

**Highlights from a European
Virtual Roundtable on**

**Meeting the SKU
Demand Challenge:
Multifunctional Equipment
and Changeovers**



► Executive Summary

On March 30, 2021, GE Digital and the FSO Institute conducted a 90-minute virtual roundtable discussion with nearly 20 European Consumer Packaged Goods (CPG) companies on *Meeting the SKU Demand: Multifunctional Equipment and Changeovers*. The roundtable focused on both the challenges CPG manufacturers face and the solutions they've put in place to meet the ever-increasing consumer demand and proliferation of SKUs. Following are the key highlights and takeaways from the roundtable:

- By far, the greatest challenge is related to **increased downtime and reduced throughput** resulting from an increased number of changeovers required to manufacture more SKUs.
- **Recruiting and training the workforce for higher level skills** continues to be a challenge for CPG manufacturers, especially as they automate to offset labor shortages only to face the need for higher level skills to operate more sophisticated lines.
- As manufacturing complexity increases, the **need grows for communication and a common language that all can understand**, especially around “cost” as a common denominator and what that means when considering a strategy of shorter versus longer runs to meet consumer demands.
- Related to “cost” is profitability, so both a **holistic and item-by-item SKU profit analysis should be included in a business case** that is communicated and understood by all stakeholders, especially senior management.
- **Operational improvements and equipment flexibility are two key areas that CPG manufacturers can improve upon** to address consumer demand. Single-Minute Exchange of Dies (SMED) and Lean can help improve operations while flexible equipment, especially end-of-line flexibility where late-stage differentiation occurs, can enable greater agility regarding e-commerce demands.
- The myriad of solutions CPG manufacturers are considering or putting into play: **finding ways to reduce downtime, increase run speeds, maintain product quality and get the most out of their assets (asset reliability)**.
- It seems pretty clear that **consumer demand is here to stay**. In fact, a recent study by Consumer Brands Association concludes that while sales of CPGs will retreat slightly from the past year during COVID lockdowns, they will remain well above pre-pandemic levels going forward.¹
- In the face of ongoing consumer demand, **CPG manufacturers continue to meet these demands with resilience, adaptivity and innovation**.



¹ The CPG Post-Pandemic Outlook: Five Trends Emerging From COVID-19 That Will Redefine the Industry. Consumer Brands Association, 2021.

About This Roundtable

The proliferation of SKUs, driven by consumer demand coupled with the “thinning” or downsizing of Food & Beverage/CPG companies, has put tremendous pressure on CPGs to do more with less than ever before. Accordingly, CPGs are looking for all types of opportunities to improve productivity, including—to name just a few—new technology applications, Lean principles, outsourcing, new equipment design and changeover improvements.

In this virtual roundtable, a panel of experts in Food & Beverage manufacturing discussed the greatest challenges they face, the solutions they have put in place and the results they have achieved when it comes to multifunctional equipment and changeovers in addressing the SKU demand challenge.

Topics discussed included the drive to shorter runs, dedicated lines, toolless equipment, efficiency and flexibility, new equipment design, new technology applications, and the effects of e-commerce.

This unique 90-minute format featured input from the panelists to help jump-start participants’ thinking. So that participants could get the most from the roundtable, they were invited to share their own challenges, solutions and results.



► Consumers in Charge: A Pull Model of Manufacturing

Over the past several years, the FSO Institute, in cooperation with PMMI's OpX Leadership Network, has conducted multiple focus groups with hundreds of CPG manufacturers to keep abreast of and document the most significant issues affecting them on a day-to-day basis. The culmination of these many focus group discussions is shown in the supply chain dynamics of the Pull Model of Manufacturing found in the Appendix. A quick review of this model was provided to help put the European Roundtable topic on SKU demand in a broader perspective.

It shows how consumer demand impacts upstream stakeholders, including retail and distribution, CPG product manufacturing and OEM equipment manufacturing. It is the CPG product manufacturing piece of the puzzle shown in the Pull Model of Manufacturing that is the focus of the European Roundtable topic, particularly multifunctional equipment and rapid, cost-effective changeovers. Additionally, this piece of the puzzle includes:

- Innovation
- Equipment Costs
- Skilled Workforce
- Leaning (Thinning) of Manufacturing
- Regulations and Standards
- Collaboration and Process Improvement
- Globalization

Although this model reveals CPG thinking in a pre-COVID environment, a recent study by the Consumer Brands Association (CBA) reveals that sales of CPGs are expected to retreat slightly from the past year due to the impact of COVID lockdowns but will remain well above pre-pandemic levels going forward. As CBA President and CEO Geoff Freeman notes, "There is no 'normal' to which the industry will return—urgent transformation is the only way forward."²

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– Geoff Freeman
CBA President and CEO



¹ The CPG Post-Pandemic Outlook: Five Trends Emerging From COVID-19 That Will Redefine the Industry. Consumer Brands Association, 2021.

► Meeting the Challenge: What CPGs Are Thinking and How They're Responding

Participants

To help jumpstart participants' thinking on the challenges they face regarding SKU demand and to help ensure that the panelists addressed them, participants shared their concerns in a pre-roundtable exercise that then was previewed by the panelists and reviewed by all during the roundtable. A brief capture of their input includes:

- Increase sales through manufacturing flexibility and adaptability using good planning and stock management
- Improve workplace and workforce agility
- Anticipate and manage yield fluctuations
- Determine SKU complexity versus operational efficiency
- Balance shorter runs with longer, more efficient runs
- Manage complexity of shorter runs including changeovers, clean down, hygienic design of equipment, allergen control
- Optimize changeovers, improve production flexibility
- Reduce downtime, improve run speed, while preserving consistent quality
- Maintain economic competitiveness in a scattered SKU environment
- Govern portfolio SKU complexity and demand volatility (COVID impact), adjusting to high production minimum order quantities for slow movers and minimizing goods destroyed
- Manage supply chain pressure due to wider customer demand of packaging formats; continuously reassess customer/consumer expectations of products and how to reliably deliver in a changing marketplace



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Panelists

John Giles, Manager – *Ada Engineering, Amway*

Joe Zembas, Senior Manager – *Reliability Engineering, The JM Smucker Company*

Dr. Bernard Cubizolles – *Global Product Marketing Manager, GE Digital*

Panelists were asked to share their perspectives on three fundamental questions regarding the proliferating SKU demand: a) the greatest challenges they are facing, b) the solutions that have been put in place (or are being considered) to address these challenges and c) some of the most significant outcomes/results they have achieved. Here are some of the highlights of the panel discussion:

Greatest Challenges

- The panelists noted that they share many of the same challenges faced by the roundtable participants.
- The biggest challenges for all relate to downtime and throughput due to an increased number of changeovers.
- These challenges have led Amway to focus on a shift when possible from manual to more automated processes. However, one size does not fit all since a move to automation may require customization, depending on the situation. Accordingly, a dedicated in-house team of experts was assembled to address this.
- Another challenge faced by all: how to focus on rapid changeovers while maintaining quality consistency. Perhaps one of the greatest challenges for all is addressing the different skillsets required for automation. Somewhat paradoxically, an automation strategy born out of labor shortages and poor skillsets exacerbates the problem as greater skillsets are required for more sophisticated equipment. Further complications in the workforce are emerging with the so-called “brain drain” as knowledgeable workers retire.

- Panelists also noted that while many of these challenges existed prior to COVID, they have been greatly complicated by COVID-related lockdowns, restrictions, quarantines, remote work and worker safety.
- A major challenge for The JM Smucker Company is developing a common set of communication/language when confronting increased demand, specifically the common language of “cost” and what that means. “Cost” is a common denominator for all CPG manufacturers regarding the viability/profitability of the ever-increasing number of SKUs. While it may be difficult to gain consensus on a shared strategy with too many inputs, “cost” is something all stakeholders can understand. As an example, when considering “cost” of changeovers for shorter runs, “cost” can include staffing, startup materials loss, in-process material loss, cleaning supplies, allergen controls, etc. For longer runs, “cost” can include stale ingredients, lost inventory, customer dissatisfaction with product and the “costs” associated with missing out on shorter run opportunities when relying solely on longer runs. What’s really important in a common language/communication is clarity on the consequences of choices made between longer runs versus shorter runs and balancing customer loss versus product loss if the decision made is incorrect. The right answer seems to lie somewhere in the middle. Decisions may vary by company, site location, product, etc. Most important is which economic model is chosen and how it is communicated.
- A challenge many CPG manufacturers are facing is how to build in more visibility in production lines to better understand just how good they are at producing product. The challenge here is how to get granular visibility to compare SKU cost/profit. Because automation and software can make a huge difference, this is a great place to start the digital transformation that helps highlight how things are actually done on the plant floor. As asset performance becomes more important, workspace design can be rethought with a greater focus on people.

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Solutions Put in Play

Amway has many initiatives and a multitude of variables to consider when addressing solutions. Its biggest focus right now, however, is the use of collaborative robots (Cobots), and it has centered its training on two levels. For the safety-focused introductory training, leadership dealt with employees' fears of using Cobots, learned how to ease their anxiety and taught them what to do if problems arose. For the advanced robotics training, designed for technical operators and maintenance employees who normally don't receive this level of training, leadership had to learn how to let go of control. Additional initiatives that Amway has put in place include focusing on the human factor in decision-making when troubleshooting and performing diagnostics, documenting the changeover process in a simple (not complex) way, increasing emphasis on maintenance training, conducting more Kaizen™ events on automation components, and increasing upfront collaboration with internal business partners (marketing, R&D, sales, etc.) to help make products easier to manufacture.

A case study at The JM Smucker Company provides an excellent example of a solution put in place to address consumer demand—taking the Dunkin' Donuts coffee brand into retail stores. In this case, manufacturing worked closely with internal business teams (marketing, sales, R&D, etc.) to design multiple SKUs in commonality with late-stage differentiation for various flavors, sizes, packaging, etc. Since 80% of packaging was the same, unique labeling was used for late-stage product differentiation. The feed of different coffee blends was positioned right above packaging for easy fill for each SKU. This setup enabled shorter changeovers with lower inventory levels while increasing throughput with the same levels of staffing.

GE Digital has a variety of solutions, some of which have been put in place or are being considered by their clients, including digitized work processes, increased focus on standards and on standard work, increased emphasis on discipline to ensure consistency and accountability, and a heightened focus on the onboarding of younger employees to speed the learning curve, thereby maintaining consistency in the manufacturing process.

Most Significant Outcomes

- For Amway, the most significant outcome of solutions implemented to address ever-increasing demand is the development of small automation cells using Cobots. While this has resulted in a reduction of manpower, it has created challenges in the level of skillset required to run these automated lines. Amway continues its focus on training to address the human element in decision-making in a way that helps generate the best decisions. Interestingly, COVID lockdowns have forced employees to stay dedicated to small automation cells, which is a real benefit as employees are not allowed to go into different areas of the plant due to COVID restrictions and are, therefore, much more focused on the tasks immediately at hand.
- GE Digital clients start out with small steps that can make a significant contribution to meeting ever-increasing consumer demand. They concentrate on a key area of digital transformation—such as changeovers—that can be implemented easily and then scaled up. For one client, less raw material and fewer KPIs to measure simplified a batching process and marked the beginning of the client's digital transformation.

Additional input on challenges and solutions from more than 200 CPG manufacturers in a series of focus groups conducted at PMMI's PACK EXPO Las Vegas in 2019 is shown in the Appendix.

One of the most significant outcomes for The JM Smucker Company is the convention-defying purchase of three slower—but more agile and flexible—pouching units rather than repairing a 30-year-old faster machine that would have had more downtime. For JM Smucker, this repair-versus-replace conundrum provided a real opportunity to reduce downtime and increase throughput.



Roundtable Discussion (All)

During the roundtable discussion, participants' challenges listed above were addressed. Highlights of the conversation among the participants and panelists regarding these challenges include:

Building the Business Case

- There is considerable variation in how a long runs versus shorter runs strategy is justified, so the biggest challenge is determining the best way to build a business case that settles how a company wants to “cost” things (including what’s included and not included in the calculation) and getting everyone aligned on it.
- Business cases vary by company, location, product, etc., so developing cross-functional teams to identify the appropriate strategy and get aligned on them can provide both direction clarity and role clarity for all involved. If asked how and why changeovers are better, there should be an answer.
- More SKUs invariably mean more changeovers. The extent to which they are beneficial depends on the business case balancing business needs versus costs. Often there is too much complexity in the overall calculation for all to understand, so there may be a need for a simpler, easier to understand model or explanation. The details of the case should be presented in a way that are both readable and manageable, especially for top management.

Another key is to challenge management to understand which SKUs are most profitable. In fact, it is eye-opening to learn that many are not profitable. While marketing can sell the consumer value of more SKUs, manufacturing should be able to show whether an item can be manufactured at a profit. For example, only three of 17 SKUs of lipstick may be profitable, but consumers want one or more of the remaining 14 to choose from or they may shop elsewhere. This requires a more holistic view of the overall profitability of product lines/groups (in addition to an item-by-item analysis) so that a true picture of profitability can be shown. One other important factor in this calculation involves considering the reality of installed existing assets versus greenfield. An item may be profitable in one scenario, but not in the other.



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Agility

- Ever-increasing consumer demand puts a high premium on a manufacturer's ability to be agile—a common challenge among the manufacturing community.
- With the advancement of e-commerce, agility can mean a focus on two key areas: operational improvement and flexible equipment. Single-Minute Exchange of Dies (SMED) is an example of an operational tool that can substantially reduce changeover times and improve operational efficiency.
- Flexible equipment improves agility, especially end-of-line flexibility, because that's where so much of the late-stage differentiation necessary for e-commerce success takes place. Accordingly, more manufacturers are making investments in this space.

Automation and the Workforce

- For some, investment in automation can create a challenge by taking required workforce skillsets to even higher levels, thus exacerbating an already tight labor market. This is especially true where manufacturers are competing for talent.
- For others who have already made investments in automation, there are fewer people in the plants and higher levels of automation, so they see the automation/workforce skills dynamic as an evolution rather than a crisis. For their employees, especially engineers, learning is a natural process, as is adapting to change.

Downtime, Speed and Quality

- Reducing downtime, improving run speed and maintaining consistent product quality is another common challenge CPG manufacturers face.
- One significant issue across these challenges is managing the variety of packaging formats driven by e-commerce demands in a "circular economy" environment. Just as SKUs have risen so, too, have consumer demands regarding "clean," sustainable products and packaging. To solve these challenges, increased focus has been placed on fostering process innovation and small operator-driven improvements by engaging the workforce—our internal experts—as never before.

Yield

- Most CPG manufacturers are challenged with the fundamental goal of getting the most out of their assets. And when it comes to the proliferation of SKUs, it invariably leads to yield loss.
- A critical question to ask about yield: Do you actually need the extra capacity resulting from changeovers? Don't do it if you don't need to. Again, consider the business case and its prescriptions, which should address this question.
- The business case also should provide the answer to this question: Why invest in a production line that is only marginally utilized? It is important to stay diligent and keep referring to the business case regarding its current viability. Decisions made about the business case a year ago may not still be relevant today.

► A Few Key Takeaways: Now and Then

As mentioned above, additional input on challenges and solutions from more than 200 CPG manufacturers in a series of focus groups conducted at PMMI's PACK EXPO Las Vegas in 2019 is shown in the Appendix of this report. If we use this data as a baseline, we can look at the findings from this more recent roundtable to surmise what has remained the same and what might have changed in the past 18 months or so. Here are a few takeaways from now and then:

Some challenges remain the same while others have recently emerged:

- The need for agility to address complexity in the changeover process is still front and center to reduce downtime and increase throughput for most CPGs.
- Labor turnover (and recruitment) as a multiplier of equipment sophistication—high tech equipment in a low tech environment—continues to be a challenge for many as well.
- As before, lots of changeovers require lots of human touches, especially for those not automating some production operations.
- New to the discussion in this recent roundtable for some is the challenge of putting together a solid business case that addresses the common denominator or “costs”—what goes in (and out of) its calculation and what are the consequences (profitability and otherwise) of deciding on a strategy of shorter versus longer runs to address consumer demand.
- While getting the most out of company assets has been a longtime challenge for CPGs, a heightened emphasis on asset reliability is somewhat new to the discussion, especially for addressing yield loss due to increased downtime and decreased throughput.

Likewise, some solutions remain familiar while others have recently emerged:

- Then and now, CPG manufacturers are looking to find ways to simplify the changeover process. However, what's changed for some is a greater focus on documenting these processes and incorporating them into standard work.
- While cross-functional teams previously were in the mix of solutions, more CPGs are formalizing their development and implementation, especially including marketing, R&D, sales, etc., in the process. A key feature of these cross-functional teams is to align on what products are truly manufacturable, preferably at a profit.
- Adaptive machines mentioned as solutions in the 2019 PMMI Vision 2025 data have taken flight more recently with the increased use of Cobots, as seen in solutions put in place by some of the recent roundtable participants.
- Of particular importance is how CPG manufacturers are responding to workforce challenges via increased automation. While some are decreasing the number of people in the plants as a result, others are cross-training and repurposing their workforce across the enterprise.
- Although a challenge mentioned above, putting together a strong business case for addressing consumer demand and getting all internal stakeholders aligned on it seems a very promising solution for most CPG manufacturers.

The bottom line: While many of the challenges facing CPG manufacturers regarding ever-increasing consumer demand have remained, the CPG manufacturers continue to demonstrate innovation and resilience. As one roundtable participant noted about the workforce challenges, “we view them more as evolution than as problems.” Judging from the adaptive responses shared in this roundtable, there's every indication that these CPG manufacturers feel the same way about most of their challenges!

APPENDIX

Pull Model of Manufacturing



Additional CPG Input

Currently, what are the top 2-3 specific challenges you face regarding multi-functional equipment and changeovers?

- 39%** Achieving repeatability/changeover set up
- 34%** High tech equipment in a low tech environment
- 23%** Lots of changeover require lots of human touches
- 20%** Complexity of the changeover and footprint
- 16%** Pace of change
- 11%** Cost of flexibility and reliability
- 11%** No time, no tools, no talent
- 11%** No/minimal changeover required
- 9%** Easy retrofit
- 2%** Skills set

PMMI Vision 2025 2019 PACK EXPO Las Vegas

Percentages shown above represent the percent of focus group participants who "Liked" a particular topic via an online audience participation platform.

What are you (if CPG) or your customers (if OEM) working on right now to address these challenges?

- 30%** Simplification for changeover process
- 23%** Cross functional reliability teams
- 21%** Designing adaptive machines
- 21%** Design in ease of operation
- 19%** Intuitive machine design
- 16%** Cross train personnel from other departments
- 16%** SOPs via visual aids
- 12%** Programs to retain skilled workers
- 7%** Remote access
- 7%** Reduce operator turnover
- 5%** Predicting capability needs 3-5 years out
- 5%** Identifying and understanding lagging indications
- 5%** Develop low cost equipment for changeover
- 5%** Reliable software for interface
- 5%** Customization downstream to co-man
- 2%** Systems for maintenance
- 2%** Use market analytics from field



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