

THE ULTIMATE MOVING FEAST: SERIOUS CHALLENGES FACE THE FOOD AND BEVERAGE INDUSTRY

THE BENEFITS OF USING AUTOMATION TO STAY AGILE AND COMPETITIVE
PART I: A CHANGING LANDSCAPE



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INTRODUCTION

The food and beverage industry faces challenges at the best of times. Getting fresh food from farms, to distribution centres, to stores, to consumers, while meeting ever-changing consumer demands makes it one of the trickiest supply chains to manage profitably.

Further complicating this delicate supply chain are factors such as volatile commodity pricing; inventory management that accounts for perishability; traceability, quality and safety; frequent new introductions; high demand uncertainty; complex manufacturing constraints; and environmental impacts of climate change.

And if that wasn't already a challenging enough environment, 2020 has seen Covid-19 have widespread impacts on industries across the globe. For food and beverage, it resulted in more packaged products and stricter handling requirements, reducing manual handling where possible, to minimize the risk of spreading the virus.

Part 1 of this white paper will explore the changing nature of the food and beverage industry, including the impacts of Covid-19. Part 2 will then go on to explore the notion that for such a challenging and constantly evolving landscape, it is essential to be agile, adaptable and futureproof to survive and flourish. Warehouse automation is one technology that can deliver these qualities, plus add ongoing benefits and value such as:

- Efficient inventory management
- Time-phased replenishment planning (efficient, automated and continuous replenishment)
- Optimization of master data in supply chain management
- Planning of sales and operations
- Stock density and personnel safety
- Track and traceability systems, plus meeting consistent and quality packaging requirements



CHANGING NATURE OF THE FOOD AND BEVERAGE INDUSTRY

Volatile commodity pricing

When a consumer buys food at the supermarket, it may seem like the prices are steady week-to-week, because at that level, they generally are. This is because companies have often hedged commodity prices to avoid being susceptible to the typical volatility of the industry. In reality, these prices are fluctuating all the time, which can make it difficult for food and beverage processors and distributors to set price levels.

Prices are also affected by seasonality, which creates peaks and troughs throughout the year. When the seasonality of an item is low (that is, it's not currently "in season"), it presents a difficulty because lower revenues measure up poorly against fixed expenses. High seasonality is challenging too, because companies can struggle to meet demands at the height of a product's season, if they are not equipped for the spike.

In Figure 1, below, the price of various grains, meats and ingredients are plotted from 1985-2015, reflecting how much a single ingredient can change over time. These changes would affect every company that uses that grain as part of their ingredient mix.

Long-term price index in food commodities, 1850-2015, World, 1985 to 2015



Commodity price index in food items dating 1850-2015, measured relative to real prices in 1900 (i.e. 1900 = 100).

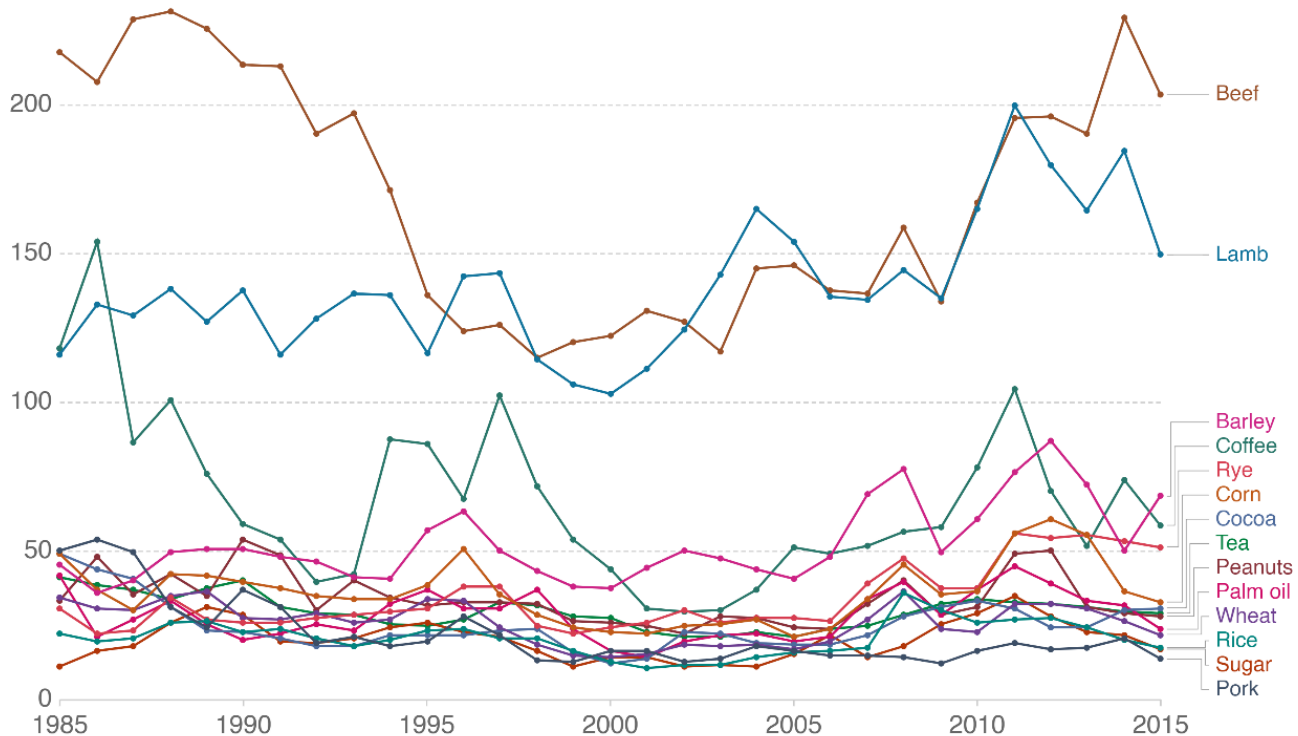


Figure 1: Long-term price index in food commodities, world, 1985-2015. (Source: Our World in Data)

High demand uncertainty

In addition to pricing fluctuations affecting supply, there is also a high degree of uncertainty in demand for food and beverage products. Restaurants, pubs and clubs change menus to meet current trends, and consumers change their buying and eating habits regularly. The food and beverage industry is highly unpredictable in this area, so companies need to be as adaptable as possible.

Inventory management to account for perishability

One of the biggest challenges in the food and beverage industry is the perishability of goods such as fruit, vegetables, meat, poultry, fish and dairy. According to a global study by Deloitte, more than 30% of all food produced is not eaten. As Figure 2, below, shows, it is wasted or lost in production.

Covid-19 has made this problem significantly worse in some areas, because during lockdowns, restaurants, hotels and schools are closed, and therefore not purchasing their usual allocations of food.

With these closures, almost the entire volume of food and beverage sales was redirected to supermarkets. Not only did this see a massive spike in demand for supermarkets, but it created a major shift in consumer behaviour.

In an ABC article from May 2020, a Western Australian food composter said that he'd seen perishable food waste, particularly leafy greens, double in a two-week period. Consumers were panic buying toilet paper and hoarding non-perishables – particularly canned goods – but perishables were not moving off the shelves at nearly the same rate. Instead, they were being left behind, with consumers favoring longer lasting food options.

FOOD LOSS AND WASTE BY REGION

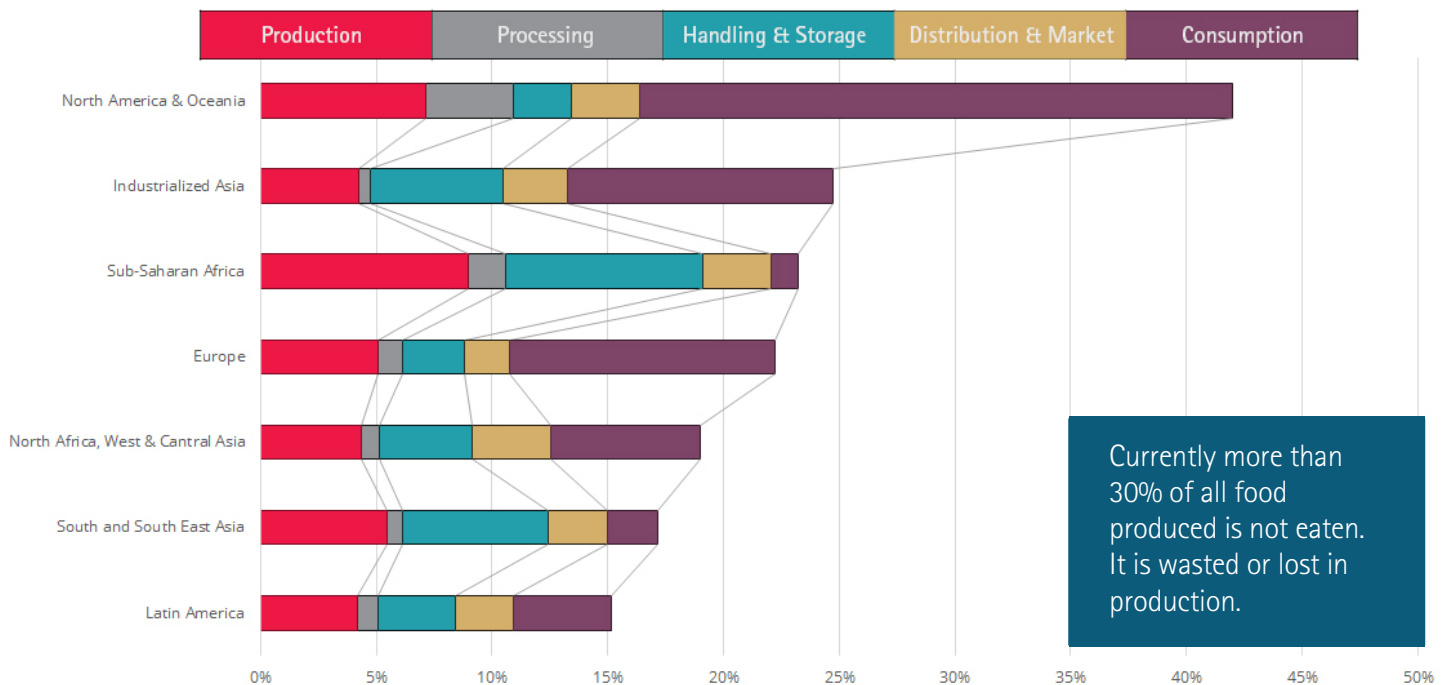


Figure 2: Food lost and waste by region. Source: Deloitte

Traceability, quality, safety

Traceability, quality, and safety are important in most industries, but because the end customer is consuming the product, the food and beverage industry is particularly aware of these qualities.

Research from the Center for Food Integrity found that 65% of consumers want to know more about where their food comes from, and further research from The Consumer Goods Forum and Futerra revealed that 79% of Gen Z, defined as 22 and under, believe brands are never honest, or not honest enough, about environmental issues. That's quite a leap from 23 to 28 years olds, 66% of whom believe the same.

This is an area where automation technologies can provide measurable benefits to companies seeking stronger traceability and credibility. Automated warehouse and distribution systems can be set up to provide end-to-end traceability on all food and beverage products.

Frequent new introductions

Unlike some industries that manufacture the same product profitably and successfully for decades, the nature of the food and beverage industry is to be constantly innovating, evolving and changing, especially with new product introductions.

Warehousing and distribution systems need to be set up to constantly adapt to the introduction of new products, which may have totally different requirements to those currently in production. They might need different storage temperatures, for example, or require a gentler handling process to protect product integrity.

Automation technologies can provide measurable benefits to companies seeking stronger traceability and credibility



Complex manufacturing constraints

High levels of perishability, the delicate nature of products and strict hygiene requirements place complex and demanding constraints on the manufacturing process for the food and beverage sector.

The most significant constraints are:

Time: for perishable goods, large volumes need to be manufactured and processed in short time periods. Batch controlling – which can be automatically managed by – is essential to maintain consistent quality and reproducibility of production.

Temperature: many food and beverage products require specific temperature ranges to be maintained throughout production, transport and storage. For the dairy industry, pasteurization is crucial to maintaining product quality and shelf life. Warm-to-hot temperatures need to be maintained for consistent periods of time for pasteurization to occur correctly. Other products need cold storage environments

to maintain freshness and keep product integrity. In these environments, automated technology can reduce the time people have to spend in sub-zero environments, where there are risks for prolonged exposure.

Process Control: Across the globe, there are strict legal standards for cleaning and hygienic processes, such as a number of regulations established by the European Commission, the Food Safety Modernization Act by the FDA (Food and Drug Administration) in the US, and HACCP (Hazard Analysis Critical Control Point) in Australia and New Zealand and many other countries. In many cases, Covid-19 has made these even stricter than ever.

Automated technology can reduce the time people have to spend in sub-zero environments, where there are risks for prolonged exposure.



Environmental Impacts of climate change

Growers and farmers are facing increasing challenges from unpredictable weather patterns and record temperatures, which can have drastic effects on crop yields, creating a ripple effects throughout the supply chain.

In a paper by Cognizant, "AI, Automation and Appetites: How Technology Will Feed the Future" the author cites some dramatic effects of climate change on production, and shows how automation and AI can be an effective countermeasure to unpredictable changes in climate.

There is a consumer-driven trend towards more environmentally-friendly packaging material in the food and beverage industry. The industry is also conscious of producing food that omits less greenhouse gases and has a lower overall environmental footprint.

Industry 4.0 has allowed food and beverage companies to optimize supply chain management with new tools for better demand planning, supplier management and inventory control.



COVID-19 IMPACTS

Covid-19 has had significant impacts on the food and beverage industry. Consumers have changed where they eat, how they eat and what they eat, as a result of lockdowns and other Covid-related precautions and restrictions.

More packaged products

As awareness of the contagiousness of Covid-19 rose, so did product packaging, in an attempt to shield goods from potential contamination.

Figure 3, below, shows the year-on-year sales growth of packaged foods in the U.S. during the peak of Covid-19.

As consumers braced for potential long periods of isolation in their homes, many hoarded supplies, and there was high demand for packaged foods with a long life.

A similar phenomenon happened across the globe, with toilet paper seeing Australia's biggest spike. A similar phenomenon happened across the globe, with toilet paper seeing the strongest demand in the Asia-Pacific, especially Australia and Japan. In Europe, consumers hoarded pasta, canned food and cleaning supplies as they braced for the potential of extended isolation periods.

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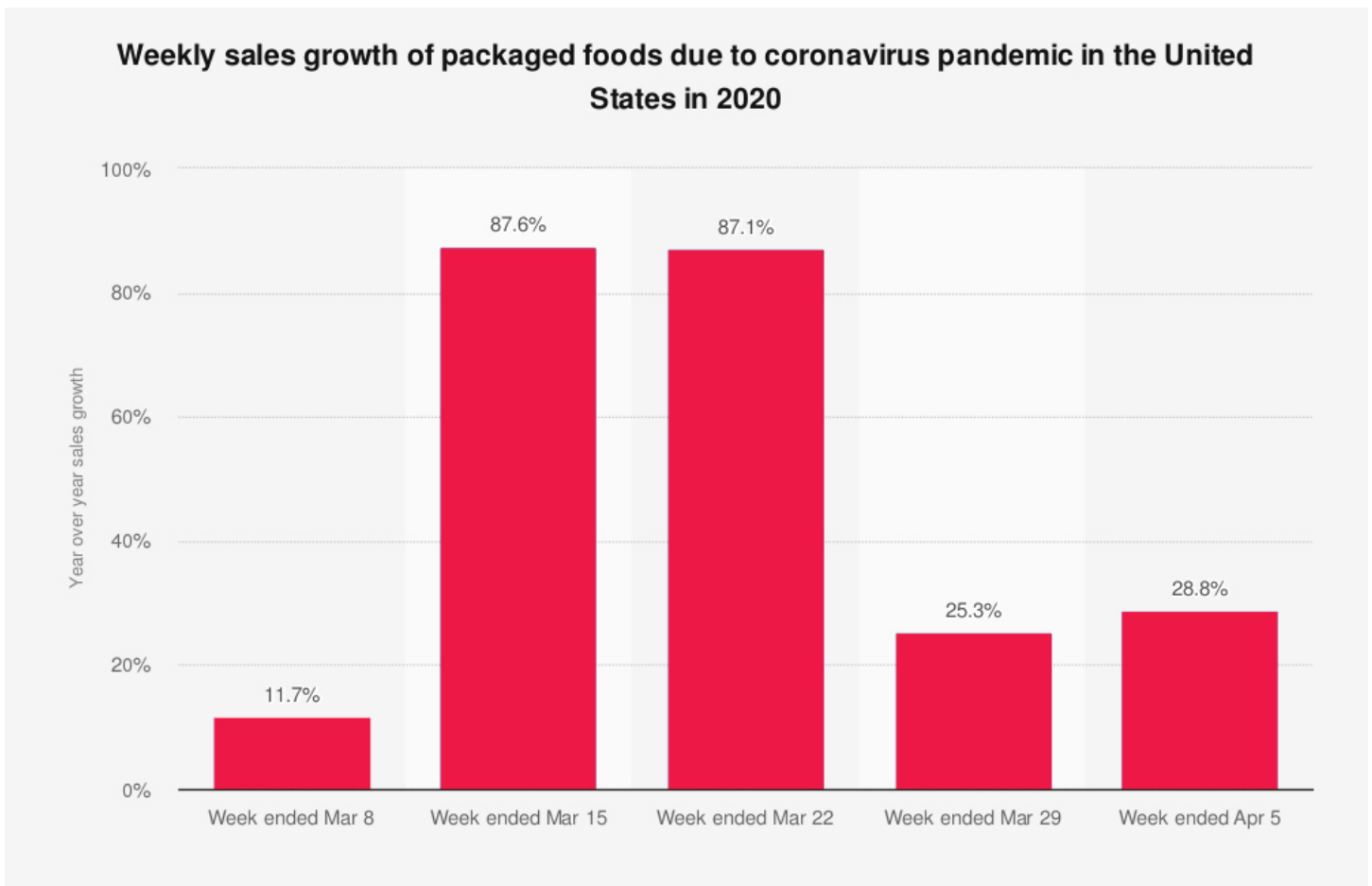


Figure 3: Weekly sales growth of package foods due to coronavirus pandemic in the United States in 2020. Source: Statista

Stricter handling requirements

As companies sought to operate in what Governments liked to call "the new normal," it became apparent that stricter handling requirements would be needed to safeguard consumers against the risk of infection.

To further complicate matters, a study led by U.S. National Institutes of Health found that Covid-19 can remain on plastic and stainless steel for up to three days and cardboard up to one day, which raised concerns regarding packaging as a potential vector for spreading the virus.

Companies that had invested in automation technologies were able to assure their customers that there was minimal manual handling of goods, and therefore a far lesser risk of infection.

This is the first in a two-part series on the changing nature of the food and beverage industry. Part 2 will discuss the benefits of using automation to stay agile and competitive.

CONCLUSION

The food and beverage industry is highly susceptible to outside forces causing changes in supply, demand and choice. It is an industry that must constantly think on its feet in order to remain competitive and profitable.

The challenges identified in this white paper, including new and evolving impacts of Covid-19 on supply chains and delivery systems, are not going away. They may transform in nature, but they will still place the burden on food and beverage companies to constantly adapt.

Part 2 of this white paper series will look at how automation can be harnessed as a tool to optimize adaptability, versatility and output, as well as providing ongoing benefits to safety, productivity and other beneficial outcomes. It will use real-world case studies to showcase the lasting benefits and outstanding ROI that automation can bring to the food and beverage industry.

