

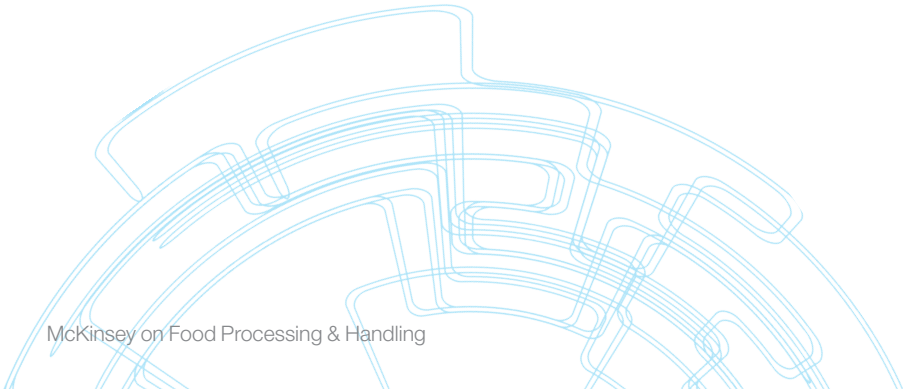
McKinsey on

Food Processing & Handling

Ripe for disruption?

March 2018





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Preface

The food processing and handling (FP&H) sector provides the systems, machinery, and equipment that help the food industry feed a global population approaching eight billion people. It is the behind-the-scenes enabler that quietly and efficiently moves food from field to factory and onto the plate. It is also a significant global industry that has been growing fast in recent years amid rising demand in emerging markets, changes in consumer lifestyles, and a transformative leap forward in technological capabilities.

From the impact of artificial intelligence and process automation to growing demand for organics, the sector is undergoing a period of fundamental change. FP&H equipment companies across the three key sub-sectors of processing, packaging, and commercial food service have a chance to reap significant rewards, but to do so, they must themselves adapt to the changing environment.

Based on an in-depth assessment of the FP&H sector, this report provides an overview of its performance over the last 15 years, the shifting dynamics impacting the outlook going forward, and what is required for companies to capture upcoming opportunities.

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Executive summary

Food processing and handling (FP&H), which consists of three core sub-sectors—processing, packaging and commercial food service equipment—is one of the most important sectors within Industrials. It represents a ~\$100 billion market and has outperformed the broader Industrials segment over the past five years. By any economic or financial metric—top-line growth, economic profit per dollar of revenue, total return to shareholders, or EBITA margins—our analysis shows FP&H equipment sector leading the Industrials group.

What is driving this success? Can the sector continue its over-performance? What is the next growth S-curve for this sub-sector? The following sections—through a combination of financial analysis, executive surveys and interviews, and industry research—will attempt to answer these questions.

Our extensive financial analysis shows that four key factors have driven FP&H's exceptional performance: EBITA margin expansion from 5.5 percent in 2002-07 to 10.2 percent in 2011-16; efficient use of capital, with 2.7x capital turns in 2011-16 compared with 2x capital turns for industrials; a return to growth after the financial crisis, evidenced by 4.3 percent CAGR revenue growth 2011-16 versus 0.6 percent for wider industrials; and a return to 2006-2008 highs in M&A activity.

Amid demographic change, innovation, and evolving customer needs, the outlook for the sector is positive, and growth is expected to accelerate in the years ahead (5 percent CAGR from 2016-21, compared with 4 percent from 2011-16). Emerging market population growth (coupled with urbanization and rising living standards) will drive rising demand (Asia is expected to account for 50 percent of growth through 2021), backed by a dietary shift to higher-value-added products. Changing consumer preferences will continue to boost organic and healthier food markets, and food safety regulation will lead to product/menu expansion, higher standards, and a more intense focus on traceability. Increased appetite for convenience food will catalyze innovation in packaging, and operational challenges and cost pressures (including rising labor costs) among equipment users are set to accelerate automation.

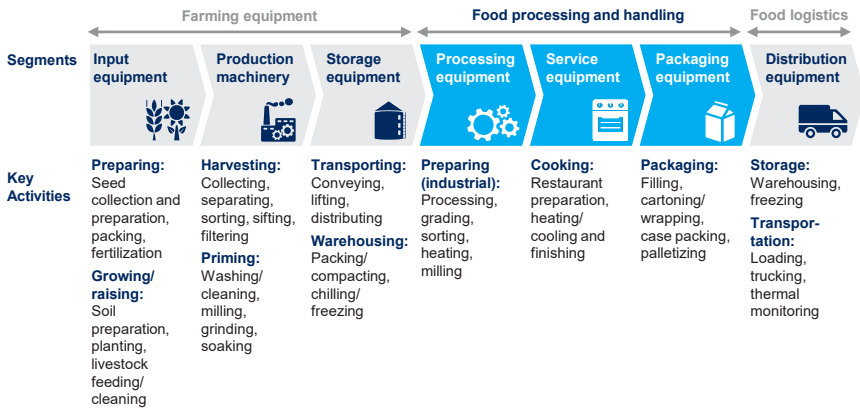
Through exhaustive interviews and surveys, combined with our analysis of the sector's outlook, it seems likely that this sector will continue its growth trajectory. Despite the momentum, our analysis also highlights some critical fault-lines that need to be addressed. The winners within this sector realize that the traditional playbook is becoming outdated, and that to capture growth and deliver breakthrough performance they will need to embrace new ways of working. They are investing in new capabilities (advanced data and analytics, robotics, and automation), new offerings (smarter products and full solutions built around them), and new operating models (including enhanced after-sales and growth-focused strategies). The sector overall, however, is ill-prepared for change; less than one-quarter of executives feel that they have made significant progress in developing a playbook fit for the future.

As companies within the sector embrace these opportunities, they must be prepared to take a structured approach aligned around three key principles: where to play, how to play, and when to play. The right combination, along with suitable enablers, will create a recipe for the sector's sustained success in the years ahead.

Introduction

The food processing and handling (FP&H) sector provides the equipment and solutions to produce, process, and distribute food to billions of households around the globe, and it services a multi-faceted value chain from farming to logistics (Exhibit 1). The sector has become increasingly important as the world's population has grown and dietary preferences have evolved, reflecting higher incomes and a shift to value-added products. This in turn has boosted demand for equipment and solutions to process, store, package, and cook food.

Exhibit 1: The FP&H sector consists of three core sub-sectors (food processing, service, and packaging) within the broader value chain



SOURCE: MOFPL Techsci Research, McKinsey

The sector is an approximately \$100 billion market (exhibit 2) and is comprised of three core sub-sectors: processing (\$45 billion), service equipment (\$37 billion), and packaging (\$16 billion).

Exhibit 2: FP&H equipment is an approximately \$100bn market



Each sub-sector contributes significantly to the wider economy, covers distinct customer segments, has a varied mix of customer concentration, and consists of varying player archetypes.

Food Processing

In 2016, food processing was a ~\$45 billion market when measured by revenues. This sub-sector comprises machinery for activities that include processing, grading, sorting, heating, and milling. The top-ten players in this sub-sector account for approximately 20 percent of the market.

Food processing machinery is generally grouped by end-product (e.g., meat, dairy, bakery).

Food Service Equipment

Commercial food service equipment—which comprises restaurant preparation, heating/cooling, and finishing equipment—was a ~\$37 billion market in 2016. The top-ten players account for approximately 25 percent of the sub-sector.

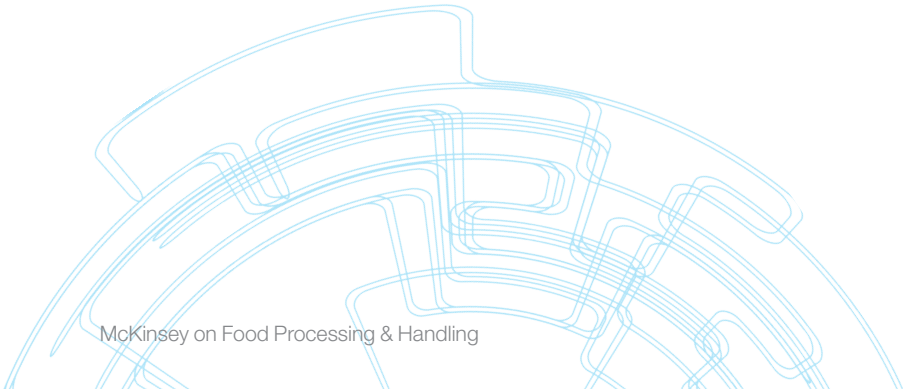
Food service equipment is largely categorized by the end-market use of the machinery. Some players only make one category of equipment, like refrigeration equipment or ovens, while larger players tend to be diversified.

Food Packaging

In 2016, food packaging was a ~\$16 billion market comprising equipment machinery (e.g., preparing, combining, aligning) and packaging machinery (filling, cartoning/wrapping, case-packing, palletizing). The top-ten players account for approximately 40 percent of the market.

As with food processing, the end-market is an important consideration when grouping food packaging equipment types. Packaging players tend to operate in one or more “packing steps”; some may be a primary packager, while others play a role at the end of the production line. This differentiation will categorize the types of machinery a packaging player makes. Packaging is also characterized by the materials used.







Leveraging digital and analytics: An interview with the CFO of Panera Bread

Over the past 35 years, Panera has grown from one 400-square-foot cookie store into an enterprise with more than 2,000 bakery-cafés, 100,000 associates, and annual sales of more than \$5 billion. We asked CFO Mike Bufano to share some thoughts on how Panera has achieved such success and plans to sustain it in the notoriously difficult restaurant industry.

How does Panera approach the growth imperative?

We make a lot of bets. Not all of them work out, but the ones that do make a real difference for the customer. And we believe in our ability to iterate and refine those bets as we go.

How does Panera think about growing organically versus inorganically?

Historically, Panera hasn't been very M&A-driven, but four months after JAB Holding Co. took the company private in July 2017, we announced plans to buy Au Bon Pain. I think ABP will be a good deal for us because their best real estate complements us very well—universities, transportation centers, and hospitals. That's how we think about M&A. The right M&A makes strategic sense for the company.

But we can't rely solely on inorganic growth. The long-term success of Panera has rested on the ability to generate organic growth through initiatives that resonate with customers and boost same-store sales. As CFO, I don't want us to fall in love with M&A. We have to stay focused on the growth that will come from doing the right organic things and doing them well.

What are some of the most important organic growth bets that Panera has made over the last decade?

Just in the time that I've been here, we've seen a huge shift to digital in every part of restaurant retail operations, and we made some early bets on that trend. We had the confidence to act because we can think like our customers. For the most part, people who work at Panera also eat at Panera.

Tell us about one of your early bets.

One of the first things I worked on when I came to Panera was the launch of My Panera, a new loyalty program that we tested in Washington, DC, and then rolled out nationally in 2010. So many more people signed up than we had anticipated that we worried we were giving away too many discounts. Today we have 30 million people in the program. It handles over half of Panera's transactions and is the largest loyalty program in the industry.

My Panera has turned out to be a great gift to Panera. We've collected so much data on customer behavior that we can see important patterns we can use to shape other winning bets. For example, we have started doing real one-to-one marketing. We know which customers love the strawberry poppy seed salad so we can let them know when their favorites are about to disappear and when they will return. We know which customers land in Boston on an unseasonably warm day so we can alert them to a nearby Panera and urge them to drop in for a smoothie.

We've also developed Café Health, a customer satisfaction survey linked to the My Panera program. Customers who opt in get an email after every few visits asking them to take a quick survey. It's short—just eight or ten questions that measure the warmth of the customer experience; the accuracy, speed, and cleanliness of the café; perception of price/value; and so on, and it uses a simple one-to-five scale.

We've found the survey very powerful, because it's not too much information but the most important information. General managers of cafés review the data and comments with their associates to find ways to improve customer satisfaction. For example, the data might say that warmth is an issue, and customers might comment that cashiers don't greet them. The GM can remind associates to say, "Good morning" or "Good afternoon" and "How are you today?"

Does all that make Panera an analytics-driven company?

Yes, but not to the point of decision paralysis. We like to gather as much information as we can and understand it as well as we can. But sometimes we'll do something because we believe it's the right thing to do.

We also recognize the importance of asking the right questions to ensure that we work with the right cuts of data (since the possibilities are almost infinite). For example, when we started testing delivery, we realized that its start-up economics are not attractive. You pay drivers just to stand around; you haven't built up volume; you have to pay for gas and mileage. But if you can analyze data to prove that delivery creates incremental volume, then you can live with the early economics. Our analysis made us confident that delivery was a new occasion for many people or a way to serve our customers when they couldn't get out of the office or home to visit a café.

Similarly, when we consider opening a new café, we can compare the sales potential of cafés with and without delivery and catering and analyze the area or density of office space required to make delivery profitable.

What other early bets have paid off handsomely for Panera?

When I started here, zero percent of our sales were digital. By the end of 2017, digital accounted for 30 percent of the sales in our company-owned cafés.

In 2010, we started testing kiosks for in-store ordering—not to offset labor costs (wage pressure didn't hit hard until 2013-2014) but to improve the customer experience, especially by shortening the long lines at lunch. We thought about how the airlines had introduced kiosks to help us decide how to get Panera customers comfortable with using them.

What is Panera betting on today?

Today, we're taking a page from Uber's book. An approaching delivery driver sends a message promising arrival in two minutes. This is especially beneficial for lunchtime deliveries to office buildings. The driver doesn't have to sit there instead of making another delivery or going back to the café to pick up another order. The two-minute warning gets the customer down in the lobby for a quick handoff.

As Panera has embraced technology, have you had any surprises?

One of the places technology surprised us was engaging with the workforce.

We had never changed our employment application process. Ron [Shaich, Panera's founder and chairman] pushed us to rethink that process. A couple of years ago, his 16-year-old son had to complete an online application so he could work at Panera for the summer. Together, he and Ron needed an hour to do it. The next morning Ron said, "Guys, this is crazy. No 16-year-old kid is going to take an hour to do this stuff. Their attention span is just too short, and he can't even do it on his phone. If he could've done it on his phone while he sat there and watched TV or did whatever, he would've done it."

Ron was right. Now you can apply to work at Panera on your phone. We were probably a little bit behind where we needed to be on that, but we've caught up.

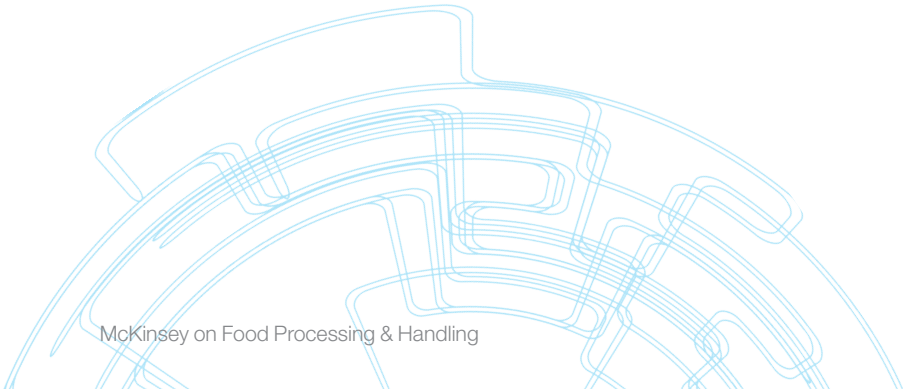
So how technology will evolve and how we will use it with our employees is an interesting question. From a training perspective, will augmented and virtual reality mean that you can put on a pair of goggles and learn to make a salad or a sandwich? Probably.

As you look forward, what threats might interrupt Panera's strong growth trajectory?

I certainly worry about wage growth. Panera has always paid above minimum wage and always will. It's really important to us that our people are paid well. But I worry about a ripple effect across the restaurant industry if we suddenly have a \$15 minimum wage. Everybody would raise their prices, and customers might decide to eat less in restaurants and eat more at home.

Now that we're 30 percent digital, I worry about cybersecurity. Cybersecurity is like food safety. You do everything you can to plan for it, you do everything you can to be ready so that, if something does happen, you deal with it quickly, but it's scary. Fortunately, we have a phenomenal technology team.







Food processing and handling performance and outlook

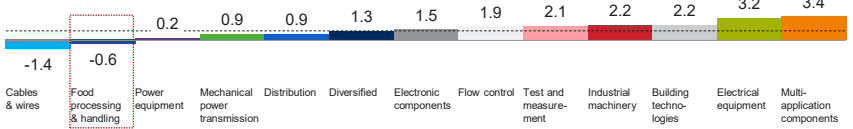
Historical performance

In the past five years, the FP&H equipment sector has generated 2.6 percentage points of average annual economic profit (EP/R), compared with 1.5 percentage points in the wider industrials group. This performance marks a turnaround from the 2002 to 2010 period, when the sector largely trailed Industrials overall.

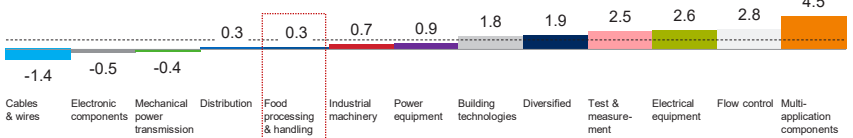
Of the 13 sectors that make up the Industrials group, FP&H is showing a remarkable resurgence. While it was the second-worst performing on an EP/R basis (EP/R of -0.6 percent) during the 2002 to 2007 period, in the past five years its 2.6 percent EP/R catapulted the sector to fifth—a jump of seven spots in the ranking, the biggest improvement in relative performance (Exhibit 3).

Exhibit 3: The FP&H equipment sector has jumped to fifth among industrials in EP/R terms

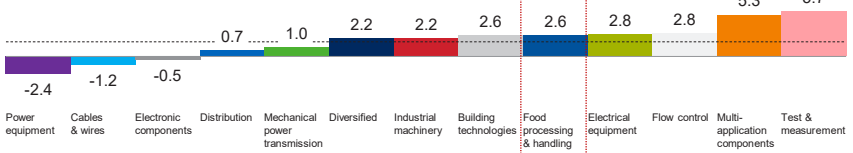
2002-2007



2008-2010

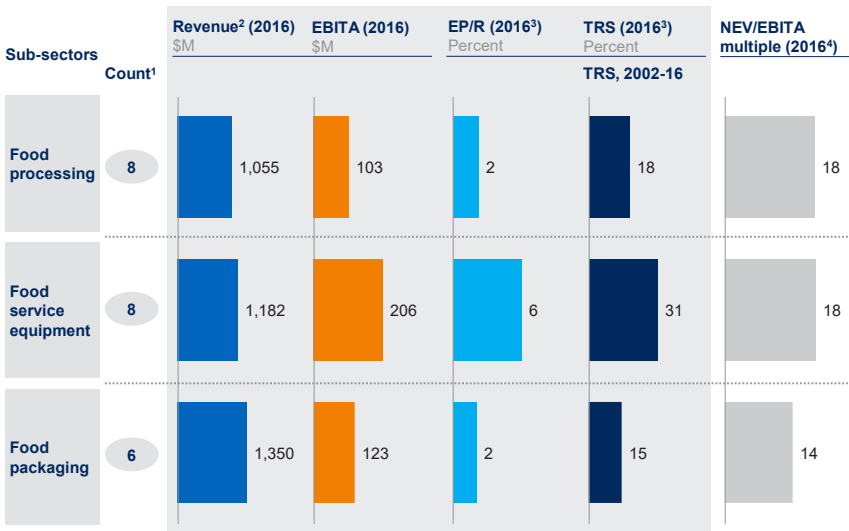


2011-2016



FP&H equipment matched the EP/R of the broader Industrials group in 2011 at 1.6 percentage points and reached 3.5 percentage points by 2016 (Exhibits 4 and 5).¹ The sector produced economic profit per dollar of revenue that was 1.1 percentage points higher than the wider industrials group over the period—double the total return to shareholders and 0.7 percent higher EBITA margins.

Exhibit 4: Twenty FP&H equipment companies were reviewed across three segments

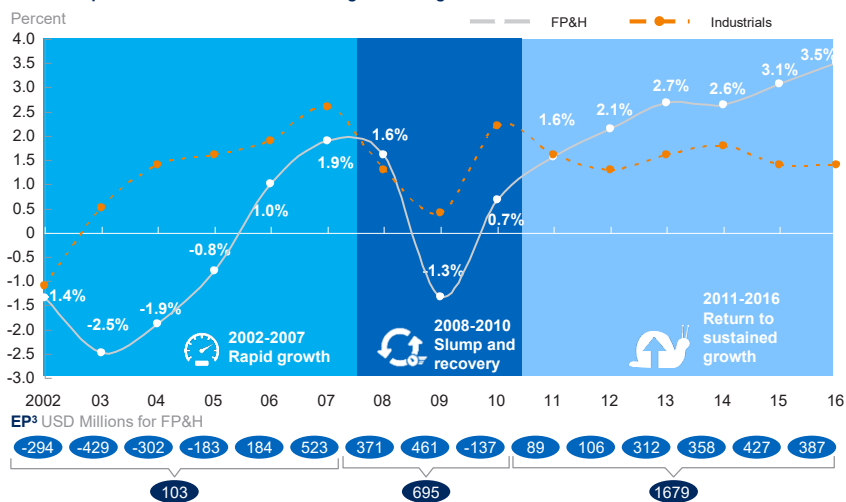


- 1 Companies with more than \$100M in revenue in 2016
- 2 Total 2016 revenue of the companies addressed in analysis
- 3 Weighted by revenue
- 4 Weighted by Adj. EBITA

1 Our analysis of the FP&H equipment sector is based on a universe of 20 listed companies, each with >\$100M in revenue in 2016, and which collectively generated \$24 billion of revenues in 2016.

Exhibit 5: FP&H equipment has outperformed (EP/R) industrials in the past five years

Economic profit/revenue for Food Processing & Handling¹ and Overall Industrials²



1 20 companies in FP&H Equipment with revenue > \$100 million.

2 384 companies in Industrials with revenue > \$1 billion.

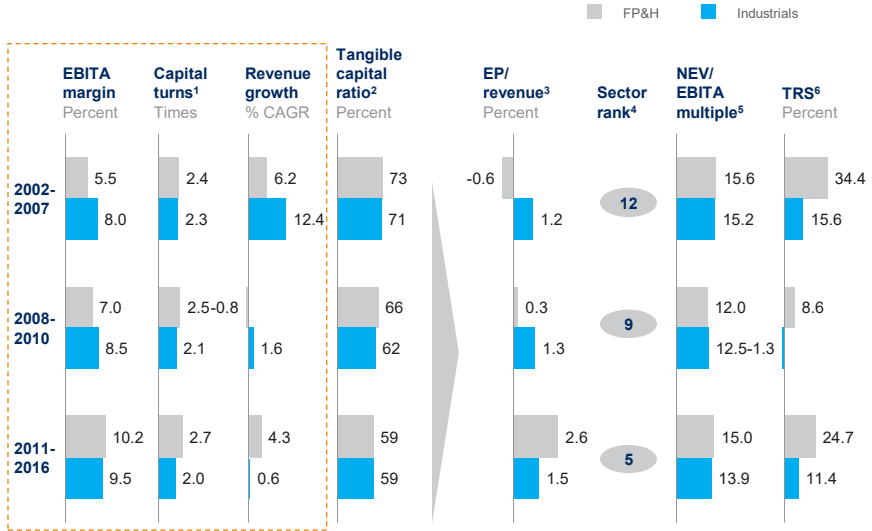
3 Total economic profit generated by 20 companies in FP&H equipment, excluding companies with insufficient data to calculate EP at a given year.

The performance improvements can be attributed to four key factors (Exhibits 6-7):

- Margin expansion: 470-basis-point improvement in EBITA margin (from 5.5 percent in 2002-07 to 10.2 percent in 2011-16).
- More efficient use of capital: 2.7x capital turns from 2011-16 compared with 2.0x among Industrials.
- Return to revenue growth after the financial crisis: 4.3 percent revenue growth (CAGR) compared with 0.6 percent among wider Industrials.
- Resurgence of M&A: 12 transactions on average per year over the past three years, in line with 2006-2008 levels.

The ability to generate significant profit improvements during recent economic upcycles is reflected in shareholder returns — FP&H TRS over 2011-2016 was 24.7 percent—higher than the industrials average of 11.4 percent (Exhibit 6).

Exhibit 6: FP&H equipment has improved margins, capital turns and revenue growth vs industrials in the past five years



1 Revenue/average invested capital excluding goodwill over two years.

2 Tangible capital ratio defined as operating invested capital/invested capital. Lower ratio typically indicates higher amount of goodwill.

3 Revenue weighted EP/R for 20 \$100MM+ FP&H equipment companies.

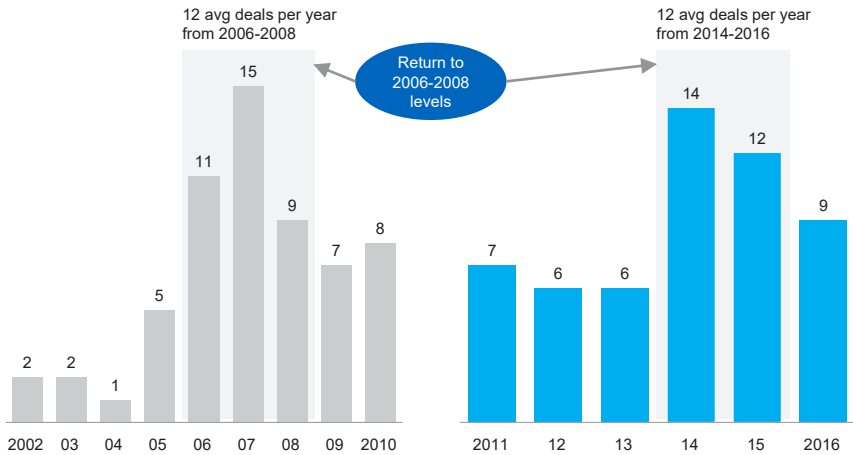
4 Ranked out of 13 Industrials sectors for FP&H equipment companies that have \$100MM+ revenue.

5 Net enterprise value (NEV)/net operating profit less adjusted taxes (NOPLAT) multiple.

6 Weighted average total return to shareholders (TRS) by market capitalization for the time period.

Exhibit 7: The number of M&A deals has returned to 2006–2008 levels in the past three years

Number of deals per year in FP&H¹



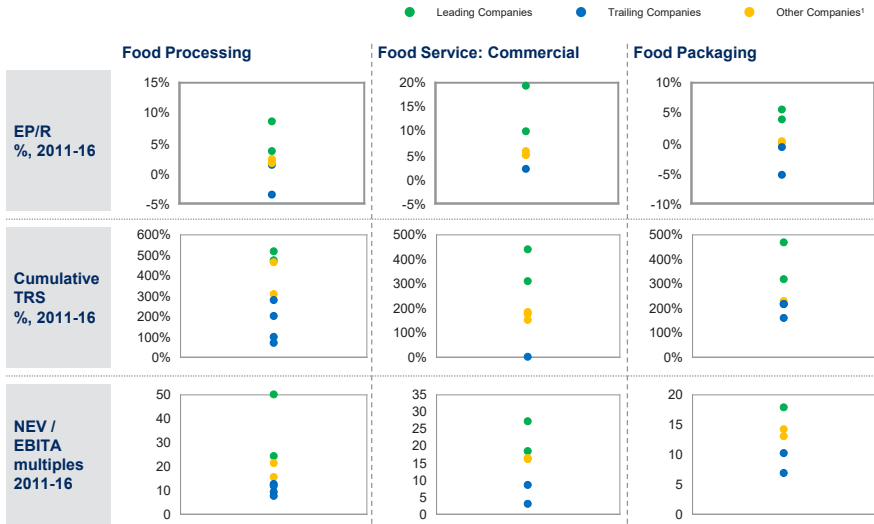
¹ Represents the M&A activity of 10 \$1Bn+ revenue companies

SOURCE: S&P Capital IQ

Variation at company level

Individual companies in each segment have varied widely in performance (shareholder return, EP/R, and valuation multiples (Exhibit 8)). The average EP/R range for each segment was around 10 percent, but certain product segments had more variability than others, partially due to the impact of out-performers. For example, in the commercial food service segment, one company had an EP/R between 2011 and 2016 of nearly 20 percent, while another's was just 2 percent. In food processing, TRS for the best-performing company was around 500 percent, while at the other end of the spectrum it was around 68 percent.

Exhibit 8: Corporate performance varied significantly within sub-sectors

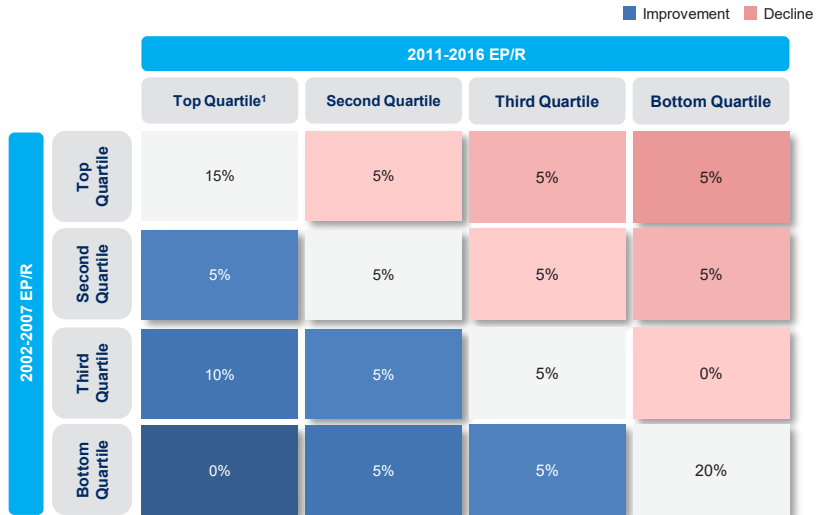


1 Company ranking is defined by relative performance among product segments in 2011-16: Leading companies are those with top quartile performance; Trailing companies are those with bottom quartile performance; Other companies include the rest of the players in the segment.

Consistently out-performing peers within the sector has not been straightforward, highlighting the need for continued innovation. Fifty-five percent, or 11 out of 20 companies, saw either improvement or decline in their EP/R compared with peers between the 2002-07 and 2011-16 periods (Exhibit 9).

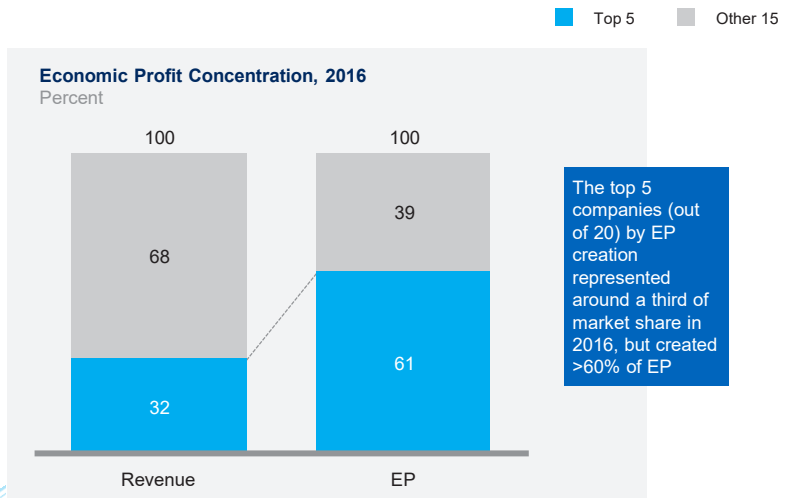
The disparity in performance can also be seen in respect to economic profit creation. In 2016, some 25 percent of companies generated around 60 percent of economic profit, despite having a 32 percent market share (Exhibit 10). Put another way, the top quartile of companies created 4.5x as much EP per company as the average of the rest.

Exhibit 9: 55% of companies saw either improvement or decline in their EP/R compared with peers between the 2002-07 and 2011-16 periods



¹ FP&H equipment overall quartile distributions determined by taking the sum of the individual distributions for each product segment (e.g. packaging)

Exhibit 10: The top five companies created >60% of economic profit



SOURCE: S&P Capital IQ

Future Outlook

As we look to the future, four powerful trends will create tailwinds for the sector: 1) growth in emerging markets (alongside urbanization and rising living standards), 2) changing consumer preferences, 3) increased demand for convenience food, and 4) operational challenges and cost pressures among equipment customers. These combined will likely expand the total addressable market for equipment and the opportunity for more specialized products and services. Subsequently, the next few years will likely see continued growth in the FP&H equipment sector's performance as growth accelerates to around 5 percent (CAGR) compared with 4 percent from 2011 to 2016 (Exhibit 11).

- **Emerging market growth, urbanization, and rising living standards**

Steady growth in emerging markets, urbanization, and rising living standards are causing a dietary shift to higher-value-added product, fueling demand for processed and packaged food and leading to higher equipment sales. Emerging markets are driving most of this growth, with Asia expected to contribute about half of global growth between 2017 and 2021.

- **Changing consumer preferences**

An increasing focus on health (organic and healthier food) is driving product/menu expansion and the need for higher standards and traceability. There will likely be a new range of equipment for food production, requirements for higher machine standards, and a need for specialized systems (e.g., RFID labelling) to ensure traceability and minimize spoilage.

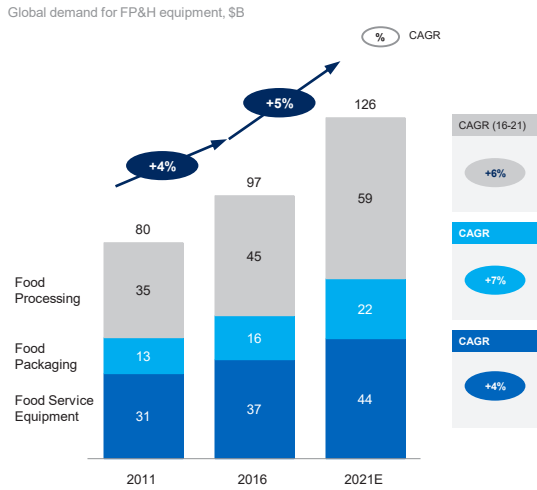
- **Increased demand for convenience food**

Increased demand for convenient “on-the-go” food presents a growth opportunity for the food service sub-sector—particularly in emerging markets—and is driving innovation in flexible packaging.

- **Operational challenges and cost pressures**

Customers are demanding machines that improve operational efficiency, cut costs, and increase uptimes, leading to new requirements for automation, energy efficiency, and integrated solutions (including predictive maintenance).

Exhibit 11: Outlook for FP&H equipment is positive as growth is expected to accelerate

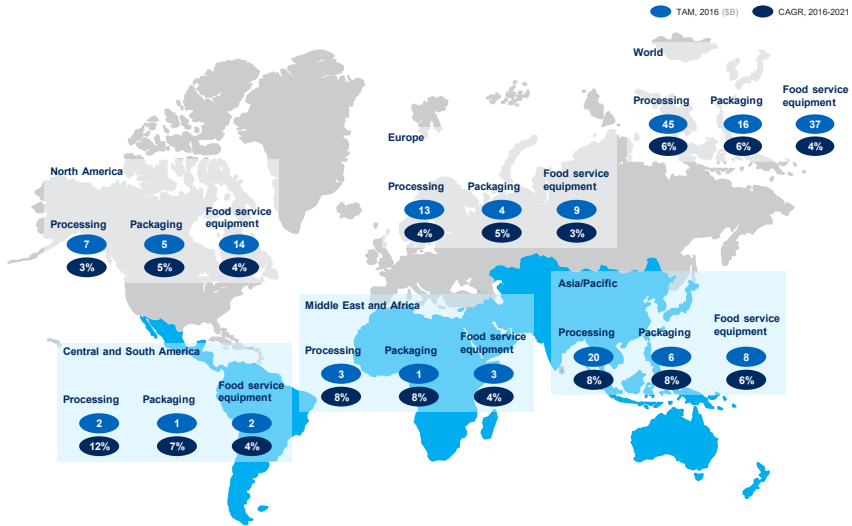


SOURCE: Freedonia, BCC, Azoth

Emerging market growth, urbanization, and rising living standards

Steady growth in emerging markets, urbanization, and rising living standards are fueling demand for processed and packaged food, leading to higher equipment sales. Emerging markets are leading the way—particularly in Asia, which currently accounts for ~35% of the ~\$100 billion FP&H equipment market and is expected to account for 50 percent of growth by 2021 (Exhibit 12).

Exhibit 12: Emerging markets are driving the growth, with Asia representing the largest opportunity



SOURCE: Freedonia, Azoth, BCC Research, McKinsey Analysis

Rising populations, urbanization, and increasing wealth are driving most of the growth in emerging markets as these factors prompt a dietary shift to higher-value-added products. For example, China’s working age population is likely to expand by 20 percent by 2030—an additional 100 million people—and per-capita consumption is set to more than double.²

People in emerging markets are not just changing how they eat; they are changing what they eat. With more disposable income, consumers are shifting to higher-value-added foods (meat, dairy, chocolate). Higher-value-added foods often require specialized machinery for processing, packaging, and serving, and growth in the segment is almost three times faster than convenience foods and four times faster than health foods. Globally, food processing is expected to grow by 6 percent up to 2021, while processing of higher-value-added foods in emerging markets is predicted to grow by 9 percent.³

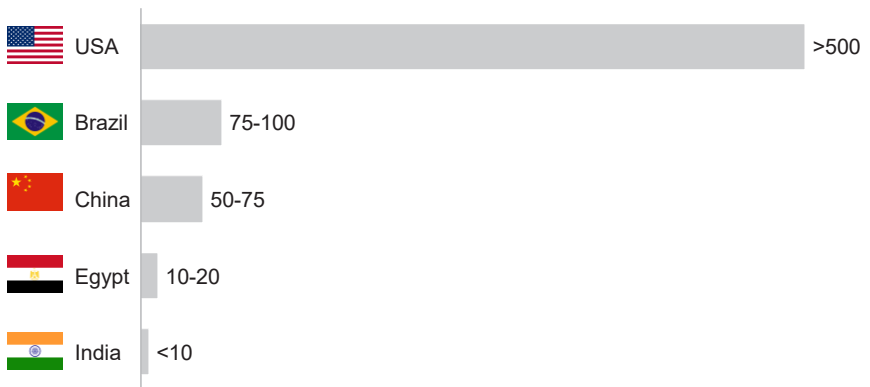
2 Urban world: The global consumers to watch, McKinsey & Co, 2016

3 “Global Food Processing Machinery by Type and Region, 4th Edition,” Freedonia Group, September 2017

Under-penetration of restaurant chains offers significant opportunities in emerging markets. For every million people in the U.S., there are more than 500 chain restaurants (Exhibit 13), but in Brazil there are 75-100, China there are fewer 50, and in India there are fewer than ten⁴. As restaurant chains expand in emerging markets, the food service equipment segment should benefit.

Exhibit 13: Under-penetration of chain restaurants in emerging markets presents a growth opportunity for food service equipment companies

Penetration of chains¹, # chain restaurants per 1M (2017)



SOURCE: Euromonitor

1 Full Service & Fast Food Chains

Changing consumer preferences

The \$745 billion global-health-and-wellness beverage and packaged food market is expected to grow by 3 percent annually between 2016 and 2022 to \$851 billion.⁵ Global organic food sales have grown by 7 percent a year between 2010 and 2016, from \$59 billion to \$186 billion⁶, supported by a proliferation of eco- and nature labels (Exhibit 14).

The “premiumization, health, wellness, natural, and organic” category is driving the majority of developed-market machinery growth and some emerging-market machinery growth. This trend does not necessarily affect the type of food that goes through a processing plant, but it does impact systems

4 Euromonitor

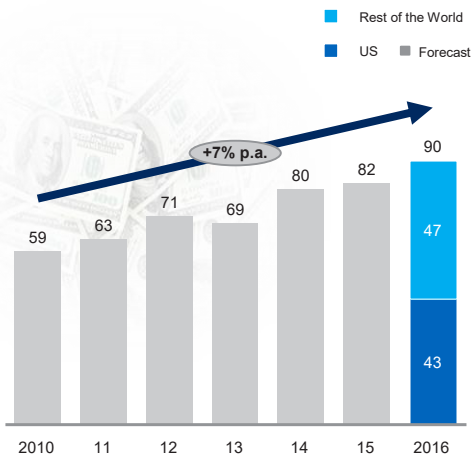
5 Euromonitor

6 Statista, Organic Monitor, Organic Trade Association (USA)

and quality control. Traceability is becoming a big concern for consumers—leading to opportunities for manufacturers—and FP&H equipment machines increasingly incorporate “smarts” to collect and analyze data.

Exhibit 14: Global trend toward healthier, higher quality foods, with organic products growing seven percent p.a. over past six years

Global organic food sales
\$B



Example of organic and bio food labels



SOURCE: Statista, Organic Monitor, Organic Trade Association (USA)

Demand for organic food is growing fast, and the segment already has a high penetration in Europe and North America. In the U.S., the organic segment grew from 3 percent to 5 percent of food sales between 2006 and 2015. Currently, the highest organic market share globally is in Denmark, where it accounts for 8.4 percent of total sales. Switzerland has the highest per-capita spending, with more than \$280 per person per year spent on organic food. Food companies have started reformulating products to meet organic standards. Factors driving rising demand for organic include increasing government support for organic agriculture, expansion of organic products beyond the natural channel, and the increasing popularity of organic foods in restaurants. The continued, intensifying appetite for organic foods will lead to a need for more specialized machinery—to ensure accurate labelling, for example.

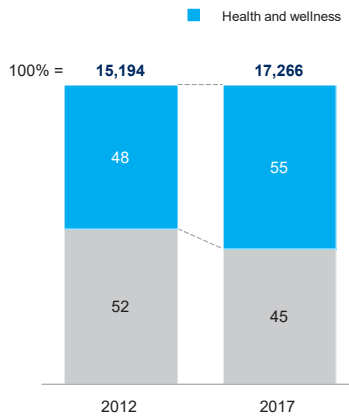
The health shift is not limited to organic options. Artificial flavors and GMOs are under pressure, with customers responding to products that are GMO-free and naturally flavored. Many large food companies are jumping on the trend by reformulating products to replace artificial flavors and colors and adopting GMO labeling.

Health and wellness offerings increasingly comprise the majority of leading companies' product portfolios. Expanding these “better-for-you” product portfolios often requires specialized machinery and packaging (Exhibit 15).

Exhibit 15: Expanding better-for-you (BFY) product portfolios require specialized machinery

Leading manufacturers are expanding health/wellness offerings

Share of total new food product introductions North America, in %



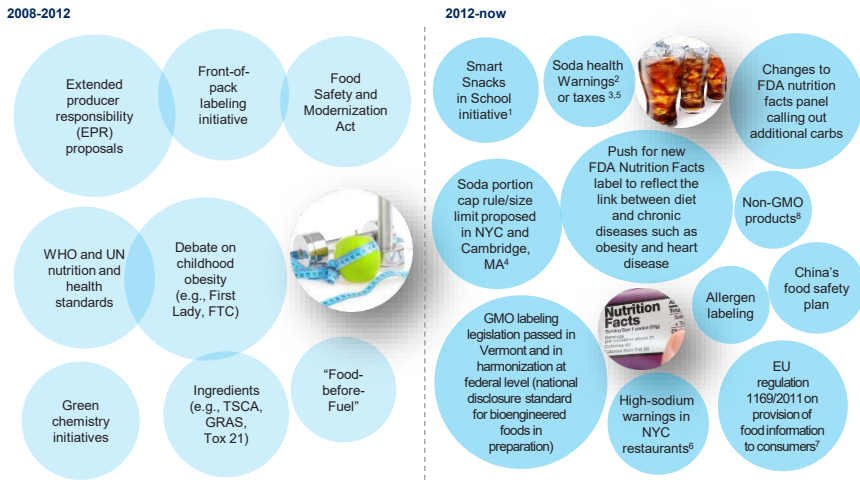
SOURCE: Mintels GNPD new product database

Consumer requirements for better traceability—arising mainly from animal welfare concerns—have spurred changes in ways of working in the meat-processing sub-sector. Processors are required to be able to isolate batches of meat, for example, where there is contamination. Traceability demands are also linked to government regulations that require companies to meet rising standards of healthiness and food safety (Exhibit 16).

These push-and-pull factors have led to a demand for technologies such as sensors and robotic equipment for processing and packaging. A significant market expansion in the coming years is unlikely, largely because the U.S. does not yet offer full traceability (with the poultry industry still lagging),

and there are disputes over who should pay for the technology. But other developing markets—particularly China, where a number of food safety scares have occurred—will likely continue to grow rapidly.

Exhibit 16: Government intervention in food safety and health has increased



- 1 Introduced in 2014, limiting fat, calorie, sugar, and salt in foods served at participating schools
- 2 Introduced in 2015, required on advertisements; bans on soda advertisements on publicly owned property
- 3 First city-level tax on regular CSDs and energy drinks
- 4 Proposed in 2012, rejected in NYC in 2014; 5 Introduced in 2014. California passed America's first soda tax focused on health in 2014
- 5 Municipalities passed taxes in 2016
- 6 Introduced in 2015
- 7 Making, e.g., nutrition information voluntary from Dec 2014 and mandatory from Dec 2016
- 8 Dannon pledge

One example technology for traceability used in packaging is RFID tags. RFID technology can be used to track a product through the factory, creating an audit trail of its path. More advanced tags can monitor temperature, humidity, pressure, and motion. The data can be used to meet legal tracking standards and to assure customers of product quality. RFID tags provide more data than traditional methods like manual tracking or barcodes, while also requiring fewer resources, such as labor.

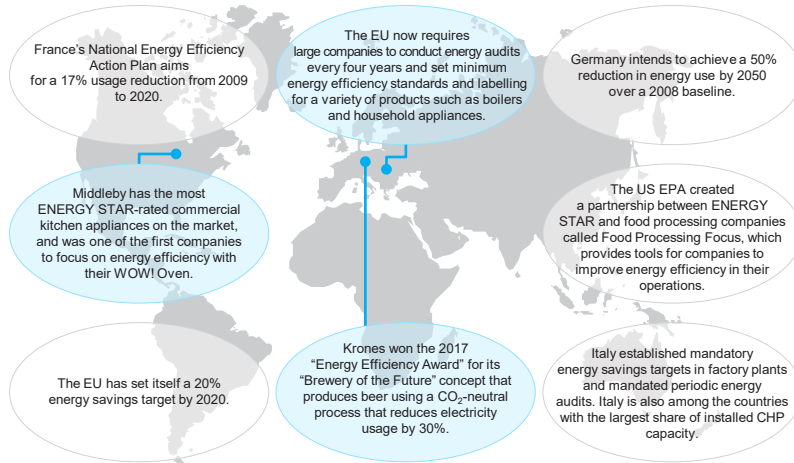
In addition to healthier food, customers are increasingly concerned that their food suits their needs, from gluten-free to organic and kosher. Machinery and systems are required to facilitate and signpost these standards.

Equipment manufacturers will be required to help track/trace food throughout the value chain, with automation continuing to drive improvements in food safety. Sensing and measurement technology will improve food-testing for safety, and the increased use of robotized processing and packaging will reduce human contact with food—thereby reducing the likelihood of contamination.

Government regulations are driving energy efficiency requirements in the food industry (Exhibit 17). Consumers are also increasingly aware of and concerned about companies' ethical performance, including environmental awareness and energy usage. Companies recognize this and are taking action, with several large food companies setting specific greenhouse gas reduction targets. Once such company has reduced absolute emissions by greater than ten percent through investment in energy efficiency and clean energy innovation, and plans to invest \$100 million in energy efficiency and clean energy over the next ten years. Another large food company is requiring its suppliers to reduce carbon emissions and aiming to have the majority of their suppliers provide annual reports on progress.

Exhibit 17: Governments and companies prioritize energy efficiency

Energy regulation, targets and achievements



SOURCE: Dexmatech, WWF, company press releases

Increased demand for convenience food

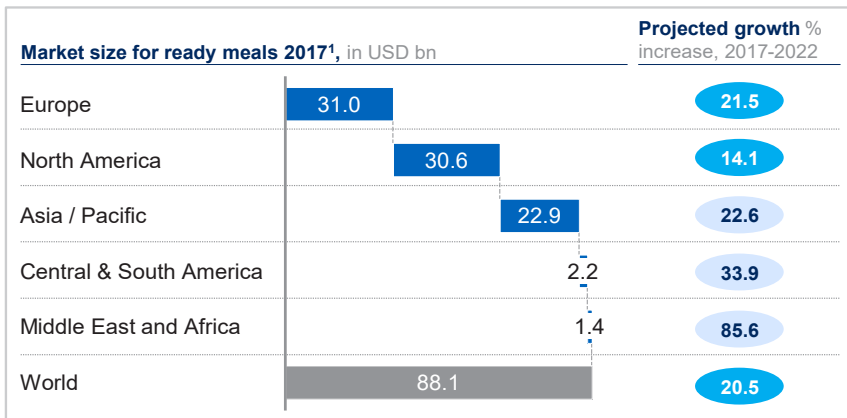
Both developed and emerging market populations are increasingly mobile and amenable to food options that fit urban lifestyles. The "on-the-go" trend is especially pronounced among Millennials, who in the U.S. spend 46 percent of their food dollars (\$2,915 annually) on eating out. By contrast, Baby Boomers spend 41 percent of their food dollars (\$2,914 annually) on eating out.⁷

Quick-serve restaurants have achieved impressive growth by expanding menus and focusing on convenience and price, despite a general slowdown in the restaurant industry. Leading quick serve companies are focused on menu innovation, store renovations, digital ordering, and delivery. Quick-serve restaurants are also driving innovation in the equipment space, with digital solutions and self-serve kiosks taking off, allowing customers to customize their orders. Panera has embraced web, mobile, kiosk and e-commerce ordering as part of its "Panera 2.0" initiative, with almost half of stores offering these features. These changes will drive innovation among equipment

⁷ US Bureau of Labor Statistics, US Food Institute

manufacturers, with machines connecting to cooking equipment to provide real-time updates and synchronization.

Exhibit 18: “Ready meals” are experiencing healthy global growth rates and emerging markets are growing more quickly from a smaller base”



¹ Retail value RSP

SOURCE: Euromonitor

“On-the-go” convenience food is also growing outside of restaurants. Urban, dual-income households are opting for easy food options to fit their lifestyles. The global meal replacement market is expected to grow by 7 percent a year from 2016 to 2020 (from \$9 billion to \$12 billion).⁸ The breakfast replacement market is the most impressive example—consumers are increasingly opting for snack bars, breakfast buns, and instant oatmeal pouches.

“Ready meals” are seeing healthy global growth rates, and emerging markets are expanding most quickly (but from a smaller base). The Middle East and Africa will likely see fast growth in the coming years to 2022.⁹ Unlike the general FP&H equipment market—in which Asia holds the largest market share—Europe and North America still dominate ready meals (each with \$31 billion of the \$90 billion global market).

New forms of convenience are driving innovation in the packaging market, leading to a wider range of products and styles. The expanding ready-meal

⁸ Meal Replacement Market to see 7.1% CAGR, Worth \$12B by 2020, Marketwatch, May 6 2016

⁹ Source: Euromonitor, McKinsey expert interviews

market, for example, is boosting demand for trays (e.g., CPET and PP plastics trays that allow direct cooking/warming) while flexible packaging is replacing traditional formats such as glass jars and metal cans, supported by a recent wave of innovation in materials. Pouches, particularly stand-up pouches, are the fastest-growing product category, with companies such as AptarGroup offering new spouted, child-friendly versions. Global flexible packaging sales to consumers are expected to grow by 4 percent a year between 2017 and 2022 (from \$229 billion to \$283 billion), with emerging economies set to grow at twice the rate of developed markets.¹⁰

Operational challenges and cost pressures

Equipment purchasers are demanding ever-lower prices, which is driving innovation and improvements in functionality. In the food-service space, quick-serve restaurants are facing cost pressure driven by footprint, labor, and energy. Demand for automation is also rising, due to the relatively high cost of labor, tightening immigration policy in the U.S., and low labor retention rates in industrial settings. Food plants are often located in rural areas, and work-conditions can be challenging; staff turnover can be as high as 70 percent. Even in low-cost countries, the demand for automation is rising, often driven by a desire for more reliability.

Falling robot prices are another factor driving automation. Companies are increasingly demanding end-to-end solutions that integrate production with product management systems and leverage data to drive performance. Machinery is becoming more robust and is able to resist stresses such as the caustic washdowns required in some environments. Technological advances, including robots that can collaborate with humans, are driving a proliferation of FP&H equipment use cases—for example, where cutting is human-guided, but the heavy work is carried out by machine.

As robots become more advanced—integrating motion and logic and eliminating hardware and physical connections—they make a smaller and efficient footprint. They have also become more user-friendly; they can carry embedded video interfaces, for example.

¹⁰ The Future of Flexible Packaging to 2022, Smithers Pira, March 2017

Advances in automation are leading to more use cases where sourcing labor is difficult. For example, many primary meat processing facilities struggle to attract and retain staff, with businesses required to pay more and, in some cases, provision against compensation for repetitive stress injuries. Automation using X-ray technology to reduce waste has allowed some plants to cut labor costs by as much as 70 percent and to become more efficient—inspecting packages at a rate of 180 a minute, for example. The result is more productive and valuable processing lines, but at increased capital costs, with machines tending to become obsolete more quickly as the pace of innovation accelerates. Companies can offset these costs somewhat by leveraging the data and accuracy provided by machines to offer more after-market services.

Still, where machines are used, downtime is often a major operational concern. Quick, efficient maintenance is key. Across all industries:

- 98 percent of organizations say a single hour of downtime costs over \$100,000.
- 81 percent say an hour of downtime costs over \$300,000.
- 33 percent say an hour of downtime costs \$1 million to \$5 million.¹¹

The cost of equipment downtime is especially pronounced in FP&H equipment because of increased potential of rapid spoilage.

Proactive equipment maintenance programs have been shown to significantly lower costs, with some manufacturers seeing savings as high as 80 percent. There are three specific strategies:

1. Run-to-failure. Running machines until they fail makes sense if the cost of maintenance is high relative to machine cost.

2. Preventative maintenance. Inspection, diagnostics, service, and parts replacement are scheduled. This strategy does not cater well to machines that fail before or after the scheduled maintenance window.

¹¹ How Much Does One Hour of Downtime Cost the Average Business?, RAND Group, January 2017

3. Predictive maintenance. Sensors and performance management software identify maintenance issues before problems occur. This strategy is most effective when equipment downtime is particularly costly.

FP&H equipment companies are increasingly turning to predictive maintenance, and predictive features are being worked into aftermarket support plans, with manufacturers tracking the machine through its lifespan.

Companies are naturally focused on equipment that helps increase efficiencies. The average food processing plant is more than two decades old, meaning that many manufacturers now need to invest in capital equipment. Across FP&H equipment, there is a growing incentive to invest in machinery that can deliver savings.

Increasingly food processors, packagers, and restaurants expect FP&H equipment companies to develop cost-saving solutions. It is now common practice for a FP&H equipment company to have a “test kitchen” R&D space. For example, Buhler Group operates a Bakery Innovation Center that is responsible for product development services and training, with a focus on flour. Essentially, Buhler offers “R&D-as-a-service” to its customers.

Other companies market their system integration solutions to improve factory efficiency. For example, Marel offers “Innova,” a software solution for system integration and production optimization. Innova maximizes value and minimizes waste by collecting data throughout the production process to monitor traceability, throughput, and efficiency.

FP&H equipment manufacturers have focused on mechanical machine performance in recent years, suggesting the potential for more software solutions that leverage data and streamline oversight and processes. There is room for further investment in R&D and innovation to continue to develop equipment that caters to customer pain points—which include improving yield and reducing labor costs (optimizing for total cost of ownership). Customers will increasingly demand full-service offerings that can be integrated into production management systems and that leverage data and analytics to drive performance improvements.

Implications for FP&H equipment companies

The four tailwinds will have a number of specific implications for equipment manufacturers.

Rapid growth in emerging markets will lead to accelerating demand for higher-value-added foods that cater to local tastes and needs—requiring specialized machinery for processing, packaging and service equipment.

Food manufacturers will continue to rely on food processing and packaging equipment companies to drive innovation for changing tastes and “on-the-go” convenience requirements—e.g., CPET and PP plastics trays allowing direct cooking/warming of meals. Additionally, the increase in appetite for organic foods will lead to a rising demand for specialized machinery (with increased traceability functionality, for example).

An increased focus on food safety and regulation means companies will be required to help track/trace food throughout the value chain, with automation continuing to drive improvements in food safety. There will be increasing requirements for sensing and measurement technology for food safety testing, as well as robotized processing and packaging to reduce human contact and contamination.

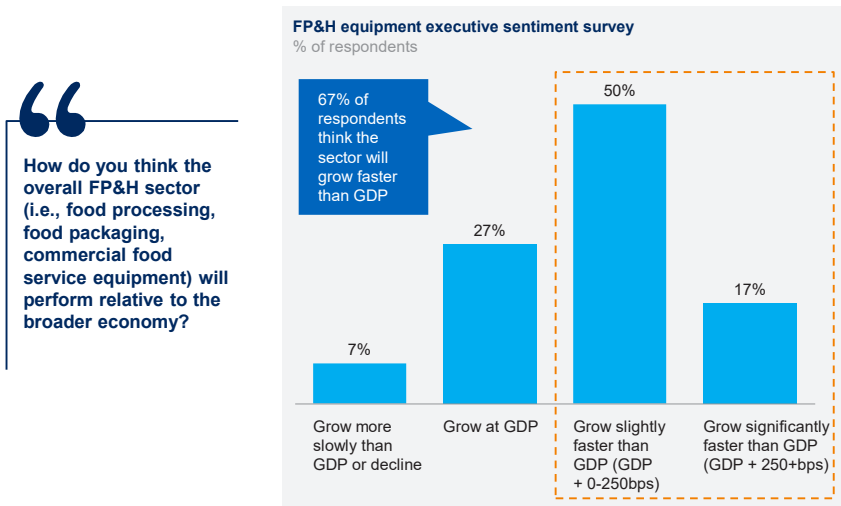
Finally, customers will increasingly rely on equipment manufacturers to provide technologically driven operational efficiencies to improve yields, minimize energy and footprint requirements, and/or reduce labor costs through automation. They will demand more full-solution offerings that are integrated into production management systems and that leverage data to drive performance improvements.

Enablers of Success

New enablers of success in FP&H equipment

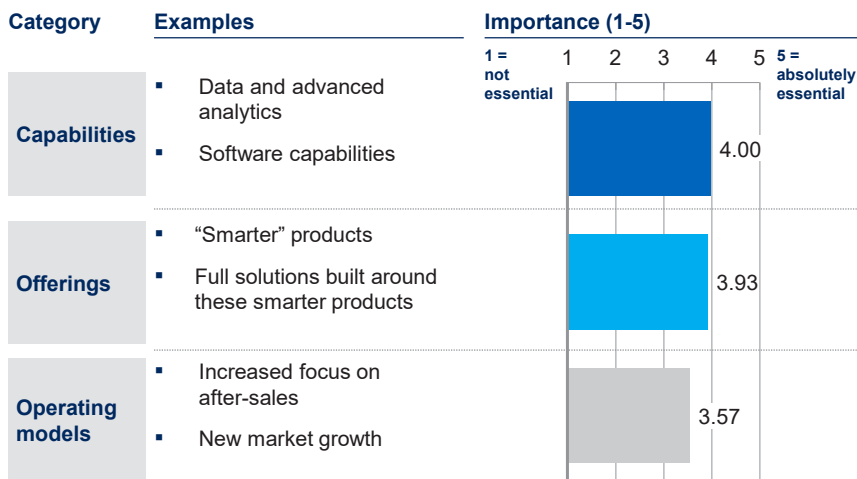
Executives in the FP&H equipment sector are optimistic about the future, and 65 percent think the sector will grow faster than GDP, according to the McKinsey FP&H Equipment Executive Sentiment survey (Exhibit 19).

Exhibit 19: Executives in the sector have a bullish view, with two thirds saying the sector will grow faster than GDP



However, FP&H equipment executives know that they need to operate differently to capitalize on sector tailwinds. More than 90 percent believe that they will need new capabilities (advanced data and analytics, robotics, and automation), new offerings (smarter products and full solutions built around them) and new operating models that include enhanced after-sales and growth-focused strategies.

Exhibit 20: To capture growth and to deliver breakthrough performance, many executives believe they will need new enablers



SOURCE: McKinsey FP&H Equipment Executive Survey

New capabilities

To adapt to technological advances and a changing environment, companies must develop the right capabilities to compete. For example, companies must develop the tools and skill sets to capture, store, and analyze increasing amounts of data so that they can leverage advanced analytics to make better informed business decisions.

Example enabler of new capabilities: advanced analytics

Sensors, systems, and visual capture generate vast amounts of data that, when combined with advanced analytics, can become a powerful key to unlocking new products, services, and markets in the years ahead.

Analytics can add value across the business, from revenue management (determining which markets to invest in) to deciding how to compete (identifying the right products, channels, and offerings). To bridge the gap between analysis and execution, the ability to integrate analytics into key business processes will be paramount to improve decision making. In parallel, companies will need to invest in data and analytics architecture and tools that enable that integration. This investment includes distributed storage, and computing and data-visualization tools that are plugged into existing workflow

tools and provide actionable insights. Close monitoring of the data lake and its data quality is critical. There are seven areas where data analytics capabilities can have significant impact to “move the needle” (Exhibit 21).

Exhibit 21: There are seven areas where analytics can have significant impact

Areas where analytics can “move the needle”	
<p>A. Revenue management</p> <ol style="list-style-type: none"> 1. Where to compete <ul style="list-style-type: none"> – Which micro-markets? – Which customers? 2. How to compete <ul style="list-style-type: none"> – Which products to sell? – How to increase sales conversion? – How to increase share of wallet? – Which channels to leverage? – How to tailor offering? – How to value price? <p>B. R&D</p> <ol style="list-style-type: none"> 3. Where to target R&D investments <ul style="list-style-type: none"> – Which sponsored projects? – Which products? – Which attributes? 	<p>C. Operations</p> <ol style="list-style-type: none"> 4. How to optimize time to market 5. How to optimize manufacturing costs 6. How to optimize supply chain <ul style="list-style-type: none"> – How much CapEx? – How to improve supply chain efficiency? – How to reduce cycle time? <p>D. Other</p> <ol style="list-style-type: none"> 7. How to Improve talent management <ul style="list-style-type: none"> – How to reduce top employee attrition? – How to improve the screening and recruiting process?

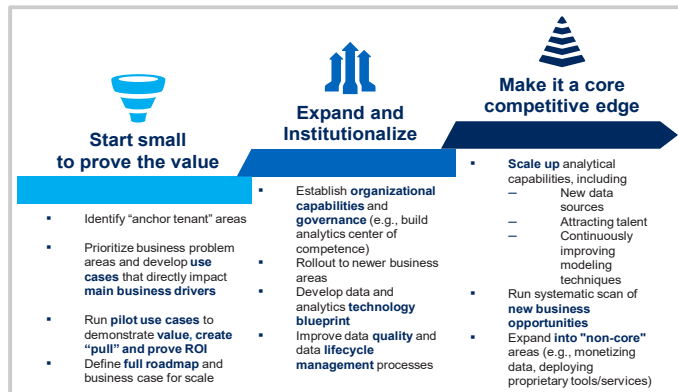
Analytics and research should be aligned with operations so that companies can become agile decision-makers and nimble responders to changing market conditions. In operations, analytics can help optimize costs and time-to-market, create efficiencies in the supply chain, and monitor and support talent management.

One area of potential is plant and equipment maintenance, where sensors and analytical tools can help to increase productivity by as much as 30 percent, including a 50 percent decline in machinery breakdowns, a 20 percent reduction in spare part inventory, and a halving of total downtime. As an example of analytics applications in action, Welbilt has leveraged software to power its “kitchen connect” remote monitoring solution, offering comprehensive in-field support and functions to streamline operations such as menu management, alerts, and maintenance. These analytics offer insights into operating models and equipment, from refrigeration to lighting and ventilation. Marel Innova, meanwhile, uses analytics to provide full production control for food processing plants, monitoring activities through the value chain and including dashboards to give executives a picture of KPIs such as device and process performance, weighting and labeling, logistics, and traceability.

To build analytics capability companies should start small to prove the value of their investment and prioritize business problems to demonstrate how their analytics capability can support their main business drivers (Exhibit 22). By first running pilot use cases to create pull and proving the return on investment, companies can subsequently create a well-founded business case to scale and a blueprint for an end-to-end roadmap.

Companies should seek to hardwire their analytics capabilities so that they can modularize expansion as the business moves forward. This way, they can add capabilities as a natural element of new products and services and continuously work to improve data harvesting and applications. Over

Exhibit 22: Typically, companies start small and build advanced analytics capabilities step by step



time, data and analytics can become a key strategic asset, offering FP&H equipment companies new business propositions and a sharp cutting edge.

Leveraging the power of advanced analytics

By 2020, some 20 to 30 billion devices are expected to be connected through the Internet of Things.¹² This explosion of devices will lead to an unprecedented amount of data; to illustrate, approximately 90 percent of all data available today is estimated to have been generated in the past two years, and the amount of data is expected to triple every two years from now on.

The increasing availability of data is leading more companies to leverage advanced analytics to generate insights and learn how to run their businesses more effectively. Industrial companies, and the FP&H equipment sector in particular, however, have lagged in adopting and implementing analytics at scale. Based on the McKinsey FP&H Equipment survey, 80 percent of FP&H equipment executives say that while advanced analytics is one of their companies' top four opportunities going forward, they also rate their progress in adoption and implementation at two out of five, on average.¹³

FP&H equipment companies need to implement the necessary cultural, organizational, and technical changes to embed analytics in the DNA of their organization. It starts with a clear roadmap of prioritized use cases that can quantify the value to be unlocked.

A FP&H equipment company, for example, can choose to improve its machines' reliability by optimizing design and using machine learning to predict and explain patterns in engineering improvement. Managers can integrate production site optimization tools to reduce loss and delays in the process. A large, diversified industrials player followed this playbook and drove \$500+ million in savings for its manufacturing and R&D functions by using advanced analytics to quickly identify opportunities and inefficiencies across sites. Advanced analytics can also be used during the sales process to help companies micro-segment their installed base, tailor their pricing, and develop strategy to avoid margin slippage. For example, a conglomerate with a long-tail of business through the distribution channel was able to tailor prices by customer and product segment and subsequently increased return on sales by 5 percent. The

12 Bauer, H., "Six ways CEOs can promote cybersecurity in the IoT age", August 2017.

13 2017 FP&H Equipment Executive Survey.

company also improved failure modeling and implemented predictive maintenance to reduce machine downtime and maximize yield.

Leveraging data and advanced analytics can transform a company—but it takes work to implement effectively. Fundamental changes are required to embed analytics into an organization. Effective analytics organizations focus on building six core capabilities: analytics strategy, data transformation, modeling techniques and tools, operating model, talent and organization, and analytics and value assurance. To be successful, analytics should not be seen as a separate function but instead must work in harmony with the rest of the business. It requires investments of time and money—and a considerable cultural shift. But the pay-off can be huge. More importantly, companies that do not embrace advanced analytics risk being left behind.

New operating models

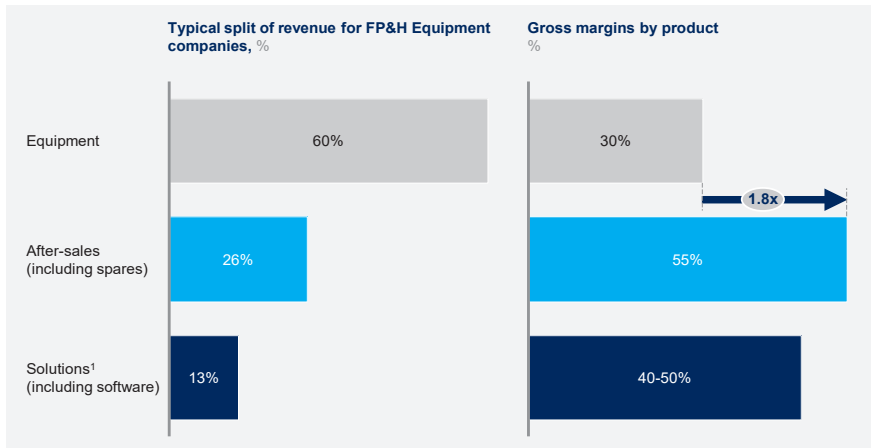
As companies migrate from a product to a service focus, they must take the necessary steps to renew their operating models to align with re-imagined businesses. As part of this effort, they should incorporate agile planning strategies that reflect an era of accelerating technology-driven disruption.

Looking to the future, two examples of these activities are 1) developing innovative after-sales service models and 2) aligning with new market growth.

Example enabler of new operating models: after-sales

After sales make up a significant and highly profitable segment of FP&H equipment companies revenue. After-sales typically account for ~25% of a company's revenue, but typically have 2x higher gross margins (Exhibit 23). This, coupled with the reoccurring nature of after sales revenue means getting after-sales right can lead to a meaningful uptick in profitability.

Exhibit 23: After-sales has a significant impact on segment profitability



¹ Other accounts for 1%

SOURCE: McKinsey FP&H Equipment Executive Survey

Companies seeking to increase their focus on after-sales may, as a first step, develop tools to map and monitor aftermarket lifetime value. This effort should include creating a detailed schematic of the installed base and establishing and measuring KPIs (such as the attach rate for a particular product) supported by enhanced back-office capabilities. By highlighting average annual penetration per customer against target annual penetration, for example, the schematic can show where the company is under-penetrated or not achieving its “fair share” of revenues. This strategy should be accompanied by careful planning (and monitoring) and a strict focus on execution and growth.

Getting after-sales right

Getting after-sales business right is critical because it provides more recurring revenues and higher margins than standard equipment sales.

In a recent McKinsey survey of FP&H equipment, one FP&H equipment executive noted¹⁴, “There is very little profit at the bottom line for equipment—if any, considering sales and administration expenses. The

profitability is really determined by how well you run your after-sales business.”

After-sales solutions fall into two broad categories: digital advanced services, such as increased automation; and traditional or core after-sales services such as maintenance, repair, and spare parts. Within both categories, OEMs are facing more competition from digitally native after-sales service e-commerce platforms, local third-party service providers, and even customers developing their own in-house solutions. They can offer highly specialized tools that can at times out-compete traditional OEMs on price or quality of service and parts. The increased importance of after-sales services coupled with higher levels of complexity make it imperative for managers at FP&H equipment OEMs to identify the best opportunities.

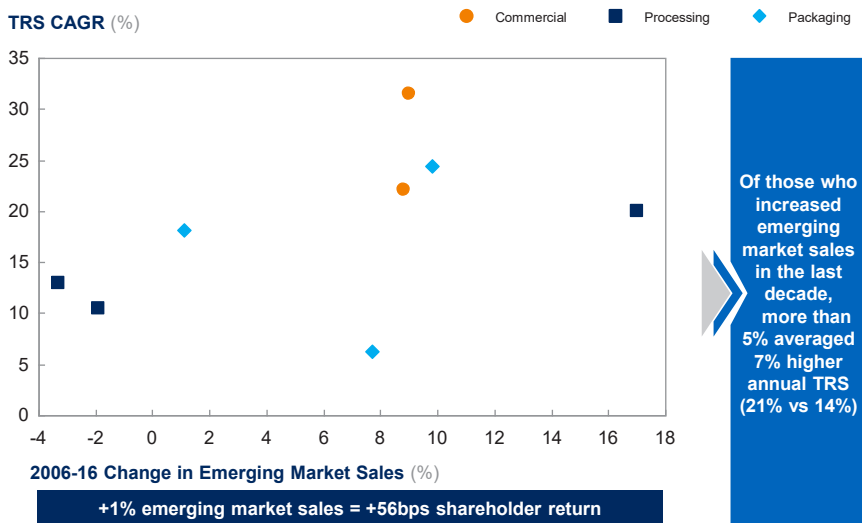
As outlined in *Industrial aftermarket services: growing the core*¹⁵, to better compete, executives must undertake a detailed examination of each product line’s after-sales lifetime value (the total sales from their installed base). This metric is typically product line-specific and provides a more comprehensive view of after-sales value than commonly used metrics, such as service sales per customer. After-sales lifetime value is calculated by multiplying product lifetime (years), lifetime penetration (percent), and average-annual services revenue (dollars). This evaluation helps executives understand the service revenue generation of each product and allows them to benchmark their performance against peers. For example, a food processing company may have two main products, a honey ham slicer and a peppercorn turkey slicer. The peppercorn turkey is far more corrosive to machines (lower product lifetime), but the OEM may be the only provider with the expertise to service the machines (higher penetration), and the machines must be serviced more often (higher annual services revenue), so it may be a more important product line to focus on. Given the number of competitors looking to take services share across different avenues, food handlers that concentrate their efforts on the solutions that drive the most value will avoid the pitfall of being too widely spread.

¹⁵ *Industrial aftermarket services: growing the core* (Kervazo, Forsgren, Lavandier, Brotschi, Ambadipudi, Xing)

To succeed in improving after-sales presence using after-sales lifetime value, executives must establish and measure key performance indicators for after-sales service (e.g., attach rate across lines, annual service revenue by product group). Once the company understands its installed base by product line, it can plan to take actions, including optimizing spare parts pricing, increasing marketing efforts on servicing late-cycle equipment, and restructuring the network of technicians. While each company's strategy must be tailored to its situation, companies that have applied the correct levers have doubled their after-sales lifetime value in three to five years. Finally, companies must rely on excellent execution to implement changes, monitor impact, and achieve growth.

Example enabler of new operating models: new market growth
 Geographic expansion is a compelling possibility for the FP&H equipment sector. Over the past ten years, FP&H equipment companies that have increased their emerging market presence have returned 7 percent more shareholder value than those that have not (Exhibit 24). Companies will require defined growth and go-to-market strategies to target new markets, whether through partnerships, M&A, or organic growth.

Exhibit 24: Companies that have expanded in EM have created 7% more shareholder value over 10 years

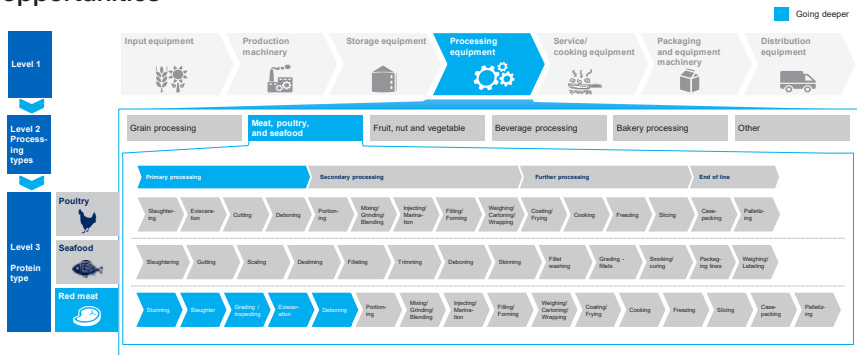


1 Asia, Latin America, Middle East, and Africa. Companies were excluded due to incomplete data.

SOURCE: CPAT Data, McKinsey Analysis.

The FP&H equipment space is complex, consisting of many niche areas or micro-markets, each of which has its own unique characteristics and players. Developing a detailed understanding of the value chain and different steps in the chain is important to identifying areas for growth. For example, the food processing equipment market can be broken down into processing steps (primary, secondary, end-of-line) and protein types—each with niche and integrated players in the space (Exhibit 25).

Exhibit 25: Companies must understand value chain steps to identify opportunities



New offerings

Advances in technology are creating opportunities to expand beyond hardware and offer smarter solutions that drive significant value. As smarter products offer differentiation and margin opportunities, companies can extend their ambition toward more innovative, “up-the-stack,” and customized products and services that fully leverage the capabilities of today’s technology.

Examples include:

- **Embedded sensors and connected devices** using cellular or Wi-Fi connectivity to transmit and analyze data in real time, collecting data and providing remote access to facilities.
- **Cloud-enabled products** with software solutions created, deployed, and operated on cloud-based platforms, offering continuous data acquisition via platform-as-a-service for developing, deploying, operating, and monetizing industrial internet applications.
- **Embedded software-enabled products** representing the full suite of solutions that can be used to glean insights, increase efficiencies, and enable new products and services.

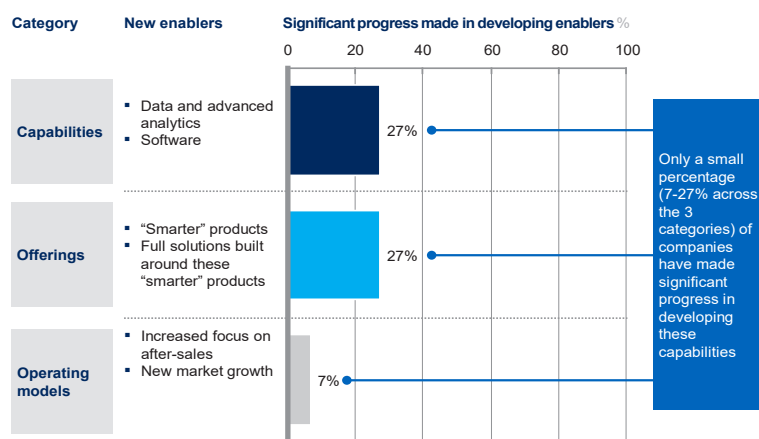
To expand their product offering, companies must be sure to put into place the necessary capabilities, including IT and software talent, cloud platform design and architecture capabilities, middleware/OS capabilities, and systems integration expertise.

In addition to creating smarter products, companies can extend product ranges by developing full-solution offerings (to include installation, monitoring, services, and integration, as well as broader production management systems). Taking that strategic step requires a more consultative, collaborative development process and efficient sales funnel. A first step is to identify and prioritize high-growth opportunities through systematic analysis of customer pain points and a strategic focus on creating more tailored solutions. Successful iterations may be supported by efficient coverage, incentives, support, and performance management to drive sales force effectiveness, as well as seamless collaboration between sales and operations in implementation.

Limited progress to date in developing enablers

Executives recognize the potential inherent in adopting a new playbook, but a significant gap remains between cognition and implementation. According to a McKinsey survey, limited progress has been made to date, with only 7 to 27 percent of FP&H equipment companies having made significant progress in building the right enablers (offerings, capabilities, and operating model) to capture the value from this growth (Exhibit 26).

Exhibit 26: A minority of companies have made progress on developing enablers

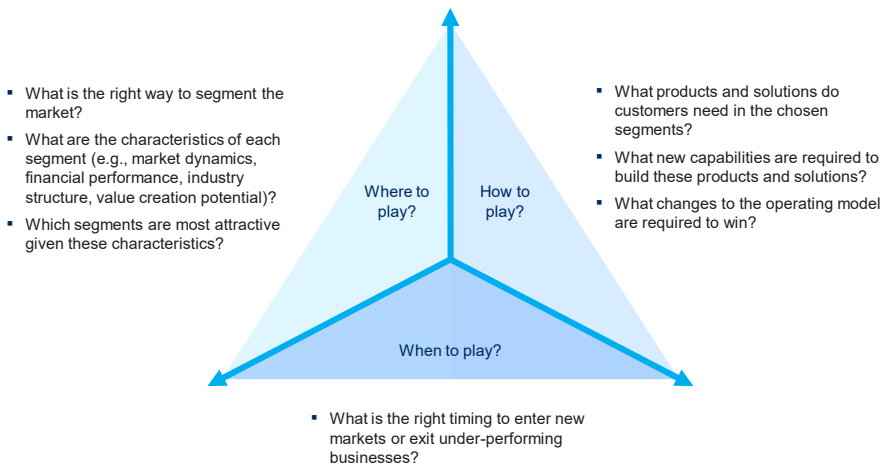


SOURCE: McKinsey FP&H Equipment Executive Survey

What is required to win?

The tailwinds driving the FP&H equipment sector will provide ample opportunity for companies equipped with the right enablers to outperform their peers and the overall sector. However, many companies try too hard to maintain the status quo and are left behind as markets change. As outlined in *Strategy to Beat the Odds*¹⁶, the cost of delay is steep, and those who wait too long are often too late to develop a strategically effective response. Companies that use the old playbook for success can be left behind as innovation disrupts the sector. Conversely, companies that get ahead of the curve can use major market transitions in their favor to tailor their strategies to a new environment. Going forward, we believe that companies must address three key questions to develop a winning strategy, get going, and scale up: where to play, how to play, and when to play (Exhibit 27).

Exhibit 27: Three key imperatives for a winning strategy to get going and scale up



Where to play

In developing a strategy to outperform the market, companies must first decide which markets to compete in. The unit of analysis used in determining strategy (i.e., the degree to which the market is segmented) significantly influences resource allocation and thus the likelihood of success¹⁶. Indeed, the study finds that markets should be segmented as narrowly as possible (within reason): “think 30 to 50 segments rather than the more typical 5 or so”¹⁶. The FP&H equipment sector comprises of a multitude of micro-markets, each with

¹⁶ Strategy to Beat the Odds: Have you tested your strategy lately (Chris Bradley, Martin Hirt and Sven Smit)

its own intricacies and inter-dependencies. For example, the food packaging equipment market can be analyzed on a geographical basis and by product segment, process steps, and materials used. Growth rates, competitors, customers, and risks need to be considered for each segment of the micro-market.

Once companies have determined how to segment their market, they must identify which are the most attractive segments, and why. A combination of factors - size, growth, and profitability-determines attractiveness. Additionally, within each micro-market, companies should seek to understand how much value is being created and the drivers of that value, including customer and competitor behaviors. Profit pool analysis can inform decision-making and help companies orient their planning toward specific activities, segments, and geographies (Exhibit 28).

Exhibit 28: Segmenting packaging machinery into profit pools by application and geography delineates high and low areas of opportunity

Food Packaging Total Addressable Market (by product and region) – 2016 to 2021

Legend: Areas of high growth (dashed blue box), CAGR 2016-24 heat map (red: >3%, yellow: 4-6% p.a., green: <3%), Market size: in bn USD (XX)

Product Segments	Regions																	
	North America			Europe			Asia/Pacific			Central and South America			Middle East and Africa			Total		
	2016 (\$B)	CAGR	2021 (\$B)	2016 (\$B)	CAGR	2021 (\$B)	2016 (\$B)	CAGR	2021 (\$B)	2016 (\$B)	CAGR	2021 (\$B)	2016 (\$B)	CAGR	2021 (\$B)	2016 (\$B)	CAGR	2021 (\$B)
Meat, poultry, and seafood	0.5	5%	0.6	0.4	5%	0.6	0.5	4%	0.6	0.1	4%	0.1	0.1	4%	0.1	1.5	5%	1.9
Milk and dairy	0.9	8%	1.4	0.9	5%	1.1	1.3	11%	2.2	0.2	10%	0.3	0.2	11%	0.3	3.5	9%	5.3
Fruit, nut and vegetables	1.4	7%	2.0	1.2	5%	1.5	1.7	9%	2.7	0.3	8%	0.4	0.3	9%	0.4	4.8	8%	6.9
Beverages	1.1	6%	1.5	1.0	5%	1.3	1.4	7%	2.0	0.2	6%	0.3	0.2	7%	0.3	3.9	6%	5.3
Industrial bakery	0.4	6%	0.6	0.3	4%	0.3	0.4	8%	0.5	0.1	7%	0.1	0.1	7%	0.1	1.1	6%	1.5
Grain	0.4	6%	0.6	0.3	10%	0.5	0.3	2%	0.3	0.0	2%	0.0	0.0	2%	0.0	1.1	6%	1.4
Total	4.8	7%	6.6	4.0	5%	5.2	5.5	8%	8.2	0.8	7%	1.1	0.9	8%	1.3	16.0	7%	22.4





SOURCE: BCC research, Freedonia

Finally, companies must understand how the specific micro-markets that are the most attractive fit with the company's capabilities, technology roadmap, and risk profile. For example, a FP&H equipment company in the primary

processing space, could consider expansion by integrating along the value chain into secondary processing equipment for similar protein types, or by leveraging their technology for applications across other proteins. When deciding whether a micro-market is the right fit and a feasible target, a company must consider: 1) its ability to produce the relevant technology that will fill a gap and differentiate the company in that specific market, and 2) its strength and ability to execute in that market- i.e., whether the company has the right infrastructure, capabilities, and business model for that market.

Being able to prioritize helps companies to focus opportunities in the most attractive areas. Since opportunities will vary by product segment, companies

Exhibit 29: Choosing where to play should be based on four criteria

<p>A Multiplier effect of trends on different product segments? </p> <ul style="list-style-type: none"> How will trends affect different product segments? How are both incumbents and challengers affected? How will marketplace dynamics be changed (e.g., suppliers, competitors, customers, regulators, investors)? 	<p>B Structure and conduct of players in the segment? </p> <ul style="list-style-type: none"> What are current and expected future industry structures (e.g., supply/demand cost curve, fragmentation, regional dependence)? What is the current and expected future conduct of industry (e.g., nature/level of competition, pricing models, level of collaboration)?
<p>C Financial performance? </p> <ul style="list-style-type: none"> What has been aggregate and individual-segment performance in past 15 years? <ul style="list-style-type: none"> Revenue and margin Economic profit Multiples TRS What are expected future performance and rationale? 	<p>D Value creation? </p> <ul style="list-style-type: none"> What is full value/multiplier effect from inflection point? Has the market overestimated headwinds? If so, by how much? Does a turnaround candidate exist to build on? What roll-up opportunities exist? What is operational/margin improvement potential?

Note: Not exhaustive

need to develop a coherent growth strategy that addresses four questions for each product segment (Exhibit 29).

Understanding the dynamics, characteristics and subsequent potential in each of these micro-markets - while also grasping with how these micro-markets fit with a company's respective strengths- is essential for companies to address where they want (and are most able) to play. Indeed, defining and understanding segments correctly is one of the most practical things a company can do to improve its strategy.¹⁵

How to play

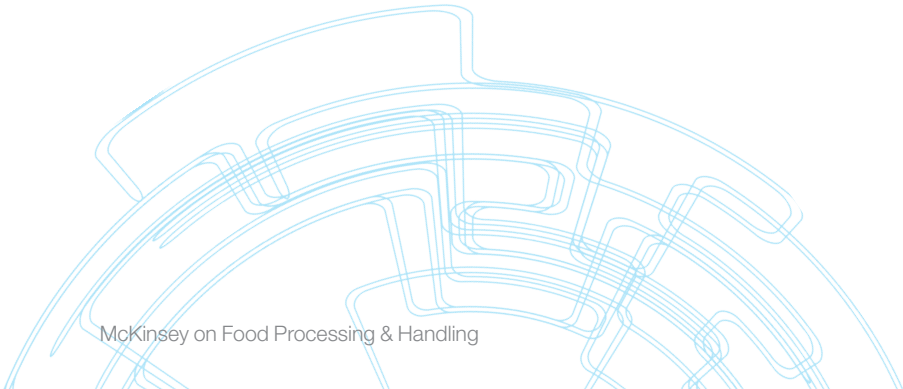
After deciding which markets to prioritize, companies need to develop a robust understanding of how to play in these markets. Depending on the nature of the prioritized markets, following the traditional play book may not be enough to be successful.

As noted in earlier sections, winning in these markets may require a different set of products and solutions (e.g., connected or cloud enabled products), new capabilities (e.g., software and solutions capabilities, advanced analytics capabilities), and new operating models and organization (e.g., new go-to-market approaches). For example, in the FP&H equipment space, the shift towards solution selling is requiring sales forces to adapt. Companies are increasingly required to develop more technically proficient sales people who can convey the value from total cost of ownership.

Once the playbook required to win is clearer, companies often must choose how to address any gaps in this playbook - whether to do it organically or to pursue partnerships or acquisitions. M&A can accelerate a variety of strategies that are too expensive, time-sensitive, or competitively critical to rely on an organic approach. Some examples include pursuing growth in adjacencies without access to customers or distribution, a strong brand name in a specific niche, or the talent and capabilities to develop machine-learning algorithms.

When to play

Strategy is not just about where and how to play, but also when to play. Once a company has figured out which micro-markets to enter and created its playbook for developing a differentiated offering in those markets, the company must strategically time and sequence its investments in new areas. Committing too early can be a leap into the unknown; instead, companies can make small investments by running a pilot that targets select customers in a new market and then using the findings from that pilot to scale up offerings. This effort requires a company to have clear metrics and processes for tracking the signals from its investments so that it can move quickly to scale. Conversely, being too late is also dangerous, because opportunities can expire, or rivals can seize advantage while a company stands on the sidelines. If companies choose to take a fast follower approach, they must be able to monitor market developments so as not to be left with an insurmountable challenge.





Innovation in food processing and handling: An interview with the CEO of Welbilt

For more than 85 years, Welbilt has prospered by bringing innovation to the food service equipment industry. We asked President and CEO Hubertus Muehlhaeuser to share some thoughts on how Welbilt and other food-service equipment providers can bring innovation to the table, today and tomorrow.

What do you think will be the most important source of innovation for Welbilt and the industry moving forward?

Without a doubt, the enabling capabilities of analytics and digitalization. Digital must become a core competence of equipment providers across the food service industry.

How will digital affect relationships with customers?

Digital is already changing the way Welbilt interacts with customers. Traditionally, we sold individual appliances—ice machines, fryers, grills, and so on—separately. Now digital connectivity is bringing these separate lines of business together, enabling us to co-develop solutions with our customers. Our relationship will extend over the life cycle of the system solutions, as there will be numerous opportunities to upgrade our product solutions and services based on real-time information.

How does co-development work?

Our technology center in New Port Richey, Florida, houses all of our technologies in one place. We invite customers to come and play with the technologies. Here, we also have a prototyping center where we can build mockups to see how automation would change the work flow in a kitchen. That's a completely new way of partnering and collaborating with our customers—admittedly, one that other industries discovered 10 or even 20 years ago. We were a bit late to this party but won't let that happen again.

We're moving into offering software as a service, so that customers can retrieve data from their kitchen equipment. We're also moving into consumables—selling not only the machines, but also the food that goes into them and for continued processing. Digitalization makes these things possible and leverages the opportunities.

Why do you think that customers want these capabilities from Welbilt and other companies?

Primarily to improve cost management. Our customers—specifically the quick-serve restaurants (QSR) like McDonald’s, Wendy’s, Burger King, and Starbucks—face enormous labor cost pressure. As you know, the food service industry has tremendous potential to use automation to decrease labor cost.

Our customers are looking to cut other costs as well—such as rising costs for energy and rent in prime locations and the cost of producing and then wasting too much food. The data that customers can access thanks to connectivity can help them manage energy consumption, space requirements, and food waste much, much better.

Does using automation to reduce labor costs imply that the food service workforce will shrink?

I don’t think so. The major QSRs, the largest employers in the country, don’t see automation as just a labor-reduction play.

Their primary objective is to increase output per square foot of space to enable same-store sales growth. I envision, within a year or two, people ordering their food by cell phone before they reach the restaurant. The order will go directly to the relevant appliance, which grabs the food, starts cooking it at the time dictated by the customer’s distance from the restaurant when placing the order, and packages just in time when the customer arrives. The result is efficient production to order, with no waste and greater food safety as the process eliminates the possibility of human contamination.

But this automation does not eliminate the need for human interaction. QSRs will redeploy people from the kitchen where the customer can’t see them to the front of the house where they can add value at the interface.

What steps has Welbilt taken to prepare for this future?

We’ve done a lot of transformation in the last three years. We started by having the entire leadership team talk externally and internally about the need for change to get Welbilt focused on solutions and systems. We had to ensure that people understood this as a top strategic priority supported by leadership, from the CEO down through the entire organization.

Then we implemented organizational changes to equip Welbilt to lead the industry in solutions and systems. We created two groups.

First, the FitKitchen group. This dedicated group brings end-to-end understanding of kitchen processes and all of our technologies that can work with customers to redefine products and develop solutions.

Second, a digital group. Initially, we put digital and connectivity capabilities in our product lines, which worked so well that we are perceived as the industry leader in doing that. But we've decided to carve out that group and give it P&L responsibility, with full accountability for its costs and profits.

We expect the two groups to work together, demonstrating the power of the approach to the rest of the organization and laying the foundation for a completely new operating model in the industry.

What do you think the next generation of innovation in the industry will look like?

I see home delivery as the last mile in our industry. People want food that's eaten, but not produced, at home.

Pizza restaurants and chains have been working on this delivery model for decades, but the model has a flaw. The average time to get a pizza delivered in the US is about 30-45 minutes, and that's far too long for a freshly produced product. Keeping the product fresh requires lots of preservatives, which goes completely against the trend toward fresh and healthier food.

Therefore, I think the key will be automating that last mile of delivery—putting equipment on food trucks to bake, grill, and fry in transit. In Silicon Valley, Zume Pizza is working to revolutionize that last mile of food delivery. Their food trucks are full of pizzas freshly prepared in the morning. Zume uses artificial intelligence to review recent buying patterns and determine how many pizzas people will need in the various parts of the city and what ingredients those pizzas should include.

Then the trucks drive around the city, ready to fill orders transmitted automatically to the trucks. In-truck automation takes the fresh pizzas out of refrigeration, puts them in the oven, and delivers them in just a few minutes.

I think it's only a question of time until companies do that with burgers. The market potential is huge. In the US, people spend 50 percent of their disposable income on eating outside their home. This would bring the food home, fresh and made with better ingredients.

What makes you bullish on this innovation-based future?

Food service is an ever-growing industry. People need to eat. Wear-and-tear on equipment means replacement, which offers opportunities for innovation. Consumer preferences for fresh and healthy foods favor food that's made to order.

Two years ago, I would have doubted whether customers would be open to our direction to take a solutions and systems approach to serving them. But now customers are asking us to go there, as quickly as possible. They appreciate the potential to cut costs, offer their people more interesting jobs, create better food, and become more customer-focused.

We are bringing innovation literally to the table. Other industry players talk about our technology centers, and I expect some to follow our lead. They will face challenges. Innovation is expensive, and finding the right talent takes time. But the innovation-based future looks bright for Welbilt and the industry. Bon appétit!



Conclusion

The FP&H equipment sector has seen rapid growth in recent years. This growth is set to continue amid rising demand from emerging markets, changing consumer preferences, and the drive toward automation due to operational and cost pressures. The future is bright, and executives are optimistic that the sector will outpace broader economic growth in the years ahead. However, the sector is in danger of resting on its laurels. Action is required to turn potential into reality.

Industry executives understand that a new playbook is needed. Companies must embrace technology and robustly engage with the dynamics shaping the sector and the changing demands of the global market. Companies require new capabilities, new and smarter products, and in some cases reimagined operating models that focus on established and potential areas of growth.

Of course, no company can be all things to all people. Incumbents must now assess their current position and identify the right strategy to take the business forward. Based on micro-segment profit pool analysis, they must decide where to play; then they must decide how to play—which products, capabilities, partnerships and value-capture strategies will make them successful in these micro-segments.

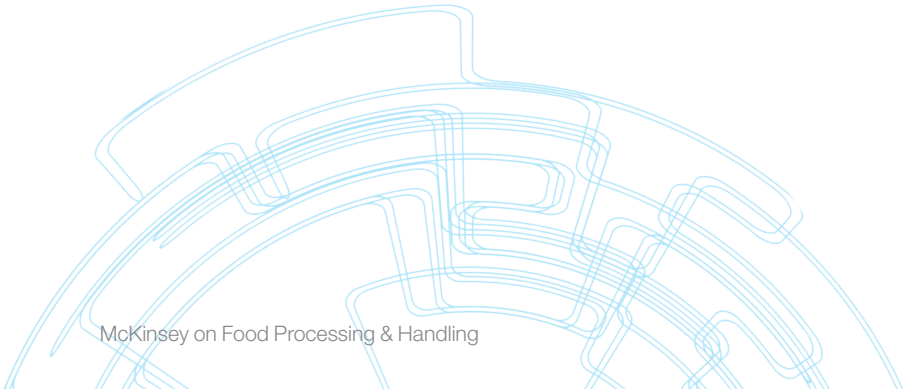
Finally, once a company has figured out which micro-markets to enter and created its playbook for developing a differentiated offering in those markets, the company must decide when to play, and strategically time and sequence its investments in new areas.

Glossary

Advanced analytics	A range of analytic techniques and tools for the acquisition and transformation of raw data into information to predict future outcomes
CAGR	Compound annual growth rate (CAGR) describes the mean annual growth rate over a number of years
Capital Turns	Sales/Average Invested Capital excluding Goodwill
Cloud computing	On-demand delivery of power, database storage, applications, and other IT resources via the internet
Earnings Multiple	Earnings Multiple = Net Enterprise Value (NEV)/Earnings before Interest, Taxes, and Amortization (EBITDA)
EBIT	Earnings before Interest and Taxes
EBITA	Earnings before Interest, Taxes, and Amortization
EBITDA	Earnings before Interest, Taxes, Amortization, and Depreciation
Economic Profit (EP)	Economic Profit = Net Operating Profit less Adjusted Taxes – Weighted Average Cost of Capital (WACC) x Invested Capital (IC)
Employee productivity	Earnings before Interest, Taxes and Amortization (EBITA) per employee
EP/R	EP/R = Economic Profit/Revenue
IC	Invested Capital
Internet of Things	Integration of connected software and data gathering software into physical end devices to allow exchange of data
Leading companies	Companies that were in the top quartile of their product segment on EP/R performance

NEV	Net Enterprise Value
NOPLAT	Net Operating Profit less Adjusted Taxes
Trailing companies	Companies that were in the bottom quartile of their product segment on EP/R performance
Tangible Capital Ratio	Average Invested Capital excluding Goodwill/Average Invested Capital including Goodwill
TRS	Total Return to Shareholders, including capital gains and dividends
WACC	Weighted Average Cost of Capital





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