change in behavior impacts the leverage that consumer brands have in the marketplace. Going into negotiations with retailers, they are handicapped. They can’t increase their price by three or five percent to cover rising costs even if they want to. Though typically they have quite heavy marketing budgets compared to most other industries, brand owners can’t reach consumers as directly and easily as the retailers do. Instead they have to squeeze their own operations—increase productivity, go back to their suppliers to reduce the purchase price of raw materials, push it all the way back to the farmers and growers—to make their margins.

The retail giants are so large that suppliers can’t really afford to lose one of them. Even if they have to squeeze costs and suffer margin cuts, the suppliers will try to keep the giants as customers because they buy such large volumes. That’s why cost control is such a significant part of daily life for brand owners. You have to look at your utilization rates and production costs and watch how they develop week by week and month by month, and evaluate your options for controlling sales prices and managing marketing costs, from promotions to annual bonuses.
Controlling what you can control

When creating their marketing plan, brand managers know their assortment, their key customers (in most cases), roughly what volume of products and prices they can expect and the marketing investments needed to support these volumes. They make their budgets based on this information and then constantly measure against these targets and goals. At a high level, senior managers and their reports keep track of sales targets and revenue goals by revising budgets and forecasts on a monthly or quarterly basis, keeping on track, looking ahead—always trying to protect the margins they had predicted. This effort requires close monitoring of the actual cost of sales.

On the operational level, the plant and supply chain managers have to track and control production costs on a continuous basis. This effort requires advanced product cost calculation models to define all cost drivers at a fairly granular level. These models include the costs for different kinds of raw materials and packaging materials as well as for energy, water, setting up and running the production line, paying the workers, and all the other cost elements.

Today managers have to work on a fairly sophisticated level to be able to meet the predicted levels of cost, price and margin on a continuous basis. What are the actuals on a daily or weekly basis so that you know that you are on track? If you slip off track, what do you need to do to get back? Should you adjust your production processes or adjust recipes, or was the cause inadequate raw material quality? To implement corrective actions in a timely way, you need to receive alerts and notifications on a regular basis. You have to capture mounds of data in order to properly capture actual costs and precisely allocate them to specific products. Data capture tools such as sensors may feed that data directly into the enterprise management system; mobile tools used by receiving or production personnel may cover other parts of the process. Ideally, the mobility solution is integrated with your enterprise management system so that you have real-time data.

Yield and mix variances

All food and beverage manufacturers involved in processing and converting raw materials strive to maximize yield, with 100% yield being “the holy grail.” Yield, the relationship between what you consume and what you are able to produce, can in theory be 100%, but in practice, there are almost always some losses or variations.

But yield is not the only explanation for variances in production. Results cannot be monitored and explained by a pure ratio between input and output but may depend on a number of factors. Improved output might be due to having, for instance, a certain fat content or a certain grade or composition of chicken. Also in many food production processes, you are mixing different ingredients or different grades of the same ingredients. Depending on the availability of material, as well as its characteristics and costs, you may mix in different proportions to reach a proper end product. Variations due to changes in input are normally defined as mix variances. Most production processes need to be analyzed both from a yield- and mix-variance perspective.
Mix versus yield variances

Yield variance—the cost impact of generating more or less output from a standard mix of raw materials.

Yield variance is the part of the cost variance in the total cost of materials related to the variation in the yield or output obtained from the materials used i.e. the standard output that should have been achieved for the actual input and the actual output/yield. Note, a pure yield variance assumes a standard proportion or mix of different materials and grades used as input.

Mix variance—the cost impact of using different proportions of raw materials.

Material mix variance is the part of the cost variance in the total cost of materials related to a variation in standard mix of materials (the standard proportion of materials to be mixed) and the actual mix (proportion in which they are actually mixed).

Source: http://www.accountingformanagement.com/mix_yield_example.htm

Managing yield by controlling grades and attributes

The ability to analyze various grades or attributes in the raw materials can help you explain ups and downs in the yield. Yield means different things for different industries and segments. In dairy, for instance, it is crucial to measure and monitor the butterfat content in order to control the process and understand the yield and value from the raw milk provided by the farmer. In a livestock environment, what would normally concern a processor is the ratio between input (the number and weight of whole chickens) and output (e.g., the parts like legs, wings, breasts and offal). Here, you strive to maximize the ratio of the most valuable parts like the breast. In the case of grain, fruit and vegetables, processors strive to minimize by-products like peel, bran, seeds, and so on.

That same data is used in vendor selection and evaluation. Suppliers have to fulfill certain standards. You pay the supplier based on receiving certain grades, attributes or characteristics; you don’t pay the same price for every chicken. For example, too high a fat content might degrade the material for your purposes and thus lower the rate your supplier can charge.

Patrik Sjoberg, food industry product director for Infor®, illustrates the benefit of analytics applied to yield management with an anecdote from his experience working for a food manufacturer producing potato products. Sjoberg recalls, “We used to have a very dedicated plant manager who was completely focused on maximizing the potato yield. He had long-term experience in the potato industry and had collected decades of statistics about how the size of potatoes in a lot varied according to the statistical bell-shaped curve (see Figure 1). A small proportion of the potatoes were large enough to produce premium french fries. The midsize potatoes could then be used for ordinary french fries while the fraction of small potatoes only served as input for mashed potatoes. By maximizing the purchase of large potatoes at a reasonable price, he could maximize the yield of premium french fries and thus maximize the profitability of the overall potato business.”
Grades and attributes are important to the Infor product costing concept and all batch or lots can be associated with a number of different attributes. With Infor Food & Beverage, you can base product costing and evaluation on the weight of attributes or characteristics. If you have similar materials or products where a higher or lower fat content (or sugar or protein content, or any combination of defined attributes) makes a difference, you can use that data to allocate or define the costs. It is crucial to control these attributes in materials handling and resource utilization. It affects the outcome of the average yield and the sales value. In the example of the butterfat content of milk; generally the more fat, the more value. Capturing that information is crucial because it will help you explain and control your production process, and thus maximize yield.

Yield management then and now

Historically, backflushing techniques were used to account for quantities consumed in production. Backflushing automatically withdraws ingredients based on your recipe and correspondingly reduces the on-hand quantities recorded in the enterprise management system. The use of standard quantities was meant to compensate for the fact that there was no way to capture real-time data. An attempt to improve accuracy meant that you performed daily or weekly inventory counts on critical ingredients to find out actual total consumption and then spread the variances back to the products on a pro rata basis.

Backflushing is still being used and in some environments it can actually be the only possible option. But what we see more frequently today is real-time production monitoring. Producers are trying to measure what is actually consumed in the process, whether it ends up in the product or as scrap, by using electronic devices to capture the inputs. Integral and mobile data capture tools make important contributions to ensure a high level of accuracy; product monitoring is inherently more accurate than backflushing. Ingredients and raw materials still account for most of the product cost. You have to be very precise in how you handle ingredients and measure consumption; the degree of precision determines whether you make or lose percentage points on your final production costs.
Catch weight challenges in relationship to costing

Certain food categories and industry segments measure inventory by catch weight (also called variable weight). At the manufacturing or wholesale level, for example, you normally keep track of hard cheeses by “eaches” or “pieces”—the number of wheels produced or shipped—and that is how you count them in your warehouse or in production. Let’s say a wheel of hard cheese averages 10 kilos; however, due to normal variability, an “each” can vary up or down by half a kilo. Despite the weight variance, they are all good cheeses. An “each” is normally cut into smaller wedges for retail sale, and the end consumer pays a price per wedge based on its actual weight in pounds or kilos.

In many enterprise management systems, you can only keep track of one SKU (the cheese wheel) if you treat it as an “each” or “piece.” In those systems, you will have to evaluate and control your inventory value, variance calculations and yields in the same way. This introduces a discrepancy between the measure used in logistics handling ("each") and the measure used in costing and pricing in retail sales (wedges, by kilos or pounds).

By contrast, Infor™ Food & Beverage allows these two different units of measure to be tracked in parallel. This means that if, for example, the “piece” is a 9.7 kilo wheel, you can assign the purchase price, sales price, retail price, and allocate costs through the supply chain on the basis of 9.7 kilos because the weight in kilos (or pounds) is really the driver behind internal cost control and revenues. You can also evaluate yield in production based on the weight rather than the “piece” unit, which gives you the ability to compare and evaluate the number of raw material kilos or pounds consumed versus the number of kilos or pounds of end products. Nobody really cares about the “piece” when you talk about cheese or livestock; the actual weight of usable material or product that you are acquiring or manufacturing is what dictates the value to you and the price to the consumer. That is a key concept for inventory and cost control in a food environment.

Best practices for business intelligence

Important as it is to capture data from the production process and goods received, in order to derive value from the data, you need to be able to analyze it using sophisticated order costing and variance models on a timely basis. Patrik Sjoberg says, “Many of our customers today run their analytics on a daily basis or make a fairly advanced analysis of key indicators. The best practice we see is to feed back to operations such information as planned costs versus actual, planned production versus actual, how much they normally should have consumed in terms of labor, time, costs and quantities versus actual, throughput, and downtimes and utilization rates of key resources. Such feedback enables them to adjust and optimize operations on a daily basis. Food and Beverage manufacturers who are really on top of their performance do this continuously.”

The involvement of plant-level personnel and data feedback on operational levels is mandatory in most of these successful companies. You can find printed or even digital scoreboards in each production department guiding and encouraging all production personnel on a daily basis. No longer do they have to wait for the monthly or quarterly report to see where they are heading. Everybody knows immediately and can help to contribute to the improvement process on a daily basis.
Why Infor?

Infor Food & Beverage offers an effective way to capture and control data, define recipes and bill of materials, and can effectively cost them. Sjoberg says, “What we’ve seen and learned through the years is that different industry segments, even within the food industry, want to define cost structures in different ways. A feed manufacturer, ice cream manufacturer, and meat processor all deal with cows, but they each do so in their own way. Both as a group and as an entity, they have different needs from the maker of jelly beans or beer. They have different drivers, different cost elements that they want to control, and they don’t want to be forced into using an inappropriate method that they have to work around.”

Any solution for the Food & Beverage industry needs to be highly dynamic to manage the many variables commonly associated with it. For that reason, Infor Food & Beverage offers:

- A highly configurable way of defining product costs using very granular measures so that manufacturers can define and roll up both their direct costs (e.g., materials, manufacturing and brand label costs) and their indirect costs (e.g., admin, lab personnel, quality assurance or reallocated costs for shared resources such as energy).

- An advanced way to define many cost drivers, such as:
  - Number of hours that the production line runs
  - Number of kilos/liters or pounds/ounces/gallons produced
  - Number of lots consumed or purchase orders executed

The tracking of indirect cost elements is part of the Infor ABC costing/closed loop budgeting concept. It means that at the end of a period or process, you can look at the actuals for any component or shared resource and compare them to what you have been allocating on a continuous basis. You can then use the result to define and refine your overhead cost calculations. It enables you to adjust your cost model by adding back factors that were not quantified precisely before. This capability is important for any company committed to the continuous improvement of cost control and resource utilization.

The Infor advanced analytical capabilities aggregate and extract the business intelligence latent in your data and make it available to the organization in an easy-to-consume format. Infor has prepackaged the main reporting capabilities that the shrewd manager needs to use to control operations, all the way from purchasing to manufacturing, distribution and sales. These include:

- Standard data marts
- Analysis cubes
- Template reports

Sjoberg says, “My experience with business intelligence, based on seeing many companies use it, is that many of them spend months and years building their own business intelligence solutions. But nowadays companies are so thin on resources they cannot embark on such long and resource-consuming endeavors, but they still need business intelligence. We at Infor offer a solution that is close to being ready for use. Our customers normally want to tune the output to fit their own way of analyzing data, so we have made the reports easy to adapt. The company should not need to hire consultants—super users and even advanced end users can tweak these reports themselves.”
About Infor

Infor is fundamentally changing the way information is published and consumed in the enterprise, helping 70,000 customers in 194 countries improve operations, drive growth, and quickly adapt to changes in business demands. To learn more about Infor, please visit www.infor.com.

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