

June 2022

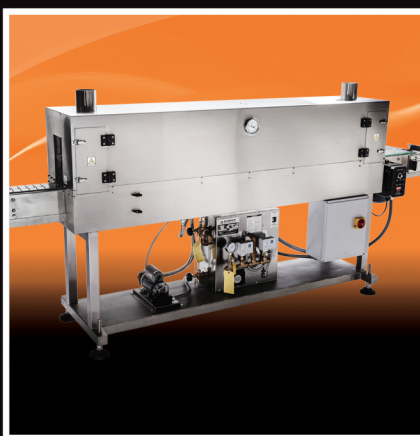
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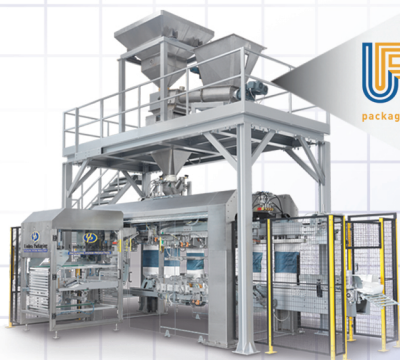
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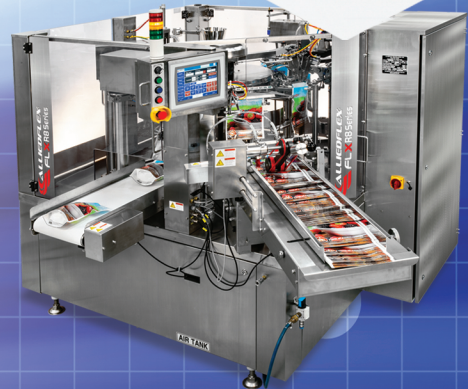
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EDITOR'S NOTE

Reducing Reliance on Single-use Plastic

First of all, thanks to everyone who is contributing features to Packaging Technology Today! This issue is packed with insights about innovative new packaging materials and equipment.

Based on my inbox, the one topic on everyone's mind right now is sustainability.

Two authors contributed compelling articles about strategies to reduce our reliance on single use plastic packaging, and they inspired me to dig a little deeper to understand the extent of the problem.

More than 40% of all plastic produced is used to make packaging material according to a report in Science Advances, and the vast majority of that packaging is used only once. Roughly 9% is recycled, 12% is incinerated and 79% is accumulated in landfills or the natural environment. In fact, the National Oceanic and Atmospheric Administration reports that plastic is the most common marine debris, and it is estimated that up to 12 million metric tons of plastic ends up in marine environments annually.

The U.S. is actually responsible for more plastic waste than any other nation due to our preference for convenience, and each American consumer throws away about 300 pounds of plastic every year.

Take a look inside to learn how the packaging industry is developing solutions to address plastic waste, and the collaborative efforts underway between OEMs, packaging manufacturers and consumer packaged goods companies.

Stay tuned for our July issue when we will share more sustainable packaging solutions, and keep sending me your fantastic features! Request our [media kit](#) to see our editorial calendar, and the sponsorship opportunities our publisher Randy Green coordinates through social media, monthly e-newsletters, e-books and special reports.

Thanks for reading,

Vicki McDonald-Kastory
Editor, *Packaging Technology Today*
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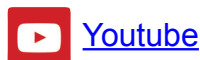
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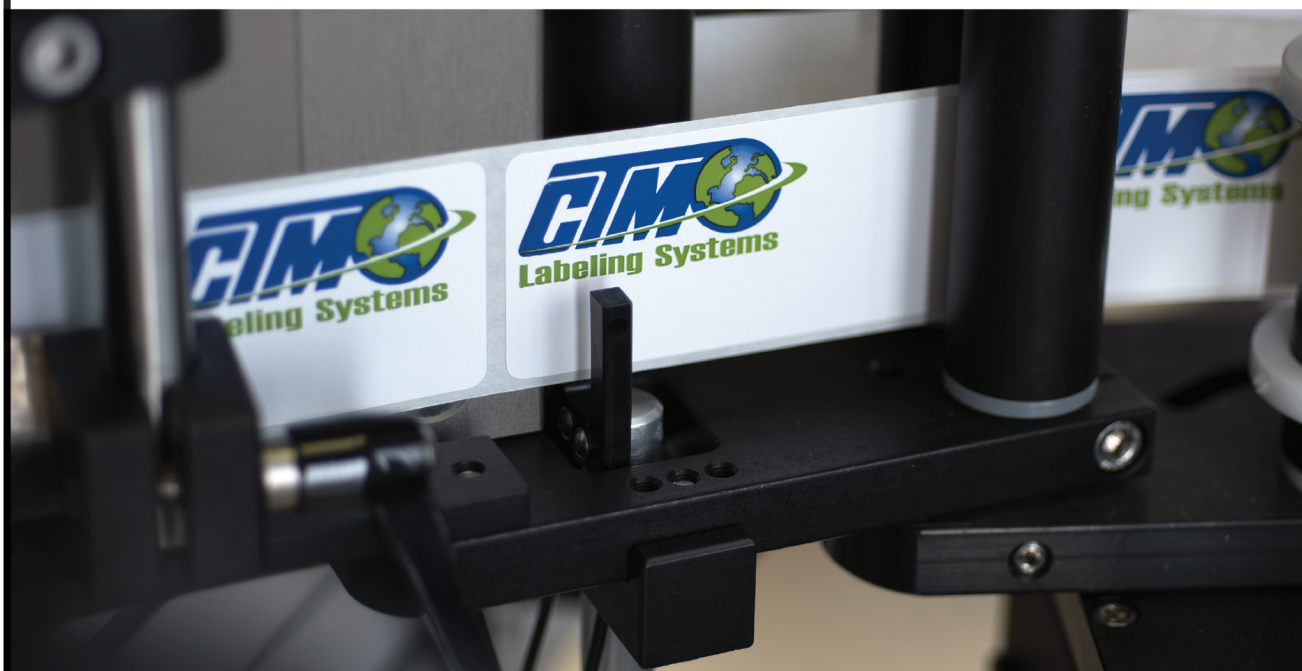
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Flexible pouch packaging is trending now and for the foreseeable future.

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The EBS-6600 Series is an entirely new and improved small character ink-jet system designed for exacting in-line product and package coding.

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Companies are exploring the use of traditional and flexible packaging to learn how different formats impact consumer preferences and sales. Image Courtesy of ALLIEDFLEX Technologies, Inc.

AN INSIDER'S VIEW OF PACKAGING DYNAMICS

FLEXIBLE POUCH PACKAGING IS TRENDING NOW AND FOR THE FORSEEABLE FUTURE

By Dennis Calamusa, President and CEO of ALLIEDFLEX® Technologies, Inc

The flexible pouch packaging industry continues to see unprecedented growth throughout a multitude of market sectors. Never has a packaging methodology spanned such a broad cross-section of markets and applications. Flexible Pouch Packaging has dramatically evolved over the past few decades beyond a simple bag, pouch, or wrap.

As a major North American flexible packaging machinery solution provider, we benefit from a unique view and perspective on the flexible packaging industry and enjoy a keen insight into the evolving trends and dynamics taking place in the packaging market. Our perspective is primarily based on the fact that we actively interface and collaborate with a multitude of stakeholders including multi-national consumer packaged goods companies (CPGs), start-ups, entrepreneurs, co-packers, and the entire supply chain of flexible packaging

material and other important ancillary suppliers to the industry.

Today's flexible packaging is sophisticated, customized, and elegant in both design and functionality. Through the incorporation of value-added features including zippers, spouts, fitments and other dispensing features, the flexible package can effectively compete with or replace most methods of traditional packaging from a cost and functionality perspective.

Differentiate brands online and on store shelves

The flexible package format can deliver a unique character or personality of its own through the incorporation of simple or more elaborate customized die-cut shapes. The benefit of dynamic, colorful flexographic, rotogravure, or digital printing can also not be overlooked as

a huge marketing benefit on the crowded retail shelf.

Almost every product or application can be a candidate for packaging in a pouch as an alternative to a rigid bottle, can, jar or bag in a box format. Packagers are constantly looking for ways to increase sales and grow market share, particularly during these competitive times. If you are a start-up or entrepreneur, you are also looking for an opportunity to enter the crowded retail landscape in a way that will best position your product or brand for success. Flexible packaging is proving to be a powerful strategic marketing tool in obtaining that important foothold to market success. Offering the right stuff at the right time.

In recent years, package differentiation has proven to be a key component toward market success, particularly if your packaging is different than the market leader who has been utilizing the same packaging methodology for decades and is reluctant to change due to existing infrastructure challenges.

However, most packaging leaders are beginning to realize the important balance between the utilization of their successful traditional brand packaging and the importance of transitioning toward new and different packaging alternatives that are proving to appeal to a new generation of consumers and possibly better suited to the evolving marketing strategies of a new era.

New markets are transitioning to flexible packaging

As flexible packaging grows in popularity with consumers, we are starting to see new markets begin to transition into flexible packaging. Keep in mind, however, that this does not need to mean a complete shift into a new package to replace their legacy packaging methodology. Instead, companies are exploring the use of flexible packaging to see what impact it can have on their sales and consumer preference. After all, packagers are not interested in the business of selling packaging, but if packaging helps them sell more of “what’s inside” that’s magic.

We are now also beginning to see a growing trend toward an increase in non-food, personal care, and over-the-counter products being introduced in a variety of flexible packaging solutions. The standup pouch is still leading the charge, but we are also seeing a variety of other innovative pouch formats being introduced.

Reduce logistics and transportation costs

As packagers start to drill down on their actual packaging costs today, they are becoming more cognizant of the impact of



Flexible pouch packaging is now being utilized to package, or re-package, a myriad of product applications including both dry and liquid products and virtually everything in between. Image Courtesy of ALLIEDFLEX Technologies, Inc.



The standup pouch is a popular format for non-food and personal care products. Image Courtesy of ALLIEDFLEX Technologies, Inc.

the “total” cost of logistics and transportation which can no longer be easily absorbed based on the rising cost of transportation, fuel surcharges, and labor. Flexible packaging can dramatically reduce transportation costs as compared to more traditional rigid packaging formats.

Facilitate recycling with mono-based barrier structures

The flexible packaging industry will continue to evolve and we will see a shift and transition away from laminated materials toward mono-based barrier structures which will better facilitate recycling and will make flexible pack-

Do you know the “real impact” of Rigid Container Packaging on Cost, Logistics, Transportation, Energy (Fuel) and the Environment?

One truckload
of flat pouches



often equals between 15-25 truckloads
of empty rigid containers



Flexible packaging can reduce transportation costs compared to traditional rigid packaging formats. Image Courtesy of ALLIEDFLEX Technologies, Inc.

aging even more desirable when compared to other traditional packaging formats which have been considered more recycle friendly or “circular.” However, please note that flexible packaging is already the greener choice in most

cases when compared to other more traditional alternative formats based upon Life Cycle Analysis (LCA). As a result, flexible packaging will continue to be well positioned as the inevitable packaging choice for the foreseeable future. ■

About the Author

Dennis Calamusa is President and CEO of ALLIEDFLEX® Technologies, Inc based in Sarasota, FL. Dennis has dedicated the past 30 years of his career to the commercialization of the Standup Pouch and other Flexible Packaging solutions in the North American market. Over his career and through his advocacy he led the charge toward a “re-packaging” movement in the food, beverage, household, and personal care industries which have brought thousands of new product introductions to market in innovative flexible packaging.



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Uniting suppliers with similar sustainability goals and experience can be your first advantageous move toward innovative packaging solutions.

HOW TO GET AHEAD OF PACKAGING CHALLENGES

COLLABORATION CURTAILS HESITANCY TO ADOPT SUSTAINABLE MATERIALS

By Thomas Morsheimer, Market Development Manager at Fresh-Lock® Closures

Compelled by consumer demand and anticipated legislation, the agenda for sustainable packaging is amplifying. Many businesses have already expanded their eco-friendly efforts by switching from rigid to flexible packaging to have a smaller carbon footprint, but this is just one step in the movement toward a circular economy. Retail giants like Walmart and Target, as well as other big names like Coca-Cola, have set goals to achieve sustainability standards for their owned brands by 2025. As members of the global community, high-profile brands know that their size and scale can drive change that ensures a better future for all.

While industry leaders in consumer packaged goods (CPGs) are setting the tone for sustainable alternatives, what is optimal for one application is not necessarily ideal for all. Therefore, it is imperative that each brand take a holistic view of sustainability. Any singular change is good, but your brand should continue to build on these efforts by getting ahead of challenges, setting new goals, and accelerating your ambitions. So, how can companies navigate their journey towards an eco-friendly footprint? Collaboration early and often is key. Uniting suppliers with similar sustainability goals and experience can be your first advantageous move toward creating innovative solutions.

Understanding the big picture

While it varies by need, flexible packaging consists of numerous features including closures, films, barriers, ink, finishes, and other potential add-ons. To have a functional package that meets (or exceeds) your expectations, every component needs to be compatible. Complementary combinations help reduce waste within the production process, maintain product quality, and delivers a good consumer experience.

To create packaging that works together, you should identify opportunities for improvement by looking at the initial stages of your operation. When considering each component of your package, ongoing collaboration between industry partners can help eliminate waste before starting production, which is why strategic partnerships are so powerful in the preliminary stages. Each facet of your package will face its own unique challenges, so your respective partners will need to fully understand your brand's goals and how you plan to get there.

While reevaluating your design and manufacturing capabilities, it is advisable that you start with the Waste Management Hierarchy. The hierarchy ranks waste management strategies from most to least environmentally preferred, placing an emphasis on reducing, reusing, recycling, and composting. While each method works toward the greater goal of sustainability, they each have a different purpose in supporting circularity. Suppliers that are familiar with the method you plan to pursue can give you a leg up on the journey towards sustainable packaging, especially if they have sustainability initiatives that you can benefit from.

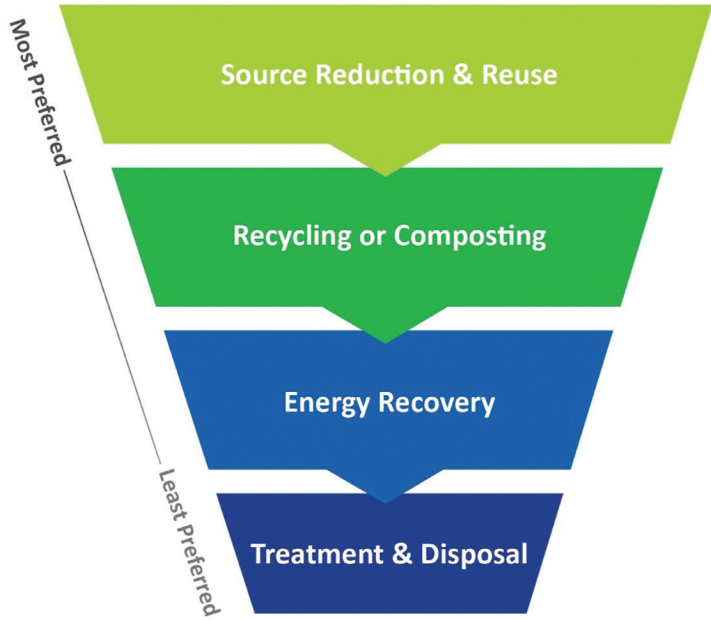
Getting started

If you are not certain which sustainability initiative your goals align with, look to your product. Recyclability has long dominated the conversation when it comes to making packaging more sustainable, but that does not mean it's right for all brands. Recycling often requires consumers to clean remnants from packages to avoid contaminating the recycling stream. This may be an impractical expectation for many types of products. Compostable solutions might be better suited to products that do not lend themselves to recyclability, but if your product is not soil safe you may have to think again. Some products may not fit in either category and should instead focus on source reduction and reuse. Brands also ought to consider their audience, and what aligns with how and where they are using the product and what infrastructure is available to help complete the package's lifecycle.

Mars Wrigley and Danimer Scientific, for example, teamed up to collaborate on biodegradable packaging for various Mars Wrigley brands. The two companies recognize that the impact of plastic littering is a major sustainability challenge. To help remedy this issue, they decided to head their partnership by focusing on Mars Wrigley's smaller, single packs that are more likely to be littered. A fantastic goal for makers of food and confectioneries, compostable packaging allows consumers to enjoy delicious, environmentally friendly treats.

When embarking on the journey to design a sustainable package, partners with the right expertise can help identify opportunities for improvement when it comes to your packaging operation. In allowing packaging engineers, suppliers, and printers to collaborate on your target, you can get specialized insight to determine the proper course of action while simultaneously avoiding unnecessary complications. There is no universal answer, which is why the movement towards sustainability requires innovative thought and action.

WASTE MANAGEMENT HIERARCHY



Waste Management Hierarchy, Image courtesy of Fresh-Lock® Closures



Fully recyclable Bear Naked® granola pouch, Image courtesy of Element

Embracing the change

Implementing sustainable solutions can seem arduous and costly. The groundwork for sustainable packaging is still being laid, typical eco-friendly materials may come at higher costs, and there's concern over potentially needing to replace equipment to be operational. Nonetheless, with prospective regulation on the horizon, businesses may want to make the investment in sustainability now to avoid getting fined or taxed in the future.

The shift is inevitable, so it's best to focus your attention on how your brand can get there efficiently. If your process involves running multi-materials, there may be immediate production challenges when switching to mono-material packaging. While trial and error to align the performance of your package with sustainable formats is expected, it can be made easier by working together. When your partners understand the fundamentals of your operation and sustainability goals, they can help identify unexpected alternatives, eco-friendly materials, ways to help eliminate waste, trouble-shoot challenges to help save time, energy and resources, and help you make smart infrastructure changes gradually.

In the case of Bear Naked® Granola's fully recyclable pouch, multiple teams came together—including Fresh-Lock, Berry Global, Dow, and ColorMasters—to create a sustainable packaging solution perfect for the product at hand. The result was not only approved by the Sustainable Packaging Coalition but also provided additional benefits like running at faster machine speeds and lower sealing temperatures, as well as having improved barrier requirements for enhanced shelf life. With each supplier specializing in a different

element of the packaging supply chain, the opportunity to combine their expertise and speak to the special capabilities of each component is what made room for innovation.

It is never too early, or too late, to kick off the conversation about sustainability with your partners. Brands around the world are announcing sustainable initiatives as consumers continue to demand change and favor those who offer eco-friendly options. To set your brand up for long term success, it is time to collaborate with your partners on how you can reduce waste and protect the planet. ■

About the Author

Thomas Morsheimern is the Market Development Manager at Fresh-Lock® Closures, and has over 20 years of experience in flexible packaging and closure technology.



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LABEL CODES ARE A POWERFUL SUSTAINABILITY TOOL

QR AND AR CODES ARE TRANSFORMING LABELING AND CUSTOMER EXPERIENCES

By Gary Paulin and Mark Lusky

Label codes such as QR Codes and Augmented Reality (AR) codes have transformed how (and how much) products are tracked, traced, reported about, identified, and talked about. Label codes are doing everything from providing up-to-date intel on the product's journey from manufacturer to consumer, to giving those consumers an entertaining, educational, and interactive way to become more engaged with the product.

Less obvious at first glance is the vital role codes play in the sustainability movement when it comes to informing, disclosing, educating, and entertaining consumers. Simply put, QR, AR, and other codes expand printed labels' terrain digitally, and enable the sharing of more information without the need for more label stock, ink, and adhesives—a benefit to the environment.

More about QR and AR codes...and contributions to customer retention

As technological capabilities of both advanced codes continue to expand, so will opportunities to go green in a paperless way. In addition, these codes are proving valuable to customer retention. Customers are increasingly taking advantage of what these codes offer to their buying journey, in turn driving loyalty and longevity.

QR codes are 2D barcodes able to store URLs. Websites on the other end of the link can include updated certifications, detailed usage directions, informative or fun videos, and more. They can enable interaction such as product registration or newsletter sign-up, provide instructions, detail recipes, offer fun facts, carry required compliance information, and provide inventory data.



Digital codes change the way products are identified and talked about, and engage people with entertaining stories

AR codes are QR codes on steroids, offering both 2D and 3D content, social media sharing options, and enhanced user experiences engaging customers at much deeper levels. Customers can see how products appear in the real world, and more often are buying products after experiencing AR with a smartphone camera or custom app that reads a label ID. Any product is eligible, from foods and beverages to health and beauty.

Back to sustainability

As the sustainability movement grows more expansive and pervasive, more product buying decisions will be influenced by consumer assessment of a company's "Sustainability Quotient." Influencers, in the forms of governments/regulators, advocacy groups, lobbyists, and industry representatives, will increasingly weigh in on the importance of preserving the planet and renewable energy choices.

So, the wise product manufacturer will balance the best and most important use of printed labels and placement of label codes opening up an entire digital world of information to a variety of audiences (including along the supply chain).

To do this in a way that fuels brand success, product manufacturers will commit themselves to a re-evaluation of their label and label code strategies, in much the same way as packaging materials, containers, and product components themselves will undergo a re-think.

For example, given the ability to use codes to extend information to the digital sphere, product manufacturers may want to re-evaluate use of more costly extended content labels—especially booklet style. An exception would be required additional product warnings or real-time use instructions—which also could be reiterated digitally. This repeated emphasis also can drive better customer engagement and loyalty.

Following are steps for product manufacturers to consider in future label and label code decision-making:

1. Contact your label provider for ideas and insights. Trend-setting digital label printers collaborate with their clients, offering

a variety of creative and compelling ways to achieve desired outcomes. In the case of wanting to become more sustainability-focused, these ideas can include ways to maximize brand impact while minimizing use of materials. There are many special effects to help accomplish this, and trends toward simpler, less busy labels can help the sustainability cause. Ability to advise and direct clients on how to best use codes as "off-site" additions to printed labels merits inclusion at a high level in the overall discussion.

- 2. Get clear on your digital strategy and tactics at the same time.** Offloading more in-depth information to digital platforms via scannable/clickable codes is a critical part of the equation. What is linked digitally merits considerable analysis as well. For example, a digital code connecting people to entertaining stories about the product is far different from "just the facts" information that helps inform. Consider such questions as: Do you want to connect customers to special offers with a strong call-to-action? Are you looking to provide feedback about product questions consumers have about a particular product, its sustainability quotient, and /or other issues? Do you want to dazzle 'em with pizzazz, via a highly-creative and polished presentation? Are you looking to have your digital platforms handle the lion's share of disclosures and core product information?
- 3. Look at where you want your sustainability philosophy and practices to evolve.** Some companies are embracing environmentally-friendly and renewable energy initiatives. Regardless of the breadth and depth of what your company decides, going-forward decisions merit being based on three principles: sincerity, transparency, continuous improvement. This is a path for product manufacturers that believe in the value of, and need for, sustainability—and are willing to make an ongoing commitment. (But, it should apply to anyone, no matter their sustainability commitment.) Intermittent, insincere stabs at "looking good"—often referred to as "greenwashing" in the environmental arena—are increasingly getting called out as phony tactics. It's better to stay true to core values and beliefs, no matter what they are.



QR Codes and AR codes have transformed how (and how much) products are tracked, traced, reported and identified.

At the end of the day, label coding—however it fits into a well-thought-out strategy—likely will play an ever-more-important role in the development and deployment of labels, and help drive the sustainability movement. ■

About the Authors

Gary Paulin is Vice President, Sales and Client Services at Lightning Labels, a Denver-based custom label printer that uses state-of-the-art printing technology to provide affordable, full-color custom labels and custom stickers of all shapes and sizes. Mark Lusky is president of Lusky Enterprises, Inc., a marketing communications and content development company. For more information, contact: sales@lightninglabels.com or visit www.lightninglabels.com.

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Block chain essentially creates a digital ledger of transactions that is duplicated and distributed across a network of participating computer systems. Image courtesy of METTLER TOLEDO

EMBRACING A DIGITAL FOOD SUPPLY CHAIN

INCOMING REGULATIONS AND STANDARDS ARE MAKING THE CASE PLAIN: FOOD MANUFACTURERS NEED TO PREPARE FOR A DIGITAL FOOD SUPPLY CHAIN. WHY NOT START NOW?

By Ian Scott-Mance, Technology Manager, METTLER TOLEDO

The early adopters are already out there. The arguments have been made and accepted, and those who codify regulations and standards are signalling their intent strongly: the food manufacturing industry must apply a digital transformation to the way it manages food safety and supply chain transparency.

There are benefits to be had for all through a realization of this transformation, yet right now, most food manufacturers are hesitant. In their hearts, they know that a move from manual track and trace to digital is coming. In their heads, there is a growing realization that it could be good for their business. In fact, with legislators and retailers starting to insist on digital transparency in the food supply chain, it is not an exaggeration to say it will be critical to the continued existence of every food manufacturer.

Many have nagging worries about cost and complexity. Many are

watching and waiting, assessing the technological trends, biding their time for the right wave to surf on. But there is no need for this to be either complex or expensive—the technology already exists. Food manufacturers must start preparing for digital transformation by looking inward—at their own systems and processes, and the data they can already harvest from them. The first step is efficient data collection, then this data must be shared throughout the supply chain. However, the latter cannot happen if the data does not exist in an accessible form.

Data collection

So data collection is the start point. It begins with the creation of a code for the very first article being introduced into the supply chain. At each transformative event along the way, from introduction of new ingredients, aggregation to de-aggregation, a new code is created and encrypted

which links to the previous code.

Even the smallest farmer can participate, by accurately weighing each batch of potatoes on industrial scales before a truck takes them away. Keeping that data (the weight and logistics information) in a database puts the farmer in a position to contribute to the digital transformation of the food supply chain. It potentially also allows the end customer to see the origin and, if the data is captured, the field from which they were harvested. Being able to trace the origin of these products could not only allow companies to act quicker when a contaminated food source is identified but could ultimately help save lives.

Early adopters

This concept of information sharing is critical to digital track and trace, enabling the identification of the whereabouts of specific batches of food at any given time in the past or present, in a matter of seconds. Digital food chain transparency has already been proven by early adopters to benefit food manufacturers in many different ways.

One such example is Golden State Foods (GSF), which has a manufacturing facility in Alabama producing over 160 million pounds of beef products per year. It supplies fresh beef patties to a network of quick service restaurants. The company has partnered with IBM to create a digital supply chain system based on blockchain technology, Radio Frequency Identification (RFID) and the Internet of Things (IoT). They say this approach makes customers “more confident in the food they eat.”

The project is the subject of a YouTube video, during which Guilda Javaheri, GSF’s Chief Technology Officer, explains, “It’s not just about digitizing your supply chain; it’s about reducing the hours of reconciliations that companies go through. It also optimizes the inventory throughout the supply chain. You are going to be able ultimately to have the right product at the right time and the right place. Can you imagine how much waste today can be prevented with that kind of information? That’s what makes this pilot unique—because manufacturers, distributors and customers are really sharing the data, and that’s really the common goal that everyone is striving towards.”

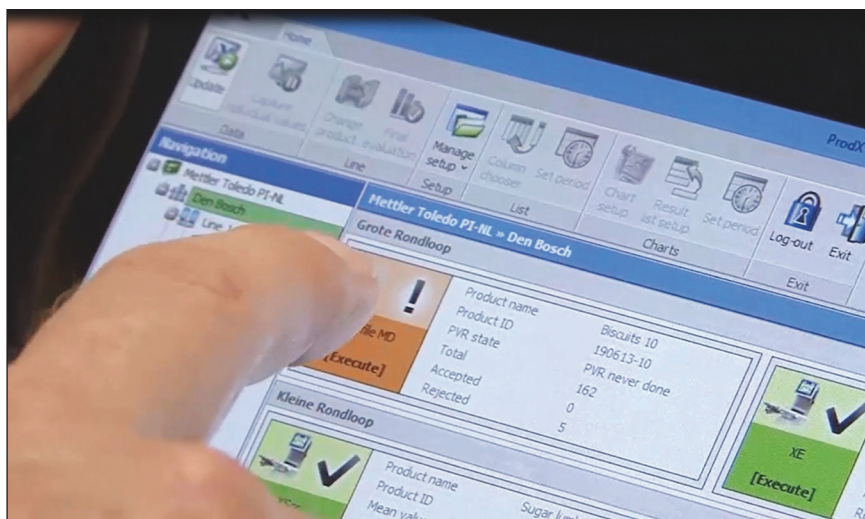
On another level is IBM’s partnership with the retail giant Walmart, which has seen the creation of a food traceability system, again based on blockchain technology. Data collection is now mandatory for all suppliers of fruit and vegetables to the retailer. In a proof-of-concept project, involving mangos sold in Walmart’s US stores, the time it took to trace the origin of the produce was reduced from around seven days to 2.2 seconds.

Importantly, the participation of suppliers in this project has not been an onerous one. As a 2020 article on The Leadership Network states, ‘the good news is, to benefit from the system, suppliers don’t have to be blockchain experts by any means; they just have to know how to upload data to the blockchain application.’

Blockchain explained

It is worth explaining a little about this technology, which has been the bedrock of digital food safety projects thus far. Blockchain is a chain of linked blocks of data records, each bearing a cryptographic hash of the previous block. Once data is recorded in a block, this then becomes part of the cryptographic hash in the next block, so data cannot be altered retroactively without changing all subsequent blocks that show that data. It essentially creates a digital ledger of transactions that is duplicated and distributed across a network of participating computer systems.

Unlike Bitcoin for example, which is a public-permissioned block-



Ultimately, digital transformation provides due diligence along the supply chain—from farm to fork—to deliver safe food to the consumer. Image courtesy of METTLER TOLEDO

chain, food safety blockchains would be private-permissioned, meaning that only authorized users can access the data, and they can only access the parts of the data that they are authorized for. The technology is considered secure and incorruptible.

Systems, devices and sensors that are capable of automated machine-to-machine communication can all be part of a blockchain system, and this includes food safety machines such as product inspection devices. Some of these are operating in exactly this way in the blockchain examples of IBM Food Trust.

The key point is that food manufacturers do not need blockchain specialists within their organizations. Manufacturers can tackle digital supply chain issues by learning how to use an intuitive blockchain application. The starting point is data: as long as it is collected and stored in a database, it can be retrieved and encrypted by a technology platform provider during an on-boarding process.

Starting steps

How should food manufacturers approach the need to start developing a digital food supply chain? There are a number of steps:

1. Start auditing the nature of the food transformation data gathered in the plant and investigate if the necessary data is being collected for digital track and trace at batch level.
2. Look strategically at how this data is collected and stored. Analogue technology must be replaced with digital technology. If possible, manual processes need to be automated; data held on local servers should be migrated to a data hub on the premises or to the Cloud.
3. Start talking to blockchain technology providers, to get a feel for the issues at stake and what can be achieved. IBM is currently the front runner here, but there are other potential providers. System suppliers such as those in product inspection can also help.
4. Consider how to oversee the cultural changes that implementing this digital transformation will require within the organization.

Many food manufacturers will find – perhaps to their surprise – that they are already in a good position to embark upon a process of transformation. The technology may seem complex, but its implementation is relatively straightforward. However, the change of culture will need to be carefully managed. Staff will need to understand and accept that within the blockchain, other organizations will have visibility of their company’s data. The transparency will be real and immutable. Leadership will be required to drive change and demonstrate commitment.

Getting in good shape

By starting to adopt a more strategic approach to planning for future digital transformation of the food supply chain as described above, food manufacturers can ensure they are in good shape to make the transition, cost-effectively and with minimal business disruption, at a point when it becomes either necessary or desirable.

The FDA's New Era of Smarter Food Safety, and the Global Food Safety Initiative's (GFSI) Race to the Top, make it profoundly clear that momentum for digital food track and trace is gathering speed. It is imperative that food manufacturers get ready. Waiting until an optimum moment – for example, when the balance of cost and value for the business tips definitively towards the latter – might prove to be a luxury never to be enjoyed.

The moment to assess and identify the commercial benefits from a digital supply chain, as early adopters have discovered, is now. Reduced waste and greater process efficiency might reasonably be expected from such developments, but less obvious gains might be just as attractive. For instance, the use of blockchain technology can serve to reduce the potential for contract disputes. Data will be recorded automatically and give an undisputable picture of when service level agreements have been met. The prospect of these "smart" contracts is likely to be of particular interest to retailers.

Insurance underwriters could use the data contained in the blockchain to reduce premiums, audit agencies might use it to reduce the frequency of onsite audits, and supply chain partners might see it as an effective way of monitoring contract packing companies.

Amidst the talk of blockchains and connectivity, of digital and data, it is easy to lose sight of what this technological transformation is all

about. It is about providing a system in which batches of food can be quickly tracked and traced, and in which critical actions taken by companies dealing with that food in the supply chain can be proven and trusted. Ultimately, it is about demonstrating that the necessary due diligence has been shown along the supply chain—from farm to fork—to deliver safe food to the consumer.

It is unavoidable that there will be disruption and cost to food manufacturers as the industry transitions to a digital supply chain. However, it also needs to be recognized that early entrants will gain commercially. A digital future is not just in the future, as the time to start counting and compiling, assessing, and progressing, is already here. ■

About the Author

Ian Scott-Mance is a Technology Manager at METTLER TOLEDO. For more information, visit www.mt.com/prodx-pr

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Bucket elevators provide smooth and reliable transportation of bulk materials. Image Courtesy of Ryson Bucket Elevators

WHY DEMAND IS GROWING FOR BUCKET ELEVATORS

CONTINUOUS BUCKET ELEVATORS DELIVER FAST, GENTLE MATERIAL HANDLING

By Owen Branigan, Account Manager at Ryson International, Inc.

Material handling is a pivotal aspect of packaging operations, and the market for bucket elevators is flourishing. In fact, industry analysts anticipate a compound annual growth rate of 5.7% for these conveyance systems through 2026.

Fast, gentle and precise material handling are key characteristics driving up demand for continuous bucket elevators, and a compact footprint, energy efficiency, durability and low maintenance costs make these systems appealing. The systems can be configured to transport products for just about any industry, and the primary growth markets are cement, food and beverage, pharmaceuticals, power and energy, paper and pulp and chemicals.

Bucket elevators combine vertical and horizontal product conveyance, and can be customized with bucket sizes to move between 300 and 1,800 cubic feet of product hourly. A few important questions to consider when selecting a bucket elevator are:

What are the most important capabilities to consider when selecting a bucket elevator?

Throughput, efficiency of product transport, and available footprint for the solution are all important considerations when selecting a bucket elevator.

How do bucket elevators impact the efficiency of packaging lines?

Bucket elevators can bring product to a different elevation safely and efficiently. Product is often manufactured and packaged in different parts of the plant, so bridging the gap between the two processes is often overlooked and quite challenging in an effort to not disrupt other operations. Systems can be configured vertically and horizontally to work within the existing footprint and operating environment.

What information is important to identify the right type of bucket elevator?

In respect to the bucket elevator, some of our most common “pain points” come from the characteristics of the product being handled. Product temperature, density, and even moisture levels play critical roles in the design of the bucket elevator and its ability to meet the needs of the customer. It is important to ensure the ability of product to “nest” properly in the bucket, to effectively leave the bucket at the discharge point, and we customize the bucket elevator to address unique customer needs and space constraints.

What’s the difference between a chain bucket elevator and a belt bucket elevator?

A chain bucket elevator is also known as a pendulum bucket elevator. Ryson’s design has a metal shaft on the two short sides of the bucket. They are not removable. It is a part of the bucket. This shaft sits inside of the chain roller. This allows gravity to always keep the buckets properly positioned no matter where they are in the bucket elevator. This method allows the end user to have more control over the product being transported.

What’s the difference between centrifugal and continuous bucket elevators?

A centrifugal elevator operates at high speeds and uses gravity and centrifugal force to essentially catapult material out of the buckets. These systems move product fast, but lack precision and overall process management controls.

A continuous bucket elevator is similar to a vertical conveyor belt, with buckets that pick up and transport products to a specific end-point where they are discharged. These systems provide gentle and precise material handling, and can be integrated into various existing production processes. While they aren’t as fast as centrifugal bucket elevators, they do move product quickly – and can transport between 300 and 1800 cubic feet of material per hour.

What are important considerations when choosing a bucket elevator?

Ryson’s pendulum bucket elevator is a continuous design, and is completely enclosed to prevent spillage and product contamination. Overlapping buckets are also efficient, and eliminate the need for the end user to index/pulse the product as it enters our infeed stations. This makes it possible to easily incorporate the bucket elevator into an existing product line, and reduces modifications to existing manufacturing processes. ■

About the Author

Owen Branigan began his career as a systems engineer, supporting integration of bucket elevators into existing production lines. See the bucket elevator in action on YouTube at <https://youtu.be/rwCGPajHHJM>, and learn more at www.ryson.com. Ryson International is part of Royal Apollo Group, a global leader in horizontal and vertical conveyance systems.



Ryson’s pendulum bucket elevator is a continuous design, and is completely enclosed to prevent spillage and product contamination. Image Courtesy of Ryson Bucket Elevators



Throughput, efficiency of product transport, and available footprint for the solution are all important considerations when selecting a bucket elevator. Image Courtesy of Ryson Bucket Elevators



Direct-to-consumer produce and fresh food deliveries make it a priority to monitor and report the temperature of products during the end-to-end journey.

EMERGING TRENDS IN FRESH FOOD PACKAGING AND DELIVERY

TECHNOLOGY TRACKS AND MEASURES TEMPERATURES THROUGHOUT THE PRODUCT JOURNEY

By Dan Bogar, Chief Revenue Officer at Varcode

The popularity of direct-to-consumer food deliveries, especially produce and other fresh foods, realized record industry growth in 2020, and it's a trend that shows every indication of continued double-digit growth for 2022 and beyond. One of the most interesting developments to emerge from this rapid expansion is the re-analysis of how optimized fresh food packaging can significantly improve providers' business performance – from greatly reduced customer churn to new package design standards that increase profitability. At the heart of this new trend in packaging is the quest to better understand the end-to-end journey of delivered fresh foods.

No fresh foods industry segment better represents this packaging challenge than direct-to-consumer meal kits. According to a recent university study, the majority of meal kits delivered to consumers contain one or more perishable food items that have been exposed to temperatures above the 40-degree Fahrenheit safety zone that impedes the growth of potentially harmful bacteria. The report indicates the meal kit industry needs to more accurately track and measure temperatures throughout the product journey to better understand how more strategic packaging directly impacts product quality, which in turn affects consumer confidence and better controls operational costs.

Research by North Carolina State University

Earlier this year, researchers at North Carolina State University evaluated 72 deliveries of identical menu items from 12 leading companies that deliver meal kits, ready-to-eat meals, or perishable foods via a delivery service such as FedEx. Key findings of the study include:

- More than 76 percent of the 72 boxes delivered included at least one product above the 40-degree Fahrenheit food safety zone.
- Nearly 42 percent of the companies had all deliveries above 40 degrees Fahrenheit.

- 50 percent of the companies shipped boxes with at least one protein product above 40 degrees Fahrenheit, and nearly 17 percent of those companies had all deliveries over 40 degrees Fahrenheit.
- More than 58 percent of the 12 companies shipped boxes with at least one fresh fruit or vegetable product above 40 degrees Fahrenheit. Of those companies, more than 41 percent had all packages arrive over 40 degrees Fahrenheit.

At issue is the fact that few details are known about the journey of these packaged fresh foods from when they leave the vendor to when the foods are delivered. Direct-to-consumer food companies are left in the dark, with no data and no control over their own products. If a fresh food product registered at 50 degrees Fahrenheit when delivered, we need to know how long it was above the recommended 40-degree safe zone. Knowing whether it was for 10 minutes, or more than four hours is important for determining food safety.

At present, there is no oversight or regulations, so consumers are left to trust the packaging design and shipping policies of the vendor and delivery companies, and, given the high temperatures noted in this research report, it appears there is considerable room for improvement.

Package design and coolants impact food safety

Researchers found that knowing more about the complete product journey uncovered new data on how the types and quantities of packaging coolants used significantly impact perishable food safety. Approximately 17 percent of deliveries using dry ice had at least one item above 40 degrees Fahrenheit. Of deliveries shipped using gel packs, 93 percent had at least one item above 40 degrees Fahrenheit. All the deliveries containing two kilograms or less of gel packets had at least one item above 40 degrees, and 90 percent of deliveries containing six kilograms or more

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of gel packets had at least one item above 40 degrees Fahrenheit.

More accurate end-to-end monitoring also enables companies to tailor their use of coolants and other packaging design components to adjust for seasonal changes, as well as geographic variables that require adjusting packaging strategies for differing climates around the world.

The impact of data-driven adjustments to fresh food packaging is immediate and far reaching. The right package design and coolants applied in the right environments easily reduce packaging costs by optimizing packaging designs and materials, decrease the need for re-deliveries, and cut back on fresh food waste, all of which ultimately increase revenues. For example, the average gel pack accounts for 15 percent of a shipment's cost of goods sold, not including the product plus the extra shipping weight. For a temperature-sensitive product typically sent via two-day shipping, each pound of that extra shipping weight adds anywhere from \$5 to \$10 per shipment, depending on the carrier and shipping rates. The key to predicting and managing these costs, of course, is having accurate, detailed box-by-box temperature data.

Packaging strategies impact customer retention

Improved packaging strategies based on accurate temperature monitoring also address another significant, industry-wide business challenge



Monitoring temperatures optimizes meal kit packing strategies.
Image courtesy of Varcode

– customer retention. Many food delivery companies report troubling levels of customer churn, and consumers say food safety is the main reason they choose, or change vendors. Accurate digitalized temperature monitoring enables companies to enhance packaging efficacy and earn customer confidence and loyalty. Emerging technology also enables companies and customers to confirm freshness of food deliveries instantly, and provides immediate feedback through customer satisfaction surveys and other dynamic content using mobile phones.

Research shows optimization of variable temperatures is a major factor impacting fresh food delivery, and packing strategies have the potential to ensure long-term growth in the direct-to-consumer segment. Box-by-box temperature monitoring is an accurate and affordable way to optimize packing strategies using detailed, scalable and actionable data. ■

About the Author

Dan Bogar is the Chief Revenue Officer at Varcode. Varcode specializes in wireless cold chain time and temperature monitoring solutions. For more information, visit www.varcode.com.



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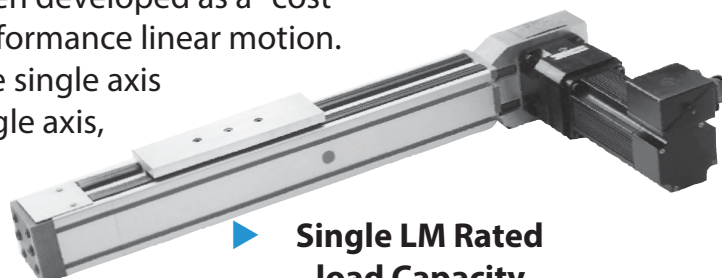
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