Grayway

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TECHNOLOGY DOMINATES FOOD & BEVERAGE

TRENDS FOR 2020

WELCOME

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The food & beverage industry is experiencing a true evolution with production, packaging, and delivery all undergoing rapid changes. This shift has ultimately resulted in exponential growth in the sector. Gray is also feeling the growth with nearly 40% of our current projects being food or beverage related.

The swift growth trajectory is expected to continue through 2020 with multiple factors playing a key role. In this issue of the GrayWay, we look at the dynamics – from food safety and technology to plant-based meat alternatives – setting the course for change. I personally can't wait to see how the year unfolds and 2021 shapes up!

Gray practices methods which protect our environment.

FOOD SAFETY, HEALTHIER FOODS, AND TECHNOLOGY DRIVE FOOD & BEVERAGE TRENDS

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FOOD & BEVERAGE TRENDS FOR 2020

Healthier Ingredients, Enhanced Food Safety, Smart Farming, and Big Data Drive Positive Change in the Industry

Customers increasingly expect more from their food—healthier ingredients, fresher food, more food and packaging options, as well as reduced environmental impacts. Transparency is in high demand—consumers want to know how their food is sourced, processed, shipped, and protected during its journey from field to table, which oftentimes happens across continents.

In turn, the food & beverage industry is rapidly evolving, using the latest technologies to identify consumer preferences and trends, create new products, and modernize manufacturing and distribution operations, frequently through the automation of their operations and supply chains. Sensor technologies transmit huge amounts of real-time data regarding quality and storage conditions during the supply chain process. By discovering customer trends and preferences, big data can also enhance marketing campaigns and competitor metrics.

The following five trends will have significant impacts on the food and beverage industry in 2020.

1. Food safety

Food recalls are more prominent than ever before. Researchers have identified more than 250 foodborne diseases. According to the Centers for Disease Control, about 48 million people fall ill from foodborne illnesses every year, resulting in nearly 130,000 hospitalizations and 3,000 deaths. This means that 1 in 6 people in the U.S. become sick from contaminated food every year.

The Food Safety Modernization Act (FSMA) was passed in 2011 to better regulate the food & beverage industry, with special focus on improving the safety of the food supply chain.

New technology is being incorporated to ensure the highest food safety practices and protocols are being upheld.

Consumers are seeking foods that are convenient and practical with more wholesome ingredients.

The Food Safety Modernization Act (FSMA) was passed in 2011 to better regulate the food & beverage industry, with special focus on improving the safety of the food supply chain. To comply with these regulations, food & beverage producers rely on technology to elevate food safety practices and reduce the frequency of outbreaks or other food safety incidents. The FDA is also studying how to use new and emerging technologies to make the food system safer and protect public health. Supply chains can be incredibly complex to transport and deliver time- or temperature-sensitive ingredients or products. Big data tracks food ingredients from the source, through the supply chain, and on to the final destinations. For example, some companies have created food supply blockchains to better track the quality of their products. Sensors monitor environmental conditions during transport. Smart food packaging provides data on conditions within the package and antibacterial liners can deter spoilage and increase shelf life.

Sensors, combined with machine vision and artificial intelligence, can improve food-sorting processes and remove damaged foods from packing operations, reducing spoilage. Data science and analytics can also be used by food & beverage manufacturers to create transparency within their supply chains, thereby building trust with their customers and strengthening their brands.

2. Healthier snacks

Living busy lives has pushed consumers toward convenient, grab-and-go meals and snacks, especially functional foods that provide extra health benefits. According to the Nutritional Business Journal, sales of functional snacks and other foods will reach $8.5 billion in 2020, an increase of 11% over the previous year. Popular ingredients include beet, kale, and quinoa. And, according to a Whole Foods Market survey, consumers are increasingly interested in single-serve refrigerated products, such as eggs, dairy, fruits, and vegetables.

In response to the growing awareness of gluten sensitivities, an increasing number of baked goods are being made with wheat-flour substitutes, like "fruit and vegetable flours, such as banana and cauliflower flours, tigernut flour, and seed flour blends," states Whole Foods. "The inclusion of 'super' flours will also add more fiber and protein power to the mix."

High consumer demand continues to drive market boom for plant-based meat alternatives.

3. Plant-based meat alternatives

Another hot trend is the alternative meat product market, which will continue to expand in 2020. Pea protein is the key ingredient in the popular Beyond Meat products and Nestlé's Awesome Burger. Pea protein is packed with nutrients and is inexpensive to grow and process. According to Grand View Research, the global pea protein market will be worth $313.5 million by 2025, increasing at a compound annual growth rate of 17.4%. This high demand, though, could result in a shortage of supply and higher prices.

"We're going to see other forms of protein from other sources coming into the market, so new innovation will probably rely not just on pea protein, but will rely on other similar sources," says Maria Velissariou, chief science and technology officer for the Institute of Food Technologists. "We'll see alternatives coming into play, as long as they deliver against the texture and they deliver against the flavor."

For instance, companies are also experimenting with a greater variety of plant-based ingredients for their burger alternatives, including mushrooms and chickpeas, or combining meat and plant ingredients. New plant-based products will go beyond alternative beef products to include items that imitate other animal proteins, such as chicken and fish.

4. Milk alternatives

In the dairy space, alternative milk products continue to gain traction as they improve textural and nutritional properties. Popular products include oat, almond, hemp, and soy milk. Other plant-based dairy alternatives are being produced from chickpea and quinoa. Greek yogurt brand Chobani recently launched an entire platform of batch-made oat-based drinks and cultured oat blends, as well as dairy-alternative coffee creamers.

Pea protein is also a highly regarded dairy substitute because it is easily digested, with an abundance of nutrients and amino acids, and delivers the proper texture. "These attributes make the product favorable for use in various food and beverage products, such as protein fortified health drinks and sports nutritional foods," points out Grand View Research. "Significant prevalence of lactose intolerance among infants and children in developing regions, such as Central and South America, Asia Pacific, and Middle East and Africa, is also projected to be a significant driver in the industry."

Technology also exists that can ferment dairy proteins using microflora to create animal-free dairy products.

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From driverless tractors to plant data collection, technology is transforming the farming world.

5. Automated farming

Food & beverage, of course, relies upon the agricultural industry, which is under intense pressure to increase production as the global population increases. Like food & beverage manufacturers, more farmers are using Internet of Things (IoT) technologies to gather data related to their operations. Today's farms are powered by data derived from a variety of technologies, including GPS systems, sensors, robots, and drones. Automated functions include spraying fertilizers herbicides, and self-driving tractors. Abundant Robotics has developed an apple-picking robot that is gentle and precise. Drones provide an abundance of crop information from the sky, including soil variations, plant health, and areas of infestation. Automation has also made big strides in animal husbandry—for example, agriculture innovator Lely has created a robotic milking system that increases milk yields and reduces milking times.

Sensor technologies also monitor key, large-scale environmental factors, such as moisture or nutrient levels in soils, as well as livestock health. Data can be used "to create prescriptive plans for farmers, build variable rate fertilizer maps, help with water audits, and support produce freshness measurement and tracking," says the Antea Group, an environmental consulting firm. Several ag-tech companies have also developed weed-killing robots that greatly reduce the amounts of herbicides used by farmers.

Technology at the Forefront

Food & beverage manufacturers are eager to use the latest IoT and Industry 4.0 technologies—artificial intelligence and machine learning, robotics, automation, big data—to optimize their business operations and supply chains, identify consumer trends, create safer and healthier and longer-lasting products, reduce environmental impacts, and build brand awareness. New big data applications will expand rapidly throughout the food & beverage and agricultural industries. Reports show there are at least 4,000 early-stage technology companies investing in the food & beverage industry today.

"There is little doubt that the rise of big data and analytics will help food & beverage make more rapid, efficient, and surgical decisions," says Nick Martin, senior consultant and sustainability practice leader for Antea Group. "With more data and better tools, companies can go beyond gut feelings or 'what's been working' to have credible insights that spur informed decisions, meaningful action, and better optimization."

THE NEW FACE OF MANUFACTURING

Blue River Technology

Based in Sunnyvale, CA, Blue River Technology is advancing agricultural automation with its "smart" farm machines that use computer vision and artificial intelligence to identify plants at the individual level.

Once identified, weeds are then sprayed directly with exactly the right amount of herbicide to kill them. This approach requires only 10% of the volume of herbicides that is typically released during broadcast spraying—reducing costs and harm to the environment.

Relying on a vast digital photo library of farm plants, weeds, and advanced optical capabilities, the weed-killing equipment can recognize differences between plants in conditions that would challenge the human eye. A "closed-loop" cycle with a second set of cameras automatically checks the work of the machine as it operates, allowing it to continuously learn and improve.

Blue River Technology was acquired by John Deere in 2017 and remains as an independently run subsidiary. "Computer vision, robotics, and machine learning help smart machines detect, identify, and make management decisions about every single plant in the field," says Jorge Heraud, co-founder and CEO of Blue River Technology. "We continue to advance precision agriculture by moving farm management decisions from the field level to the plant level."

GRAY... WE'RE BUILDING

DIAGEO LEBANON DISTILLERY

LEBANON, KENTUCKY

Diageo is one of the largest spirits producers in the world. The company selected Gray to partner on its new 72,000 s.f. bourbon distillery and dried grain facility in Lebanon, KY. Gray will provide architectural work, building information modeling (BIM), a variety of engineering services, and equipment procurement and installation for the project.

The facility will feature an automated distillery process that includes a granary, mash cooking, fermentation distillation, and barrel filling. The whole stillage from the distillation process is transferred to the dry house process where the stillage is converted to dried grain and sold as an animal feed supplement.

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