

## **CASE 6-2**

### **Real-World Case**

*Enterprise Solutions for Fruit and Vegetable Beverage Manufacturing*

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Fruit and vegetable beverage manufacturers face a set of unique issues from all other beverage sectors. From safety to organic technology, solutions rarely address the gamut of the idiosyncratic requirements.

**VARIABLE INPUTS/CONSISTENT OUTPUTS**

The challenge for most fruit and vegetable manufacturers is that ingredients come out of the ground and can have various characteristics (an orange picked in June may have different characteristics than an orange picked in August), while customers require the finished product to be consistent. To manage variable characteristics of lots, enterprise resource planning (ERP) solutions must track lot attributes; few offer this capability. Typically, fruit and vegetable attributes are captured such as Brix/percent solids, pH/acidity, and other similar characteristics. When a lot is issued to a production batch, systems such as escape velocity systems (EVS) calculate the expected chemistry of the finished product and compare it to the specifications defined for the finished good. If the batch is out of the required specifications, the system warns the production manager.

**PURCHASING CITRUS**

In the citrus industry, most juicers do not purchase pounds, gallons, tons of fruit; they purchase “pound solids.” Essentially juicers are purchasing the sugar that is in the fruit, not the water content. Sometimes a trailer of oranges can be 5,000-pound solids; sometime the same volume can be 4,000-pound solids if the fruit has more water and less sugar. The difficulty is they will issue the fruit into a batch by weight or volume. The relationship from pound solids to weight or volume is not a linear relationship; therefore, the technology solution must have the capacity to facilitate multiple, nonrelated units of measure on a lot basis. The O2 ERP system is one of the very few technologies that provide this capability for juicers.

**CUSTOMER/ITEM SPECIFICATION**

According to Evan Garber, President of EVS ([www.evs-sw.com](http://www.evs-sw.com)), “Many times a customer will have specifications for a juice that is different than the company’s specification for the product . . . the company manufactures orange juice with between 30 and 40 percent solids, a client may require that the orange juice that they get be 37–40 percent solids. ERP solutions must allow a fruit beverage company to manufacture to the company’s specification, the customer’s specification or when picking for a sales order, perform a “best-fit” of existing products to meet the customer’s requirement.”

**GROWER ACCOUNTING IS COMPLEX**

Sometimes fruit and vegetable manufacturers purchase from growers. The accounting process is often complex and must produce settlement sheets (based on when finished goods made by the material purchased is actually sold), including charge backs and commissions. Additionally, the technology solution must be able to keep vendor-specific information about purchased items, such as whether they use pesticides, fertilizers, acreage, and other pertinent data.

**QUALITY CONTROL: FOOD SAFETY INCLUDING HACCP**

The usual quality control and food safety issues apply to fruit and vegetable beverage with some additional concerns. Some of the Hazard Analysis Critical Control Points (HACCP) are for sterilizing the fruit upon receipt (such as bleach concentration, temperature on the pasteurizer, and metal detection on the finished goods).

### LINE SCHEDULING

Fruit and vegetable beverage manufacturers deal with allergens. Allergen tracking is important, as well as color/product scheduling issues. Production scheduling must optimize a production schedule based on attributes of the formula; apple products should be run before blueberry products and nonallergens before allergens. The ERP functionality must capture the cost-saving benefit of minimizing changeover time.

### KOSHER/HALAL CERTIFICATION

Some juice manufacturers make Kosher and Halal beverage products. Garber suggested, “Any technology solution must indicate whether a formula is Kosher or Halal. O2 is one of the few batch or recipe process manufacturing ERP systems that allow a user to indicate formulas that are Kosher or Halal. Whether Muslim in the case of Halal certification or a Rabbi in the case of Kosher certification, both will typically review formulations as well as historical production to verify that Kosher or Halal products have been used. The ability to print and view all formulas and ingredients that have a designation is vital and must be true of historical production batches.”

Other ERP functionality for these two designations include the requirement of “source of ingredients” because of the direct relationship to lot tracking of raw materials from procurement through production to finished goods. The requirement of “status of production equipment” relates to machines that only run Kosher or Halal items (given the cleaning specification of both food designations). Garber also noted, “Production planning (finite capacity) rules can be set to state that a section of formulas are only run on certain machines. If a planner tries to run on another line, the schedule board will prohibit it from moving. Production history can be updated for the machine indicating that a batch was actually run and received the required verification that batches were run on proper equipment. Indicators that the needed blessing has been made to a particular batch, item, or lot can be indicated.”

### PRIVATE LABEL

Many times a manufacturer will produce private label products—the juice is all the same, however it is packaged in multiple unique packages for different clients. An ERP system must allow for the manufacture of coproducts and define different packaging based on each SKU.

### EXPIRY DATES AND SELL-BY DATES

Fruit and vegetable beverage manufacturers use ingredients that have very short expiration dates. Some industries (like citrus) squeeze all the fruit right away, package some, and make the rest concentrate and freeze; others store the fruit in coolers until they are ready to use them. The latter process is constantly in a race against time to use the fruit before it spoils. ERP systems must track lot expiry dates; when creating picks for production batches, it is best if the technology selected can suggest the oldest lot (or first to expire) for the batch.

### LANDED COSTING

The cost of shipping of materials can be a significant portion of the material cost. Many fruit and vegetable manufacturers need to have the total cost of receiving an item included in the cost of material; this requires landed costing functionality.

### THE ORGANIC ELEMENT FOR FRUIT AND VEGETABLE BEVERAGES

Throughout the grocery industry, affluent shoppers are attracted to organic fruit and vegetable beverage choices; this marketing strategy creates a required organic authentication process for all who provide these products.

A high-ranking executive of the Soil Association suggested to Chris Mercer, editor of BeverageDaily.com, that organic food could capture around 30 percent of the food market. Mercer suggests, “Organic food sales are rising . . . surely that only suggests that people are dissatisfied with the quality of food they ate before.” While consumers may want better tasting, healthier, and locally grown products, safety and quality issues must validate the perceived benefits of organic food products.

Some of the essential characteristics of organic systems include design and implementation of an “organic system plan” that describes the practices used in producing crops and livestock products; a detailed record-keeping system that tracks all products from the field to point of sale; and maintenance of buffer zones to prevent inadvertent contamination by synthetic farm chemicals from adjacent conventional fields.

According to the U.S. Agriculture Department, “organic” food is produced by farmers who use renewable resources and conserve soil and water; animals are given no antibiotics or growth hormones. Additionally, there cannot be any conventional pesticides, petroleum-based or sewage sludge-based fertilizers, and genetic engineering or radiation. “Natural” does not mean “organic”; natural usually means a product is minimally processed and contains no artificial ingredients or added color.

Organic food must have at least 95 percent organic ingredients and list which ingredients are organic in order to use the USDA seal, and it must list the certifying agent. “Made with organic ingredients” means at least 70 percent organic ingredients are contained in the food product, and it must list which ingredients are organic, yet are not permitted to use the USDA seal.

Some question the safety of organic food. It is a common misconception that organic food could be at greater risk of *E. coli* contamination because of raw manure application (although conventional farmers commonly apply tons of raw manure with no regulation). Organic standards set strict guidelines on manure use in organic farming: It must be either first composted or applied at least 90 days before harvest, which allows ample time for microbial breakdown of pathogens.

### THE CONTROLS REQUIRED FOR ORGANIC QUALITY

Garber insisted “ERP vendors must support organic producers in food processing and manufacturing, as well as full distribution management throughout the entire supply chain.”

Indeed the record keeping required to authenticate “organic” status is significant, costly, and comprehensive. Some of the key features technology solutions must provide to ensure organic standards include the following:

- Record keeping for organic raw material purchases
- Country of origin tracking of purchases
- Organic supplier tracking
- Separate organic product storage to prevent product comingling
- Hazardous chemical tracking and reporting to prevent contact with prohibited substances
- Online processing procedures to ensure adherence to compliance standards
- Online record keeping and audit trails for fast compliance reporting

The few technology solutions providers who understand the range of these special needs recognize that one size does not fit all when it comes to fruit and vegetable beverage manufacturers; the unique issues of this beverage sector requires unique solutions.

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#### **CASE QUESTIONS**

1. What are some of the tracking issues a fruit and vegetable manufacturer must utilize in an ERP to better ensure success?
2. What is an “organic system plan,” and what are some of the key features an ERP must include?
3. Why are some manufacturing systems specific to a product?