

Food and beverage: Trends and implications

Changes in demographics and consumer behavior are putting pressure on brands of every type in the food and beverage industry to become more nimble while at the same time putting an even stronger focus on food safety. A cursory review of trend stories in industry publications and market analyst reports reveals a recurring theme of fragmenting markets being served by a growing diversity of suppliers with a dizzying range of new products and packaging options.

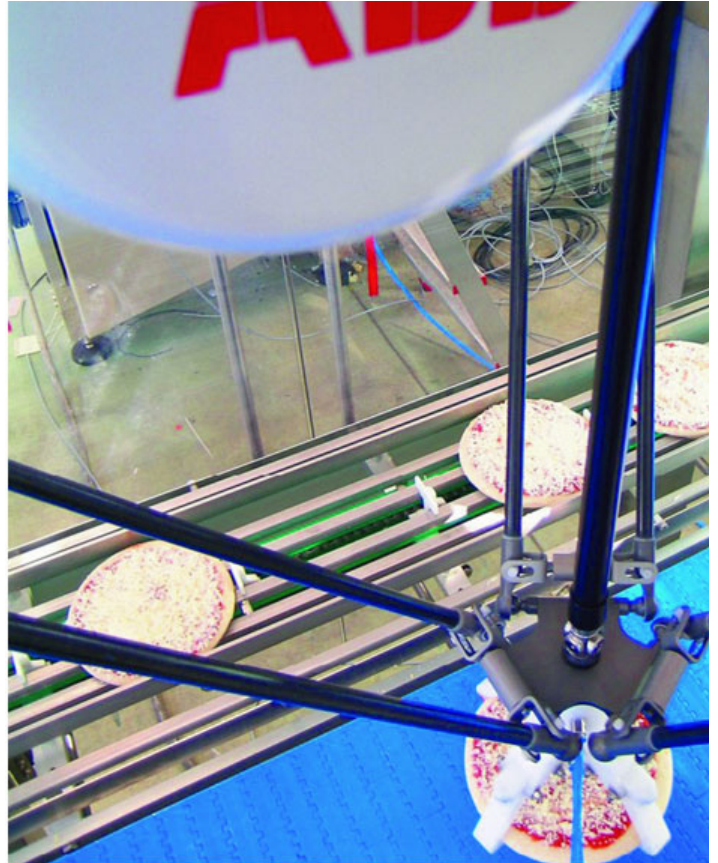
All this variability carries implications, though, for the systems, equipment and processes that food and beverage companies rely on. In the following sections, we examine three broad trends currently shaping the industry—food safety, healthy eating and market fragmentation—and consider what impact these might have on those systems and equipment.

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Food safety

Food Processing magazine's 2015 Capital Spending Report ranked food safety as the number one concern for food and beverage producers. It's not likely to slip from the top of the list. Aside from the obvious moral and ethical imperatives, the costs associated with a contamination incident or incorrect labeling are high. Recalls are expensive, \$10 million to \$30 million on average, but even a momentary interruption of production to address a possible contamination issue can have a substantial financial impact. High-profile public incidents can damage brands for years.

But given the nature of the industry today, with many brands relying on a stable of suppliers to produce their products for them, safety doesn't begin and end with the company whose



Hygiene is a top concern in the food and beverage industry

logo appears on the final product. It is essential, then, that the brand owner has visibility into the complete value chain to ensure safety, not to mention product quality. This implies a level of integration between the brand's food safety management system (FSMS) and that of the supplier and often distributors and retailers too, ideally using real-time data.

Inside the producer's facility, precise machine and line measurement and controls can help to not only reduce waste and improve product quality but also ensure food safety by keeping the operation running within safe parameters. Similarly, power systems that keep processes running during grid disruptions protect electrical equipment while also avoiding contamination and subsequent waste from process stoppages. A voltage sag of even a few seconds in dairy processing might require an entire product batch to be pasteurized a second time or scrapped.

The focus on safety will also drive the use of equipment designs that minimize contamination risk (e.g., by eliminating bacteria-attracting crevices and ensuring seals that stand up to frequent high pressure wash downs). Motors designed without fins, for example, can dissipate heat without creating an environment for pathogens to flourish. Stainless steel instrumentation, conduits, electrical fittings and even robot grippers also help to ensure uncompromised hygiene.



Healthy eating

Amy's Kitchen, a specialty food processor, saw a 30 percent increase in demand for vegetarian frozen meals last year according to Food Processing. Their experience is indicative of a broader trend toward more fresh foods, more natural foods, less artificial additives and generally "eating healthy", not to mention environmentally responsible packaging.

Interestingly, though, this trend plays out differently among different groups. For example, as aging Baby Boomers develop ailments that require dietary changes, younger consumers are focused more on organic foods and removing artificial ingredients from their diet. Even the changing racial profile of the country has an impact: the rapidly growing Hispanic community has a robust home cooking tradition that is evident in their demand for fresh foods compared to processed items. Industry analyst firm Mintel also notes significant growth in consumer interest regarding sports-related nutrition.

From a global perspective, Chinese consumers are also jumping on the healthy bandwagon, though in their case the appeal of US products has also to do with food safety concerns. The US has a strong reputation for food safety and in the wake of some high-profile incidents among local producers, American suppliers offer a compelling alternative.

The implications of this broad trend toward healthy foods are potentially wide ranging. The shift to more fresh foods and fewer preservatives points to improvements in packaging, supply chain efficiency and anything else that can reduce the time between farm and grocery store. Quality control within the process similarly must be optimized to meet consumer expectations and increasing regulation.

So, solutions such as robotic pick-and-pack systems that can handle high volumes without significant damage are likely to become more attractive. Some producers might look to entirely new processes. For example, the Food Processing report shows a growing interest in sous vide cooking, which not only offers higher nutrient retention but also 20-30 percent less shrinkage during cooking.

Consumers want to know not only what's in the food they eat but where it came from and how it was prepared. That in turn puts pressure on food processors to be transparent in their operations. Automation systems that provide visibility across the entire value chain, including suppliers, are likely to become the norm going forward.

Market fragmentation

Food is inherently variable due to seasonality and rapidly shifting consumer tastes, but the industry is becoming even more so as brands of all sizes look beyond the mass market to smaller but still profitable segments and locally tailored offerings. This movement toward market fragmentation actually includes a number of specific trends that all contribute to an increasing level of granularity among consumers and in turn the products they buy.

For example, Mintel's "Global Food & Drink Trends 2016" report notes that several formerly "alternative" foods are now becoming part of the mainstream. "Novel proteins" like veggie burgers and tofu have made significant inroads. New products based on these foods may require new processes, but the overall implication here is the need for greater flexibility.

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Food Manufacturing cites several trends that point to shorter production runs, more targeted marketing and a need for innovative cost solutions both in terms of process and products. But perhaps the most visible evidence of market fragmentation is in the beverage sector. A recent FPSA Beverage Council paper describes consumers moving toward niches, and suppliers striving to produce products that fill them.

More meals are being consumed individually, too, both at home and in restaurants. This carries implications mostly for portion sizes and packaging, but it's just another example of the range of market forces that are driving the diversification trend. These changes are driving food and beverage makers to accommodate more product and packaging variations from the same line, and to quickly adapt to shorter product cycles while maintaining food safety and profitability.

"As production runs become increasingly compressed," the report states, "some say equipment and system efficiencies will need to be re-baselined to account for the increase in internal inefficiencies. On the other hand, many believe it is an opportunity to boldly re-think production lines, plant layouts and production equipment"

Indeed, there is much to consider. Greater automation allowing quick and easy adjustments to a given process, reduction of sanitation and cleaning times, faster changeovers, and even easier access points to equipment are all cited in the report. Processing equipment must be robust and flexible, able to shift easily between sizes and with greater flexibility in blending, pasteurization and packaging. Robotics in particular will play an increasingly vital role in meeting these requirements while also eliminating human contact with open food.

Outlook on spending

Industry observers paint mixed picture with the industry ready to take on these myriad challenges while also facing market headwinds at the same time. Operational expenses are as much as 75 percent of the total costs in many food and beverage sites, therefore there is also a strong focus

on operational investments to improve competitiveness. Manufacturers are increasing automation investments to improve performance metrics like Overall Equipment Effectiveness and Asset Intensity. Interestingly, despite record low fuel prices, half of respondents indicated they have ongoing efforts to reduce electricity use in their operations, something Food Manufacturing also noted in their outlook for 2015.

The good news is that while energy cost can be high in electrical and thermal processes, it is often one of the most controllable costs, as opposed to many uncontrollable elements such as labor and commodity prices. Food processors can identify many opportunities to do more with less energy, from reducing the consumption of motors, pumps and fans to putting otherwise wasted energy to work (e.g., using centrifuge braking energy).

As to the issues of transparency and process agility, automation can help and while it was ranked as a "concern" mostly by firms outside the US, 70 percent of respondents in the Food Manufacturing survey said they will automate some portion of their process this year.

The future for the food and beverage industry is bright, but there are significant challenges already in play. The brands that can adapt quickly while preserving transparency both in terms of their own operations and in their relationship with consumers will enjoy an advantage in an increasingly diverse and competitive market.

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