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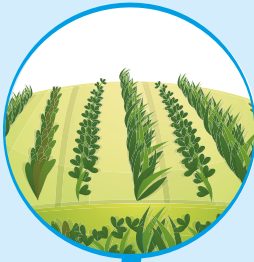
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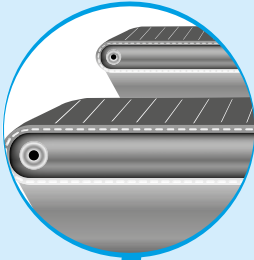
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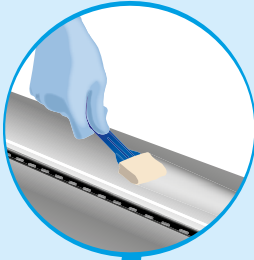
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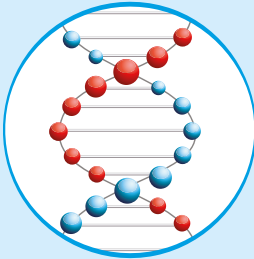
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From The Editor

The *Daily Show* with Trevor Noah has a new segment called "Ain't Nobody Got Time For That" for those days when there's too much news and too little time to cover everything in detail.

Here's "Ain't Nobody Got Time For That," food edition.

Walmart shared its results on using blockchain to digitally track products in the supply chain. The technology shows promise, essentially acting like a fast forward button to quickly identify contaminated products and remove them from the shelves. Walmart encourages the use of blockchain throughout industry.

Efficient traceability could have come in handy with the recent recall of frozen fish containing hepatitis A virus. Hilo Fish Co. conducted a voluntary recall for shipments of frozen imported yellowfin tuna steaks from Vietnam and yellowfin tuna cubes from the Philippines. It traced the products to its customers in California and Texas. Manufacturers where the frozen fish was imported have since modified their food safety procedures.

In regards to imports, May 30 marked the first major compliance date for importers covered by FSMA's FSVP, which states the same preventive standards apply to food consumed in the U.S., regardless of where it is produced. Importers are required to verify their foreign food suppliers meet FDA safety standards.

To claims of not being safe, in addition to not being nutritious or appetizing, BPI's beef trial with ABC Broadcasting started in early June. BPI will have to prove that ABC damaged the company's reputation by referring its "lean finely textured beef" product as "pink slime." This important \$5.7 billion lawsuit is expected to run approximately eight weeks.

Talking billions, the Trump Administration's Fiscal 2018 budget request proposes to slash FDA's budget from about \$2.76 billion to \$1.89 billion. AFDO is concerned, warning that cuts could dampen responses to foodborne illnesses, jeopardizing consumers while invalidating the efforts agencies have already made to reduce the cost of protecting the nation's food supply.

More news causing concern, particularly from those in the agriculture sector, is the U.S. withdrawal from the Paris climate agreement. Scientists say if left unchecked, climate change can produce longer droughts and more intense heat waves, causing big disruptions to agriculture and food production worldwide.

It's hard to keep up with the news of late, but all these stories have potentially important impacts. Keep informed on the news that not only affects your profession, but your daily life as well.

Marian Zboraj
 Editor





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The 2017 Life Science Award in 3D Printing will be presented to a graduate student from a U.S., Canadian or European university working on transformative advances in the areas of 3D Printing in life science, including biomedical, electronic and energy applications. The award will recognize cutting edge innovation in 3D printing applications and impactful advances in 3D printing tools.

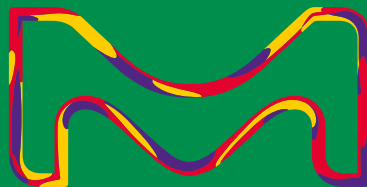

Graduate students who have completed or are expected to complete their program between 2016 and 2018 are invited to apply. Finalists will be invited to present their research to company leadership on October 18, 2017. The winner of the award will receive \$10,000 and each of the finalists who present their work at the event will be awarded \$1,500. Application deadline: August 4, 2017.

HOW TO

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- A curriculum vitae (CV) summarizing education, graduation date, work experience, all publications and external presentations, relevant skills and interests, and leadership activities.
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- A 300-word or less abstract for the presentation that will be given if chosen as an award finalist.
- A recommendation letter (1-3 pages) from your advisor discussing what makes you stand out and why you should be considered for this award.

**Finalists will be announced
by September 5, 2017.**



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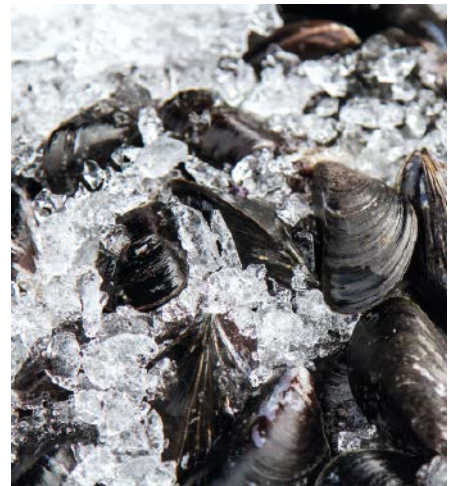
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NEWS & NOTES

In FDA News...

The FDA publishes three waivers to FSMA's Sanitary Transportation Rule of Human and Animal Food. The new ruling is intended to waive cases in which it would not be needed to protect foods from becoming unsafe. These waivers include businesses holding valid permits under the National Conference on Interstate Milk Shipments' Grade "A" Milk Safety Program. It also includes food establishments authorized by the regulatory authority to operate as receivers when food is delivered directly to consumers; and businesses transporting molluscan shellfish that are certified under the Interstate Shellfish Sanitation Conference's (ISSC) National Shellfish Sanitation Program in vehicles permitted under ISSC authority.

In addition, the agency acknowledges the Australian Department of Agriculture and Water Resources as a comparable food safety department after conducting a systems recognition review and assessment using the International Comparability Assessment Tool. This provides leverage to each country's science-based regulatory systems and a baseline level of public health protection that helps assure the safety of exported foods. Imports from Australia must now comply with U.S. statutory and regulatory requirements to ensure safety and proper labeling.



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Business Briefs

Bureau Veritas acquires **Schutter Groep B.V.**, provider of inspection, testing, and certification services to global agri-commodities markets, in order to expand Bureau Veritas' footprint in Europe, South America, and Asia.

Sealed Air enters into \$3.2 billion agreement to sell its Diversey Care division, and the food hygiene and cleaning business within its Food Care division, to **Bain Capital Private Equity**.

Fera Science Limited appoints **BioFront Technologies** as its U.S. agent for its proficiency testing service, Fapas, to enable American customers to order its proficiency testing samples directly from BioFront.

Fairbanks Scales partners with **Perten Instruments**, supplier of advanced analytical instruments to the agricultural industries, obtaining Nationwide Authorized Distributor Rights to sell Perten products.

Charles River Microbial Solutions partners with **Microbiologics** so its customers can use Microbiologics' capabilities to facilitate the preservation of their isolates into a customized quality control reagent kit.

Aquionics, provider of UV water disinfection technology, opens a new center in Charlotte, N.C., to improve sales, services, and technical support.

Barcoding Inc. partners with the online food ordering platform **Munch On** to provide hardware and software recommendations and ongoing support.

SGS partners with **Gluten Intolerance Group** to become first certification body approved to audit against the Gluten-Free Certification Organization standards covering all regions of the world.

Kezzler AS and **SGS** complete a strategic alliance agreement to co-market and execute serialization and tracking and tracing services for global SGS customers.

Thermo Fisher has been selected as a partner of **INTELLtrace Work Package**, part of the European **Food Integrity Project** aimed at developing a validation of untargeted methods to assure the quality, authenticity, and safety of the food chain.

United Fresh Publishes Recall Guide

The "Recall Resource Guide" by the United Fresh Produce Association has been published in an effort to assist the produce industry in developing preparations in the event of a recall. The guide supplies a general overview, outlining the importance of having a recall plan and the basic processes to establish one, with the utilization of available resources. The publication, developed at the request of the United Fresh Produce Association's Fresh-Cut Processor Board, is free for download for both members and non-members of United Fresh at www.unitedfresh.org/recall-ready-resource-guide.

'War on Sugar' Takes Toll Globally

The "war on sugar" being waged to combat public health emergencies like diabetes is slowing growth in global demand, which along with other factors could signal a fundamental shift in consumption ahead, as reported by Reuters. Falling consumption in more health-conscious markets has been exacerbated by higher prices and the use of alternatives like high-fructose corn syrup in developing countries that might otherwise have made up the shortfall. Combined with weaker demand from food and beverage makers globally, this could represent a fundamental shift in global consumption.



NASS Surveys Agriculture Industry for Census

Responses for the National Agricultural Statistics Service (NASS) 2017 Census of Agriculture are due by Feb. 5, 2018. This census, which takes place every five years, includes a complete count of U.S. farms and ranches to produce information which policymakers and local governments can use to create and fund agricultural programs and services. The survey is done electronically after those in the agriculture industry receive a letter through the mail. New to this year, NASS will also collect information on active duty and military veteran farmers, as well as expanded questions about food marketing practices.

U.S. Candymakers Reduce Calories

According to Reuters, five major chocolate and candy companies announced a joint commitment in May to reduce calories in many sweets sold on the U.S. market, a rare example of cooperation in a competitive industry. The U.S. FDA overhauled packaged foods labeling last year and required all manufacturers to list added sugars on labels by 2018. Mars Chocolate and Nestle, among others, said half of their individually wrapped products sold in U.S. will contain no more than 200 calories within the next five years.

Effects on Food Safety Performance in Chicken Slaughter

The USDA Economic Research Service recently released a report titled "Public Disclosure of Tests for *Salmonella*: The Effects on Food Safety Performance in Chicken Slaughter Establishments." In this report, researchers analyzed the impact of a USDA regulatory initiative that identified commercial chicken slaughter establishments with poor or mediocre ratings on *Salmonella* tests—specifically, how this has affected the outcome of subsequent tests. Download report at <https://www.ers.usda.gov/publications/>.

Consumers' High Expectations for Transparency

In "A Food Company's Guide to What Consumers Care About in the Age of Transparency," FoodLogiQ polled over 2,000 U.S. consumers to gauge their sentiment around food traceability and expectations for food companies regarding recalls and foodborne illness. The survey also posed questions around consumer preference for the identification of food sources with regard to labeling and menus. Key insights include: Over 50% of respondents expect companies to fully address a recall or foodborne illness within 1-2 days; if a brand/restaurant that consumers like experiences a recall leading to consumer sickness, nearly 25% of respondents admitted they would never use the brand or visit restaurant again; with regard to transparency in labeling, 54% of respondents want as much information as possible on the label, and nearly 40% want country of origin, allergen alerts, and GMOs all identified on the label. The survey is available at get.foodlogiq.com/food-traceability-consumer-survey.



Stopping Illegally Caught Fish

The Food and Agriculture Organization (FAO) of the United Nations has led the establishment of an internationally agreed upon standards to keep illegally caught fish out of the reach of consumers. A set of draft Voluntary Guidelines on Catch Documentation Schemes was unanimously adopted by a technical consultation, bringing an end to a 5-year negotiation effort, and are now balanced for adoption by FAO members at the U.N.'s bi-annual governing conference. The guidelines will act as a recognized "gold standard" for policymakers and organizations looking to establish systems to trace fish from capture to store shelves.

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Washington Report



The Single Food Safety Agency

Will the often-suggested proposal finally get traction?

BY TED AGRES

There is renewed interest in Washington behind the idea of creating a single federal agency responsible for overseeing all aspects of food safety. Such an agency would consolidate efforts currently performed by an inefficient patchwork of 16 separate federal government agencies, led by FDA and USDA's Food Safety Inspection Service (FSIS), which together administer at least 30 different laws relating to food safety and specific food commodities.

Adding to the overall complexity, the federal system is supplemented by more than 3,000 states, localities, tribes, and territories, many of which have their own laws and agencies to inspect facilities and investigate and contain illness outbreaks.

The idea for a single agency appears to be gaining attention following a comprehensive recommendation published earlier this year by the Government Accountability Office (GAO), the investigative arm of Congress; an endorsement for action by several Senate Democrats; and a

new study from Harvard University and the Vermont Law School that all urge creation of a national food strategy to address the nation's fragmented and inefficient food safety system.

Proponents of consolidation hope that the Trump administration, with its stated interests in reducing burdensome government regulations and improving efficiency, will be receptive to the idea, even though the effort is likely to face bureaucratic road bumps and perhaps cost more money than may be saved, at least in the short term.

Not a New Idea

"None of this is new," says David Acheson, MD, former associate FDA commissioner for foods and founder of The Acheson Group.

"For more than four decades, GAO has identified options for reducing this fragmentation as well as the overlap in food safety oversight, including establishing a single food safety agency, a food safety inspection agency, a data collection and

risk analysis center, [and] a coordination mechanism led by a central chair," Dr. Acheson explains.

In 2007, GAO added the federal oversight of food safety to its [list](#) of government areas "at high risk for fraud, waste, abuse, and mismanagement, or most in need of transformation." In addition to GAO's recommendations, consolidation proposals have surfaced over the years through [congressional legislation](#), a White House government [budget request](#), and reports issued by the [National Academy of Sciences](#), among others.

Thus far, however, little action has been taken.

While the single agency concept makes theoretical sense, there has been a notable reluctance on the part of federal officials to do much about it. Resistance, in part, has been driven by bureaucratic infighting and a lack of agreement on what exactly should be done, and by whom. Perhaps recognizing this, the latest recommendations from GAO and the universities focus instead on developing a national strategy for food safety oversight, which in turn, could lead to a consensus on how to proceed. "Absent a single agency, having a national strategy makes a lot of sense," Dr. Acheson adds.

The latest GAO report, "[Food Safety: A National Strategy Is Needed to Address Fragmentation in Federal Oversight](#)," released in January 2017, is perhaps the agency's most comprehensive analysis on the topic to date. Drawing from previous reports, it offers the following three examples of the "highly complex" current regulatory system.

1. FSIS oversees processed egg products, while FDA is responsible for eggs in their shells (shell eggs). USDA's Agricultural Marketing Service sets the quality and grade standards for shell eggs (such as Grade A), but USDA's Animal and Plant Health Inspection Service manages a program to ensure laying hens are free from *Salmonella* at birth. FDA, however, oversees the safety of the feed that hens eat.

2. FSIS inspects manufacturers of packaged open-face meat or poultry

sandwiches (those made with one slice of bread) while FDA inspects manufacturers of packaged closed-face meat or poultry sandwiches (those made with two slices of bread).

3. FDA has primary responsibility for regulating manufactured frozen pizzas made with cheese, but FSIS has primary responsibility for those made with meat or pepperoni. Multiple other federal agencies play roles in regulating other components of both types of pizza.

“Such distinctions are not only burdensome for food manufacturers, but also fail consumer interest,” said four U.S. senators in a February 2017 [letter](#) to President Donald Trump, in support of the GAO recommendations. The senators, Kirsten Gillibrand (D-NY), Richard Durbin (D-IL), Dianne Feinstein (D-CA), and Richard Blumenthal (D-CT), have previously sponsored legislation to improve food safety. Now they urged Trump to quickly begin implementing the GAO’s recommendations, asking him to work with Congress “to request any additional statutory authority or budgetary consideration” that may be needed.

While FDA, FSIS, and the White House Office of Management and Budget (OMB) have taken some steps to address fragmentation and improve interagency food safety coordination, more needs to be done, GAO said. For example, OMB has not addressed an earlier [recommendation](#) to develop a government-wide plan for the federal food safety oversight system.

To provide the framework for creating such a government-wide plan, in June 2016 GAO convened 19 food safety and government performance experts from industry and academia for a two-day meeting to identify and recommend steps to improve the overall system. These recommendations include the following.

- Evaluate and allocate federal government resources on the basis of reducing the risk of foodborne illnesses. This strategy should integrate federal, tribal, state, and local resources to coordinate and take advantage of what’s already being done at other levels of government and by industry.
- Manage risks consistently across commodities. Under the Food Safety Modernization Act (FSMA), the frequency and selection of FDA inspections are

largely risk-based, but federal laws governing FSIS require inspectors to be present at all times during animal slaughter and part of the time during processing. Changing the laws to align USDA’s inspection model with FDA’s “could benefit industry by reducing the resources companies expend for regulatory compliance rather than for managing risk,” the experts said.

- Consider as a long-term goal the consolidation of all food safety functions into a single new government agency. But because this is not feasible in the near-term, the experts suggested consolidating food safety functions within their respective agencies. For example, food safety within the Department of Health and Human Services (HHS) could be consolidated within FDA, or alternatively, in a new agency separate from FDA but still within HHS.
- Align and coordinate federal support from the various federal agencies to the states; improve the food safety information infrastructure, including how data are collected and shared; improve risk communication with the public; and invest in training and professional development for food safety officials.

Based on panel’s suggestions, GAO recommended that the Executive Office of the President, in consultation with other agencies and stakeholders, develops a defined national strategy, “establishes high-level sustained leadership, identifies resource requirements, monitors progress, and identifies short- and long-term actions to improve the food safety oversight system.”

Recommendations from Academia

In February 2017, the Center for Agriculture and Food Systems at the Vermont Law School and the Harvard Law School Food Law and Policy Clinic jointly released a 114-page [“Blueprint for a National Food Strategy.”](#) Similar to the GAO’s and other government studies, the report criticizes the “piecemeal policy and regulatory framework pertaining to food and agriculture,” noting that the U.S. food system “often works at cross-purposes, providing abundance while creating inefficiencies, and imposing unnecessary burdens on our economy, environment, and overall health.”

“Many federal policies, laws, and regulations guide and structure our food system,” states the report, which received funding from the W.K. Kellogg Foundation. “However, these laws are fragmented and sometimes inconsistent, hindering food system improvements.” Like the GAO report, the Vermont/Harvard study is process-oriented, focusing on *how* rather than on *what* to do.

Unlike the GAO and other government reports, the academic study adopts a noticeably egalitarian quality by advocating for substantial public engagement and transparency. The following four principles would guide the creation of a national food strategy.

1. Identify a lead office or agency within the federal government and give it sufficient resources and authority to compel engagement and action. An interagency working group would coordinate activities, and all efforts would include state, local, and tribal governments as key partners.

2. Create an advisory council made up of members of the public and key stakeholders from outside the federal government. Their needs and interests must be obtained and incorporated into the strategy.

3. Maintain transparency by providing information to the public on how laws and policies shape the food system; creating a written document that articulates goals and how they will be implemented and measured; and issuing regular progress reports.

4. Ensure the strategy is durable by publishing periodic updates that reflect changing social, economic, scientific, and technological factors.

“Using these mechanisms to coordinate laws, policies, information, and perspectives related to the food system can serve to lay the framework for an effective and urgently needed comprehensive national food strategy that promotes the needs and interests of all Americans,” the report concludes.

Government Response to GAO

As is typical with these reports, GAO invited HHS, USDA, and other agencies to review and comment on its recommendations. HHS declined to comment, and

(Continued on p. 19)

Innovative Tech



Carriers Cold and Clean

Getting up to speed on new tools, technologies, and training programs to facilitate compliance with FSMA transportation rules

BY LINDA L. LEAKE, MS

The days for spinning wheels are over. The time for full speed ahead with transportation food safety compliance is now.

Shippers and/or receivers employing 500 or more persons and motor carriers having \$27.5 million or more in annual receipts must now be in gear with the Food Safety Modernization Act (FSMA) Final Rule on Sanitary Transportation of Human and Animal Food, effective April 5, 2017.

The final FSMA Sanitary Transportation rule, issued April 5, 2016, requires

those who transport perishable food, be it by motor or rail, land or sea, to use sanitary practices to ensure the food's safety. According to FDA, the rule establishes requirements in four key areas: vehicles and transportation equipment, transportation operations, training, and records.

Perhaps second only to maneuvering a sharp mountain curve in an ice storm, meeting the FSMA training requirement is currently the scariest and most troublesome concern that transportation professionals are dealing with, according to John Ryan, PhD, a co-founder and principal of

Sanitary Cold Chain, Palm Bay, Fl. The company provides food safety training, audit, and, through its trademarked TransCert arm, certification support to carriers, shippers, and receivers in the supply chain.

Whole New Segment

While all other food industry stakeholders have been training their personnel for years, food safety training for the transportation industry has just recently become a whole new important segment of the food chain, Dr. Ryan says.

"Until the dawn of FSMA, the trucking industry has not been involved in food safety," he points out. "They concerned themselves with worker safety, focusing on how many hours one can drive safely. Now, to comply with FSMA, they have to develop food safety training."

Sanitary Cold Chain offers the training required by FSMA for all personnel engaged in transportation operations upon hiring and as needed thereafter. Along with webinars and in-person seminars, a third option is download packages companies can use with their employees.

Training certificates are available from Sanitary Cold Chain for completion of its three-hour course that highlights the three required topics, which include responsibilities of the carrier under the final rules (1 hour), awareness of potential food safety problems that may occur during food transportation (1 hour), and basic sanitary transportation practices to address those potential problems (1 hour).

"We help our clients start planning their transportation food safety programs by showing them how to develop a process and a flow chart," Dr. Ryan relates. "We help them to piece all the components of transportation food safety together and document them. The various steps in the flow charted process include shippers' product pick up spots, temperature monitoring and control, washing the truck, and the temperature of the wash water, among others. The bottom line

we stress is that you need to not just move food, but move it without contaminating it. You have to know the food safety rules for the specific products you are carrying and you must consider the potential hazards for them.”

All team members at John J. Jerue Truck Brokers, Satellite Beach, Fl., recently completed the aforementioned three-hour training course with Sanitary Cold Chain.

“The training was valuable to inform our staff and get them knowledgeable about FSMA and the changing food safety regulations,” says Michelle Renz, the branch’s office manager. “From new types of pallets to recordkeeping requirements, the new regulations will require everyone to consider details of their daily operations.

“The FSMA training gave us details into the blueprint for the processes and data that will affect the future of the trucking business, for large companies as well as small fleet owners,” Renz continues. “We are working with our stable of carriers so drivers understand the compliance regulations and can keep up with innovation in our industry.”

Since technology innovations are a major force disrupting the transportation industry, learning the details is what will set a good transportation planner apart from others, Renz emphasizes. “Each of our staff has completed training because the ability of carriers to adapt may determine their long-term business relationships,” she notes.

App User Manual

Sanitary Cold Chain has developed an app user manual for cell phones. “Drivers can enter data on washing, testing for food residue, loading, and unloading,” Dr. Ryan explains. “They can collect data on events at any time and place (such as during pickup, delivery, or washing), as well as monitor temperatures. They can also collect data for their personal FSMA rule compliance.”

This app user manual is available as a subscription service for both individual drivers and companies. “Each subscriber gets their own database in a cloud,” Dr. Ryan relates. “The reports available from the cloud collected data allow drivers and managers to manage their operations to the new food safety standards.”

Ready to Roll

What might arguably be called the coolest innovation to hit the highway to date is a composite reefer trailer now offered by Wabash National Corp., Lafayette, Ind.

The company’s new Cold Chain Series refrigerated van is constructed using a proprietary molded structural composite with thermal (MSCT) technology, which improves thermal performance by up to

25 percent and is as much as 20 percent lighter, while significantly improving puncture and damage resistance, according to Brent Yeagy, MS, MBA, Wabash National’s president and COO.

Molded structural composites have been used in aerospace, automotive, marine, and commercial construction for some time, and have previously been

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used by Wabash National in its refrigerated truck body. Yeagy says this is the first time the technology is being used in the trailer industry.

Wabash National's new trailer is manufactured with all-composite sides and top. The trailer's unique composite floor structure is 4.5 inches thick, while a conventional refrigerated van's floor is typically 7.75 inches thick. The floor is also available as a composite structure/aluminum surface hybrid.

The more newsworthy detail, Yeagy emphasizes, is that this innovative floor boasts a 50 percent increase in floor rating, which is how much fork lift load it can support.

"A standard reefer van floor is rated at 16,000 pounds and dry vans (those carrying dry goods, not refrigerated) are rated at 20,000 pounds," Yeagy relates. "This new floor has a 24,000-pound rating. No other reefer van on the road today is rated at 24,000 pounds. The key take home message is that the composite floor offers a 50 percent increase in floor rating, with a much thinner structure."

Introduced as a prototype in February 2016, the all-composite refrigerated trailer is now in a limited production run of some 100 units slated to be completed by September 2018.

Robert Lane, MBA, Wabash National's vice president of product engineering for Commercial Trailer Products, says that with the composite trailer being up to 2,000 pounds lighter than more commonplace refrigerated trailers, while owning the enviable 24,000-pound floor rating, refrigerated carriers can now double as a dry van when necessary.

"We achieved the weight savings by removing metal from the walls and floors," Lane explains. "The box is a one-piece composite structure made of glass, resin, and foam. There is no metal anywhere in the box structure itself, however the rails are still made of metal and the customer can specify an aluminum floor surface."

K&B Transportation, Sioux City, Iowa, accepted delivery of Wabash National's first MSCT refrigerated van in April 2017. Brock Ackerman, owner of the company, believes that the reefer's smooth interior wall promises to offer a real food safety

advantage for food haulers like himself. "With the smooth wall, there will be limited areas where bacteria can get into and hide within the trailer," he says. "That's a big plus, especially in light of the FSMA transportation requirements."

Telematics and Transport

If you're up on the buzzwords flying around in the fast-paced world where food transportation meets communications, you already know that telematics is the branch of information technology that deals with the long-distance transmission of computerized information.

Definitely an interdisciplinary field, telematics encompasses telecommunications, vehicular technologies, road transportation, road safety, electrical engineering, and computer science.

Definitely an interdisciplinary field, telematics encompasses telecommunications, vehicular technologies, road transportation, road safety, electrical engineering (including sensors, instrumentation, and wireless communications), and computer science.

Among its various capabilities, telematics can involve the integrated use of telecommunications and informatics, which is the science of processing data for storage and retrieval, for application in vehicles, and with control of vehicles on the move.

Telematics is critical for recording pertinent data to meet shippers' needs as well as for complying with the new FSMA sanitary transportation rules, says Gayatri Abbott, MBA, connected solutions product manager for Thermo King Corp. North America, Minneapolis, Minn.

"Recording, demonstrating, and retaining transportation temperature control data for 12 months is an important proof of compliance element required within FSMA," Abbott points out. "With a Thermo King telematics solution, carri-

ers can easily deliver proof-of-compliance data to their customers for any given point throughout their travels."

To that end, Thermo King's trademarked telematics offerings include the company's signature TracKing, an integrated solution that gives fleets real-time visibility of their refrigerated assets, allowing them to monitor critical cargo temperatures, trailer locations, and refrigeration units through the dispatch process from pickup to delivery.

"TracKing is a web-enabled system that provides fleet owners the tools to protect their assets, improve their response times, and manage their operating costs while maintaining the highest food safety and quality standards," Abbott relates. "With TracKing, shippers can monitor and control temperatures, track and trace shipments, and receive real-time notifications for time-sensitive events such as temperature changes, open doors, refrigeration system fuel levels, and battery life."

Available since January 2016, TempuTrak is Thermo King's temperature and location management tool for direct-drive trucks, heaters, and non-Thermo King refrigeration units that provides visibility of assets on the TracKing platform.

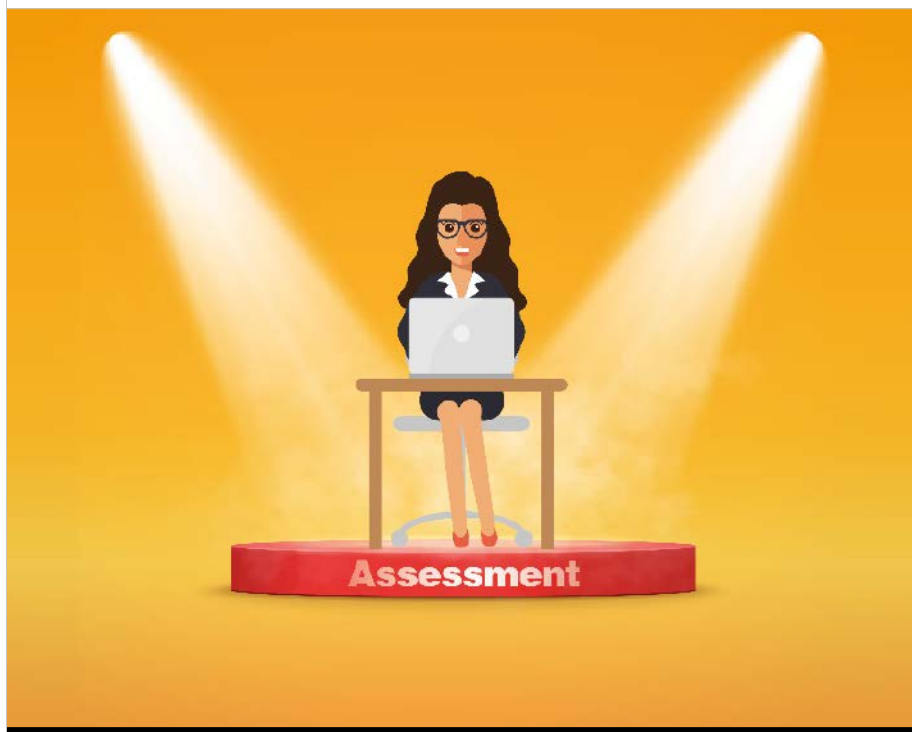
TrailerTrak, also on the market since January 2016, is a GPS-based trailer management solution for non-refrigerated trailers, tankers, and flatbed trailers that provides fleets with real-time and historical trailer status information, also on the TracKing platform.

Depending on the fleet's needs, Abbott says that Thermo King can provide services ranging from full visibility of temperature-sensitive cargo to basic tracking and tracing, or simple location monitoring 24/7 from a desktop, tablet, or smartphone. "The TracKing mobile app is compatible with both Google Android and Apple iOS devices," she notes. ■

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For bonus content, go to the June/July 2017 issue on www.FoodQualityandSafety.com and click on "Transportation Innovations that Adhere to Food Safety."

FSMA Update



Auditing Takes Center Stage in FSMA

The important role of audits and qualified auditors in a functional preventive controls system

BY WILLETTE M. CRAWFORD, PHD, MPH

In today's complex global supply chain and environment of ever-expanding market requirements, it has become common to rely on third-party audits to help assure the safety of one's supplies. Not only are food safety regulations driving this uptick, but retailers and other buyers are demanding it to reduce risk to consumer and brand value. Third-party audit schemes, such as those benchmarked by the Global Food Safety Initiative (GFSI), build confidence in the supply chain. Companies in compliance with such schemes have appropriate and comprehensive food safety controls in place to address hazards expected within

their operation and for their specific product type.

Third-party audits provide companies with an objective assessment of their programs and practices, enable them to identify opportunities for continuous improvement, and delineate gaps in their practices from industry best practices or regulatory requirements. Use of such audit schemes aid companies in minimizing food safety risks by ensuring implementation of the practices and programs necessary to reduce foodborne illness. A key factor in ensuring the integrity of scheme implementation and compliance is [auditor competence](#). An auditor's interpretation of food

safety audit standards is critical to ensuring the rigor of the audit scheme. Experienced auditors with the appropriate training and education provide objective and thorough assessments of the evidence gathered during the audit.

The Audit Era

The Food Safety Modernization Act (FSMA) emphasizes prevention and accountability across the supply chain to ensure the safety of foods consumed within the U.S., irrespective of where the food is produced. Seven regulations have been finalized and issued by the U.S. FDA as part of FSMA, four of which address auditing in some manner.

Specifically, the Preventive Controls for Human Food (PCHF) and Foreign Supplier Verification Program (FSVP) rules highlight the use of audits as an appropriate, and in some cases, a required supplier verification activity. These rules explicitly state that auditing must be conducted by a "qualified auditor" for those instances in which it is used as a supplier verification activity. Qualified auditors must have the technical expertise—obtained through education, training, experience, in any combination—to perform the auditing function as required. Audits may be conducted by the processor or FSVP importer, provided they employ individuals who meet FDA's definition of a qualified auditor.

Serious hazards that the processor or FSVP importer cannot mitigate through its own control measures may be identified as reasonably foreseeable for raw materials and ingredients. In such cases, annual on-site audits must be conducted to verify the adequacy of supplier controls to address the identified hazards. A hazard is considered "serious" where exposure to that hazard through food will result in serious adverse health consequences or death—i.e., hazards that would result in "Class I" recalls. In general, under these two rules, the processor or FSVP importer will determine appropriate verification activities based on the hazard of concern and the supplier's practices and food safety performance. For instance, appropriate verification activities may include audits conducted by a "qualified auditor," sampling and testing, or review of records and other related food

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safety documentation. Audits by third-party certification bodies can be used to achieve verification; such audits assess an operation's hazard analysis and implementation of preventive controls to ensure they meet the requirements of the regulations and are conducted by a "qualified auditor."

Third-Party Demand

The food industry has relied on private audits for years to ensure compliance with purchasing requirements. Given FSMA's supply chain provisions, reliance on third-party audits and the use of third-party auditors who meet the "qualified auditor" definition is likely to grow even more. The FDA refers to the use of private third-party audit schemes, such as the GFSI benchmarked schemes, to foster compliance with the Produce Safety Rule issued as part of FSMA. This is consistent with FDA's stated intention to work with the produce industry and other government and private partners to improve the rigor and reliability of private audits.

Under the FSMA Accredited Third-Party Certification Rule, the FDA now has the option of contracting with third-party certification bodies that meet its accreditation criteria to conduct audits on its behalf. These audits could either be regulatory audits of foreign facilities or consultative audits that assist companies in understanding gaps in practice that need to be addressed to come into compliance with the pertinent FSMA regulations. This is an important development, giving FDA the capacity now to cover

more of the regulated industry, particularly foreign suppliers, and enabling industry to utilize more tools to identify gaps in their practices before they undergo a regulatory audit or inspection.

Additionally, foreign suppliers may seek certification from accredited third-party certification bodies to establish their eligibility for participation in the Voluntary Qualified Importer Program, which offers expedited review and entry of food into the U.S. Third-party certification bodies and auditors may also be contracted to conduct assessments against certification criteria for cases in which high-risk food categories are offered for import. If the FDA has reason to be concerned about the safety of products from certain countries, territories, or regions with increased food safety risks, it now has the discretion under FSMA to require import certification as a condition of entry. Though this new authority has not been activated by FDA yet, it could be at any time, and could require the use of third-party audits or third-party certification bodies to conduct assessments per FDA's specific requirements.

Expectations

The passage and implementation of FSMA will have a significant influence on the use of audits and auditors. Private food safety audit schemes will likely modify their requirements to incorporate FSMA provisions. This has already begun with some GFSI benchmarked schemes, which have created tools to help stakeholders understand the gaps between their provisions and FSMA requirements, and understand how to use their provisions to achieve compliance with the FSMA regulations.

Given FDA's requirement to conduct audits in some cases for supply chain verification and its identification of audits as an appropriate supply chain verification activity, it would not be surprising to see the use of third-party audit schemes increase in the coming years. Moreover, FDA's ability to use third-party certification bodies and auditors to assess compliance of foreign suppliers and approval of accredited third-party certification bodies to conduct consultative audits for industry will probably result in growth of this practice and the auditing industry. While this is a positive development, it likely will not be without growing pains and complications, as third-party certification bodies and auditors, tasked with maintaining their objectivity and independence, interface with both FDA and its regulated industry. In addition, FDA's focus on ensuring that certain activities are performed by "qualified individuals," and that auditing is conducted by "qualified auditors," will undoubtedly increase focus on ensuring auditor competence.

FSMA underscores the role and importance of audits and "qualified auditors" in a functional preventive controls system. It remains to be seen how this will transform the private food safety audit industry; however, it is safe to say it will likely raise the bar for private auditing performance, given industry and FDA's reliance on this work for assessing and ensuring regulatory compliance. ■

Dr. Crawford, senior technical trainer for food safety at SCS Global Services, has over 14 years of experience in developing, implementing, and evaluating food safety systems across the supply chain. She also served as a food microbiology and produce safety expert for the development of FDA's FSMA regulations, policies, and programs. Reach her at wrcrawford@scsglobalservices.com.

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The Single Food ...

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USDA disagreed with many proposals, including the need for a national strategy. Should any major changes to the food safety system be considered, USDA called it “imperative” they be “data-driven, well-designed, collaborative, and, ulti-

mately, continue to enable the U.S. to have the safest food supply in the world.”

“It is a little disconcerting, but not totally surprising, that USDA felt a national strategy was not needed,” says Dr. Acheson. “Every food company has to manage food safety based on risk, FDA does the same, and FSMA clearly emphasizes that approach. USDA, on the other

hand, has never been too keen on adopting a clear risk-based approach. If the White House were to look at optimal ways to manage food safety resources, they would support the need for a risk-based national strategy,” he says. ■

Agres is an award-winning freelance writer based in Laurel, Md. Reach him at tedagres@yahoo.com.

NEWS & NOTES ...

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Maryland Joins California in Battling Antibiotic Overuse on Farms

As reported by Reuters, Maryland has become the second U.S. state to pass a law banning the routine use of antibiotics in healthy livestock and poultry, a move aimed at battling the rise of dangerous antibiotic-resistant bacteria known as “superbugs.”

Maryland’s Keep Antibiotics Effective Act, which aims to end a practice that public health experts say can fuel the spread of superbugs, takes effect on October 1 after

Governor Larry Hogan recently declined to sign or veto it. Farmers in Maryland have until Jan. 1, 2018, to comply with the law.

About 70 percent of antibiotics important for human medicine are sold for use in meat and dairy production. Researchers say overuse of such drugs diminishes their effectiveness in fighting disease in humans by contributing to antibiotic resistance.

California in 2015 adopted tough rules for antibiotic use on farms. Its law, which takes effect on January 1, also restricts the regular use of antibiotics for disease prevention and bans antibiotic use to fatten up animals.

The laws in Maryland and California go further than the U.S. FDA’s guidelines, which seek to prohibit the use of antibiotics for growth promotion in farm animals but do not address the routine use of antibiotics for disease prevention. The new state rules reserve antibiotic use solely for the treatment of sick animals or to control a verified disease outbreak, not for routine disease prevention, said Matthew Wellington, antibiotics program director for U.S. PIRG, which supported the Maryland legislation. Opponents included the Maryland Farm Bureau. ■

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The Attraction Behind Ugly Produce

Imperfect fruits and vegetables offer same taste and shelf-life as their cosmetically appealing brethren

BY LORI VALIGRA

They get no respect. Tomatoes, lemons, and other fruit and produce that may be undersized, a bit off-color, or have the odd bump or two. But are they really misfits or ugly if they offer the same nutrition, safety, smell, and taste but cost 30 percent less than their pretty relatives?

That's a question grocers and consumers alike are asking as they test this new food option. Ugly produce typically is thrown out, composted at the farm, or sold to wholesalers and restaurants that process it until its odd visage is gone. Consumers see ugly produce as a way to save money. Grocers see it as a way to make fresh fruit affordable to those who previously couldn't buy it, and help their company be a good corporate citizen, even join the zero food waste movement.

Indeed, market researcher Mintel of Chicago cited eliminating food waste as one of six key global food and drink trends for 2017. It includes using formerly ignored items like misfit produce. Both are part of a broader focus on sustainability. Joining Mintel, the Food & Agriculture Products Center, Stillwater, Okla., put using ugly produce to cut food waste in its top 10 food trends for 2017.

"More retailers, restaurants, and philanthropic organizations are addressing the sheer amount of food and drink that is wasted around the world, which is changing consumer perceptions," Mintel notes. "In 2017, the stigma associated with imperfect produce will begin to fade, more products will make use of ingredients that would have otherwise gone to waste, such as fruit snacks made from 'ugly' fruit and mayonnaise made from the liquid from packaged chickpeas, and food waste will be repurposed in new ways, such as power sources."

Ugly or pretty, produce still has to be safe for it to meet food safety standards so it can be sold to consumers, says Jennifer

McEntire, vice president of food safety and technology at United Fresh Produce Association, Washington, D.C.

"The ugly fruit movement is about visual appearance, not food safety," she says. "Any product that is potentially unsafe can't be sold."

The USDA's Agricultural Marketing Service administers the Perishable Agricultural Commodities Act, which specifies quality and grades fruit and vegetables to assure there is a standard for the produce and its price. That includes the size of tomatoes, so smaller tomatoes that still look pretty are typically resold to wholesalers, restaurants, or even as ugly fruit.

McEntire says her organization and the USDA hold joint inspection training programs that last a week and include hands-on training in assessing color and size, plus a laboratory component on how to evaluate produce. The programs are for anyone from the companies selling tomatoes to those purchasing them.

"As the saying goes, 'you can't judge a book by its cover.' The same is true for Misfits fruits and vegetables."

—JOHN GRIESENBRÖCK, Hy-Vee's vice president of produce/HealthMarkets

Ugly Lovers Emerge

An estimated 40 percent of food grown in this country ends up in the garbage, according to Natural Resources Defense Council figures cited by the ThinkProgress news website. American consumers toss out about 25 percent of the food they buy.

The publication says a lot of waste also happens between farms and grocery stores, which impose sometimes arbitrary cosmetic standards on produce, previously rendering it fit for the dumpster. But that's changing.

The effort to save and use the wallflower produce is thought to have taken off in Europe around 2014, notably by French retailer Intermarché, after the European Union declared 2014 to be the Year Against Food Waste. Intermarché, France's third-largest supermarket, made the initiative viral, launching an "inglorious fruits and vegetables" campaign to attract consumers to ugly fruit, including a YouTube video displaying misshapen fruits and vegetables in a way to make them attractive. Highlights include the grotesque apple, the ugly carrot, and the unfortunate clementine.

Advocates for ugly produce emerged in the past couple years as well in the U.S., including Californian Jordan Figueiredo. He decided to use social media to spread love for disfigured produce and runs the website EndFoodWaste.org and the Twitter handle @UglyFruitAndVeg, which now has 81,500 followers. It also offers recipes and tips on how to use the cast-offs.

But the bigger goal for his work and others embracing ugly fruit was to convince Walmart, Whole Foods, and other grocers to sell ugly fruits and vegetables. Doug Rauch, former president at Trader Joe's, also took up the charge and set up the Daily Table grocer in a poorer Boston neighborhood called Dorchester to sell, among other things, blemished food.

The ugly produce movement continues to gain followers. For example, Hy-Vee, West Des Moines, Iowa, an employee-owned corporation operating more than 240 retail stores across eight Midwestern states, partnered in January with Robinson Fresh, Eden

The Future of Ugly Food Looks Good

Full Harvest, which solves food waste at the farm level with technology, has closed a \$2 million seed round of financing led by Wireframe Ventures. BBG Ventures, Early Impact Ventures, Impact Engine, Radicle, and a collection of high-profile angel investors including Astia and Joanne Wilson also joined the round. Offering a business-to-business marketplace for the purchase and sale of surplus and imperfectly shaped produce, Full Harvest will use the investment to substantially grow its team and enhance its technology platform.

Full Harvest aims to turn the 20 billion pounds of produce that goes to waste each year due to surplus or cosmetic reasons into a new profit center for the industry—helping growers recapture the estimated \$10 billion market of lost produce sales while lowering costs for food and beverage companies, as well as consumers. Fruits and vegetables that would traditionally be wasted will be turned into a win-win for every player in the food supply chain.—*FQ&S*

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Prairie, Minn., one of the largest produce companies in the world that offers produce called Misfits.

“The beauty of this program is that the produce tastes the same and is of the same high quality, it just looks different. As the saying goes, ‘you can’t judge a book by its cover.’ The same is true for Misfits fruits and vegetables,” John Griesenbrock, Hy-Vee’s vice president of produce/HealthMarkets, said in a statement when the organization announced the program in January 2017. “As a company with several focused environmental efforts, we feel it’s our responsibility to help educate consumers and dispel any misperceptions about produce that is not cosmetically perfect.”

Hy-Vee quotes United Nations estimates that 20 to 40 percent of produce harvested each year is thrown away because it does not meet USDA sizing standards for store shelves. By selling Misfits, Hy-Vee is aligning with the USDA’s goal to reduce food waste by 50 percent by 2030.

Ugly produce did get a boost in early 2016 when TV’s “Shark Tank” venture capitalist Robert Herjavec gave \$100,000 for a 10 percent share in the ugly produce delivery company Hungry Harvest.

“We understand that there is product left in the field because farmers don’t think there’s a market for it,” Hunter Winton, Robinson Fresh general manager, added when the Hy-Vee agreement was announced. “With the Misfits program, farmers have an outlet to sell more produce and customers have an opportunity to save money and help reduce waste.”

Misfits Find Their Niche

Misfits produce is now available in almost all of the more than 240 Hy-Vee grocery stores. The product line has caught on in other regions, including in March at Hannaford Brothers of Scarborough, Maine, a Delhaize America company owned by Ahold Delhaize group of the Netherlands. The company has more than 180 stores in Maine, Massachusetts, New Hampshire, New York, and Vermont, but is starting Hannaford Misfits, in collaboration with Robinson Fresh, initially at 15 Maine stores.

“These aren’t culled products that aren’t otherwise sold in stores,” says Eric Blom, Hannaford spokesman. “We cull products one to four times a day to give bruised or discolored produce to food pantries. We donated 23 million pounds last year.

“Instead, Misfits is specific produce that otherwise wouldn’t be purchased,” he adds. “Supermarkets [typically] wouldn’t purchase fruit and vegetables that are nonstandard such as being misshapen, off-color, or smaller. Now we buy Misfits that are nonstandard and sold in addition to usual fruit.”

Hannaford did run a pilot project for Misfits first in Albany, N.Y., in collaboration with Robinson. The Misfits are sold in various-sized bags. Blom says the grocer has no demographic informa-



tion yet for purchasers, but others have said millennials are attracted to the concept of reducing food waste and using ugly fruit.

“We were one of the first in the United States to do it,” Blom says, adding that Whole Foods in California also was an early adopter. “We are a company that works hard to reduce food waste. About one third of our 181 stores [already] have zero food waste. And it’s a good option for customers because it costs 30 percent less.”

He says the Misfits have been popular, and the grocer is evaluating and learning more from it before it considers further rolling out the concept in more stores. “We hope [it] is successful and look to potentially expanding it to other stores,” Blom says.

Blom also explains that strict USDA food safety standards still apply.

“We don’t have any concerns about safety,” Blom says. “It has the same nutritional value as its more standard cousins, so the quality and safety are the same.”

Some people favor the standard-shaped products, as the ugly fruit can have scars, a carrot could split into two conjoined carrots, tomatoes may be slightly discolored, or two may be fused together. Others find beauty or even a profit in the

Others find beauty or even a profit in the cosmetic abnormalities.

cosmetic abnormalities.

The fused tomatoes, which are genetically mutated and known as “whoppers,” are especially popular with food service customers, says Jim Darroch, director of marketing at Backyard Farms, a Madison, Maine, hydroponic tomato grower. That’s because they are larger and easier to process into sandwiches or sauces.

Darroch says 45 percent of the company’s sales are to wholesalers, and 3 to 5 percent of its production has to be destroyed due to safety issues. It’s not selling ugly fruit yet, but Darroch adds Backyard Farms may at some time consider doing so. “People’s tastes are evolving and changing and we are keeping up with it,” he adds.

Community supported agriculture is succeeding with ugly fruit. With moniker “Delicious is not skin deep,” Ugly CSA is Pittsburgh’s first CSA for funky fruit. And The Ugly Apple Café food cart, Madison, Wis., uses local farmers’ overstock produce to minimize waste.

Good Price Leads to Shortages

When Walmart began selling ugly produce in mid-2016 under the “I’m Perfect” label, it found a ready market for low-priced bagged apples in about 300 of its Florida stores, but like even smaller grocers, found it difficult to get a steady supply of the ugly fruits and vegetables, according to CNBC.

While there may be plenty of imperfect apples one week, it may take weeks or months until there’s enough available from the next harvest.



Dana Gunders, a senior scientist in the food and agriculture program at the Natural Resources Defense Council, told CNBC at the time, “Selling cosmetically imperfect produce is relatively rare right now. Whole Foods has a pilot program, and there was a California chain, Raley’s, that tried it for a little while but discontinued it.” Raley’s has said it was reorganizing and the person spearheading the program moved on, according to Food Tank. There’s also been concern by grocers that consumers in general will shift to the cheaper produce, but Raley’s found that wasn’t the case.

Ugly produce did get a boost in early 2016 when TV’s “Shark Tank” venture capitalist Robert Herjavec gave \$100,000 for a 10 percent share in the ugly produce delivery company Hungry Harvest, Columbia, Md. It sells ugly fruit under the brand “Produce with Purpose,” and soon after the infusion of money it expanded quickly.

In August 2016 the company opened its first Produce in a SNAP site at Baltimore’s Franklin Square elementary school, which is in the middle of a food desert. Hungry Harvest CEO and co-founder Evan Lutz wrote the following in an April 2017 article for CNBC: “We sell 7- to 12-pound bags to residents that don’t otherwise have access to affordable produce, for just \$7. We also accept SNAP and EBT, hence ‘SNAP’ in the program’s name.”

He notes the program has since taken off, with over 3,000 bags sold and \$30,000 in revenue in the seven months since the program got started. Hungry Harvest plans to expand to two new sites per month.

Hannaford and others are examining early results of ugly produce to gauge customer reactions and whether they can get enough of a supply. But players like Hungry Harvest have found there is demand for such food, especially from people who normally don’t have access to fresh fruit and vegetables. And in the process, the ugly fruit industry hopes to become part of the solution to matching food insecurity with food waste. ■



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Safety & Sanitation

PEST CONTROL



Watch Out for These Three Summertime Pests

Infestations can rapidly set in during summer's prime conditions for the biggest pest threats—cockroaches, ants, and flies

BY ZIA SIDDIQI, PHD, BCE

Warm temperatures have arrived. Unfortunately, it also signals prime pest season.

Think: If you were a pest, where would you go? Pests can detect food at a distance and will aim straight for the source, which could very likely be inside of your food processing facility. Because many pests are tiny and can fit through small spaces, they can be incredibly difficult to keep out—you might not even realize when pests are hiding in the facility. But ahead of your next audit, you'll want to do everything to prevent and remove them so there aren't any surprises that take points off your score.

Most facilities are already employing an Integrated Pest Management (IPM) program to proactively help prevent pests from finding a way inside. If you haven't yet implemented an IPM program, then do so as soon as possible. IPM is a customizable, sustainable solution that focuses on prevention and exclusion tactics for pest management, using traditional treatments only as a last resort. Each IPM program is tailored to the individual facility, considering a variety of factors including region, surrounding environment, facility design, and more to create the most effective plan possible. Documentation is essential to IPM programs, serving as

a measure of success and marking the need for program changes to you and your pest management provider, which in turn demonstrates preventive control program and pest management efforts and progress to an auditor.

It's important that an IPM program is in place before summer, or you'll run the risk of an infestation. The three most likely pests to invade food processing facilities and cause a problem are cockroaches, ants, and flies. These pests pose the biggest threat to facilities, especially since infestations can set in rapidly during summer's prime conditions for pest activity.

Cockroaches

A year-round threat, cockroaches pose a unique challenge to food processing facilities. Over their multi-million-year history, cockroaches have become one of the most resilient creatures in the world. A notoriously hardy pest, they can sometimes find their way inside by hitchhiking on products or employees' personal belongings, although usually cockroaches come in directly from the outdoors. Vents, sewage pipes, and drain pipes are all potential points of entry.

Cockroaches are less likely to be spotted during business hours than some other pests because they're nocturnal pests, most often in hiding during the day. Cockroaches are known to hide when they sense danger as well, which can make them even more difficult to detect at times. When one is spotted, it is usually a good signal that more are present and hiding in the facility walls, basement, or other areas with less human traffic. A cockroach sighting could mean that it was forced out of hiding due to overcrowding, which is never something you want behind the scenes.

Known disease spreaders, cockroaches leave dangerous pathogens wherever they travel. They aren't picky eaters, so they frequently can be found around garbage and other organic waste. After mulling around and collecting mi-

microscopic particles on their legs and bodies, they can then transfer these particles onto products and equipment by simply walking over them. The [CDC notes](#) that cockroaches have been known carriers of *Salmonella typhimurium*, *Entamoeba histolytica*, and the poliomyelitis virus. Alongside the several dangerous diseases they can cause, their saliva, feces, and shedding body parts can also trigger allergy and asthma issues.

Rapid reproduction is another facet of cockroaches that makes them such a problem. There are many different species of cockroaches, and reproduction times differ slightly between them. However, the American cockroach (one of the most common) can lay eggs that will hatch approximately 15 cockroach nymphs in about a month.

Prevention is critical, so below are some actions to make positive changes today.

- Seal off any cracks and crevices on the exterior of the building. Use caulk or another water-resistant sealant to block off potential entryways. Cockroaches can flatten their bodies to fit through crevices, so seal any gaps you can find.
- Install automatic doors in primary entryways. Automatic doors decrease the window of opportunity that a cockroach has to enter the facility.
- Sanitize all equipment, eating areas, and other areas with exposed food and drink daily. Cockroaches are attracted to food particles, so cleaning spills immediately and sanitizing regularly can cut down on attractants that bring them indoors.
- Take out the trash daily and keep dumpsters at least 40 feet away from the building. Food and other organic waste are a big part of a cockroach's diet—keep it as far away from the facility as possible.
- Eliminate areas where moisture collects. Like any living organism, cockroaches need water to survive. Decreasing their access to a consistent water source will decrease the likelihood that they'll want to make a home inside your building.
- Have an incoming supply inspection program to prevent infestation coming with the shipments.

If you think that the facility might be dealing with a cockroach infestation, call a pest management professional. Usually, a few sightings in a month is evidence of a larger issue.

If not sure, the following are telltale signs of an infestation.

- Feces that look like coffee grounds or black pepper, especially in multitude, are a good indicator of a hidden cock-

roach population. Larger roaches expel cylindrical droppings.

- Many species, especially if they are reproducing and the colony has become quite large, emit an unpleasant oily or musty odor.
- Oval-shaped egg cases, called oothecae, can be found in dark hidden locations indicating American or

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(Continued from p. 25)

Oriental cockroach infestation. German cockroaches carry their ootheca until the eggs are ready to hatch. Examples of potential locations include behind equipment, under floor drains, and inside large appliances. If you see egg casings, it's time to act swiftly.

There are thousands of cockroach species across the globe, and each has its own unique characteristics. Some can fly, although luckily most are not strong fliers, while others are more likely to jump when disturbed. It can be difficult to correctly identify the species without the help of a pest management professional's expertise—if not properly identified, it will be nearly impossible to create the most appropriate, customized solution to a cockroach problem.

Ants

Like cockroaches, ants are a crawling pest that can fit through miniscule gaps in a building's exterior in search of food. They aren't known to spread diseases like cockroaches, but can compromise food products and hurt your bottom line in the event of product losses after they forcibly break in and steal food to eat or take back to the nest.

Their ability to use chemical trails to lead others in their colony to food sources is well documented, as is their ability to use pheromones to signal danger. These characteristics exist in most ant species, but what makes ants so tough to deal with is the diverse habits between different species. Noting where and how many ants you've found can be valuable information for a pest management professional. That being said, accurate identification, as with cockroach species, will still be diffi-



cult without the help of a properly trained pest provider.

Take the carpenter ant for instance. One of the more common species across the U.S., the carpenter ant makes its nest in wood and is often mistaken for a termite. Although they do not eat wood, they can establish themselves inside of a building structure and bore into exposed wood, especially if there are any areas where moisture is collecting. Carpenter ants will build satellite colonies separate

Pests can detect food at a distance and will aim straight for the source, which could very likely be inside of your food processing facility.

from the parent colony, so if you spot ants around wood shavings and areas of excavated wood, it's important to act quickly. While carpenter ants will live in wood primarily, they can still cost big points on an audit when they go out foraging for food. In addition, their tendency to destroy wood can be devastating to the longevity of a facility.

Ant prevention is similar to cockroach prevention, and shares some similarities with fly prevention as well. The same exclusion tactics used for cockroaches, like caulking any cracks and crevices on the outside of the facility, will work for ants. Don't forget to trim the trees and other vegetation that may touch the building exterior and provide access to the building. The only difference is that ants can fit through even smaller gaps, making it essential to pay closer attention to openings in the building's exterior. Regular sanitation and garbage removal will also help remove attractants that draw ants.

Flies

In terms of filthiness, flies are even worse than cockroaches—they're twice as filthy and are often nicknamed the microbial dispenser. They spend most of their time feeding on garbage and organic material,



and then will go straight from these areas to land on another food source. When they do so, they transfer thousands of potentially disease-spreading pathogens just like cockroaches.

One type of fly that is frequently overlooked is the drain fly, which is appropriately named after its tendency to feed and breed in drains where organic material has not been completely washed away. These little flies will look like gnats in the air and can move from drain to drain in a facility if the problem is not resolved quickly. Keeping drains clean and free of debris is the only way to keep them from making your facility their new home.

Like both cockroaches and ants, proper sanitation will eliminate many of the attractants that draw flies inside. It is important to install screens over windows and avoid leaving doors open for extended periods of time. Often flies get in by simply flying through the front door, especially if the building has a negative air pressure. Installing automatic doors, air curtains, maintaining positive air pressure, and fly lights can help greatly decrease the likelihood of a rogue fly finding its way inside of a facility.

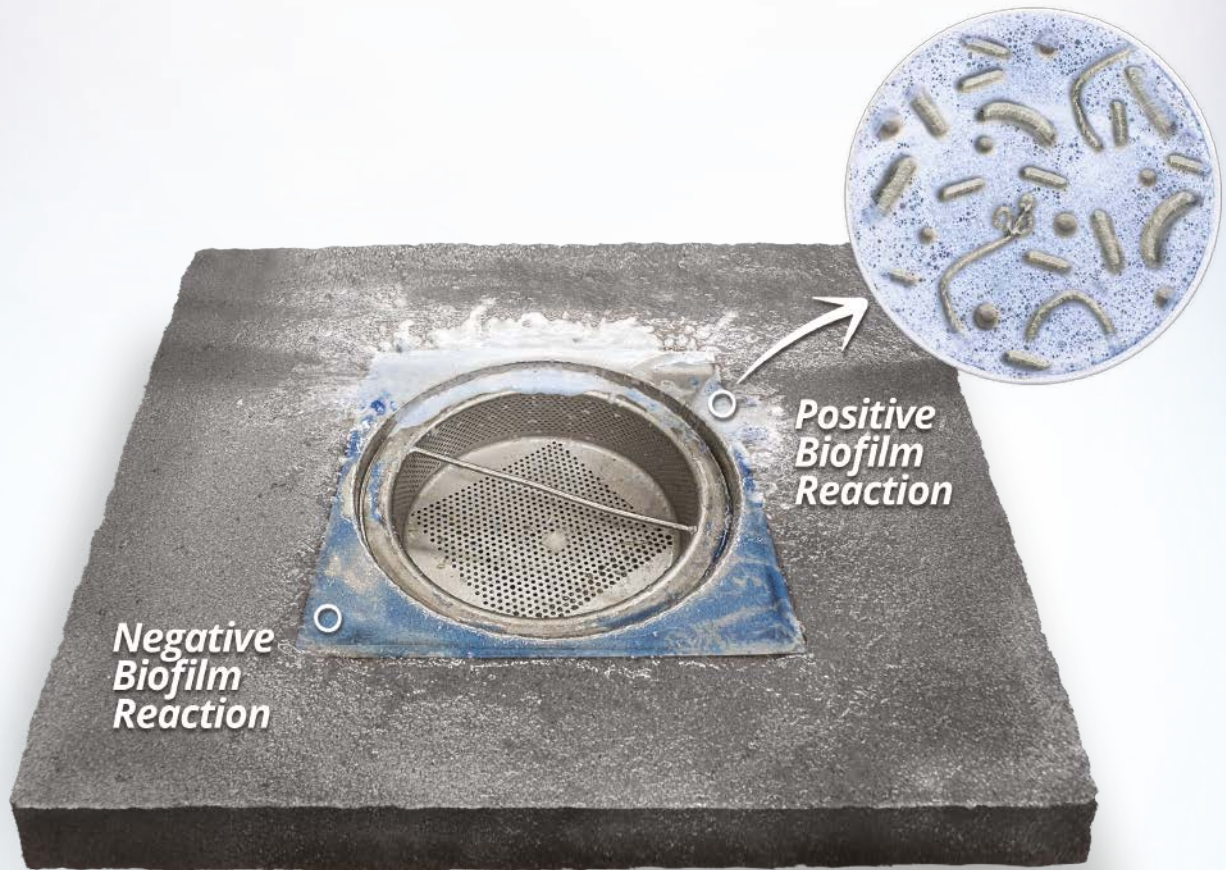
While all three of these pests have similar habits, and can be prevented using some of the same methods, each poses its own challenge to food processing facilities. Cleanliness and maintenance can make a huge difference in the battle against summer pests, but a full IPM program is the best way to make sure your facility is prepared for pests during the season they're most active. ■

Dr. Siddiqi, director of quality systems for Orkin, is a board-certified entomologist with more than 35 years in the industry. Reach him at zsiddiqi@orkin.com.



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Technician using electronic documentation to check bait station.

Does Your Pest Documentation Make the Grade?

Best practices in keeping service reports, pesticide usage logs, and pest logs current in a post-FSMA era

BY SHANE MCCOY

The QA manager at a large food processing facility spots signs of possible rodent activity—gnaw and rub marks on shipping pallets, and some droppings on the exterior of his facility—and lets the technician from his pest management provider know about it while the tech is performing his normal service visit.

Eager to satisfy the client and eliminate the problem, the technician installs two additional bait stations in the area where the activity was reported and continues his service visit.

Back in his truck, the technician completes his service report but, because the visit ran long, he is in a hurry and inadvertently forgets to record that he installed the

new stations. The service order is filed, the technician moves on, and the client does not immediately review the emailed service order because he has a budget meeting for which to prepare.

The seemingly harmless actions of the technician and QA manager could cost them both dearly if an auditor or government inspector notices stations that are not recorded in the pest logbook or marked on the facility map. It could result in the facility being written up or even failing an audit, which could be costly on several fronts.

The moral of this tale is that in today's business climate properly documenting all pest management and food safety related actions within a food processing

facility is a must and incidental oversight isn't an excuse.

Documentation has always been an important part of a food processing facility's operations, but now the Food Safety Modernization Act (FSMA) mandates documentation be even more organized, detailed, and accessible.

A food processing facility's documentation must produce the following trail of information for auditors and inspectors:

- Show that a pest management program is in place to intervene and eliminate pest threats;
- Describe the pest issue and what the response was to the issue;
- Document the effectiveness of the response; and
- Document that the risk to the facility has been mitigated.

The documentation provided by a pest management professional and the QA manager for the facility will be closely scrutinized by regulators and auditors. If there is a pest incident or failure, the documentation needs to show that the facility and its pest management partner did everything in their power to prevent it and that the failure has been acted upon and the desired results (i.e. pest elimination) achieved.

While pest management professionals are accountable for their work, food processing clients are ultimately responsible for the pest management program within their facilities. A big part of that responsibility is documentation.

Key Documentation Tools

Two of the most important elements in the documentation process are the logbook and the service order. These two items are the brushes that paint the picture of what is happening at a facility when it comes to pest management.

Logbook. A facility's logbook includes all the essential pieces of information that a QA or facility manager and their pest management vendor needs. It contains all applicable business and applicator licenses, certificates of insurance, and proof of training in Good Manufacturing Practices, food plant procedures, and FSMA.

The logbook should also include a materials list of what pest control products are approved for use in the facility. The prod-

uct's tradename, manufacturer, and EPA registration number, as well as product label and safety data sheet (SDS) would also be in the logbook. Keep the materials list current and have both the technician and client contact sign off on the list each time a product is added or removed.

Service order. The service order used to be a basic summary of what was done during that visit to the facility. The new FSMA mandates have changed all that.

No longer will simply scanning barcodes on bait stations or noting basic sanitation issues cut the mustard. The devil is in the details and today's service order must be heavy on the details.

Pest management technicians now include greater detail sharing who, what, where, when, and why of their service. They detail who they spoke with, what pest-conducive conditions were present, and what corrective actions were taken.

A good service order will always detail what product was used, how it was used (i.e. crack and crevice, spot treatment, bait station application, etc.), and where

Top 10 Documentation Infractions

When it comes to documentation, pest management professionals working with QA and facility managers need to remember three things: accuracy, consistency, and thoroughness.

If these three things are covered when compiling the required documentation for your facility, you will dramatically improve chances of successfully passing third-party audits and staying compliant with FSMA mandates.

What are the most common pest management documentation infractions? Review this list and see if your facility and pest management partner are making the grade when it comes to documentation.

1. Missing labels and SDSs
2. Missing business license
3. Missing technician licenses
4. Missing certificate of insurance
5. Not documenting pest conducive conditions
6. Missing or out-of-date device map
7. Missing temporary device map
8. Missing approved materials list
9. Missing annual facility assessment
10. Missing annual insect light trap bulb change dates

If your documentation is missing one or more of the above items, have a conversation with your pest management service provider to review documentation protocols and make sure they are capturing the data you need.—S.M.

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Audit Fails List

Having your facility successfully pass a third-party audit or government inspection is the most important work-related task a QA or plant manager has. If your facility fails an audit or inspection, it can result in production shutdowns, product recalls, fines and citations, not to mention damage to your brand(s) and lost revenue.

The British Retail Consortium (BRC), a food safety and quality certification program, audited more than 17,000 facilities and identified the most common reason for failure: documentation.

Almost 20% of facilities audited by the BRC had non-conformities in the documentation of cleaning procedures. What were the other infractions that caused audit failures? Below is the complete list of fails along with the percentage of plants with each deficiency.

1. Documentation of cleaning procedures (18%)

2. Properly maintained doors and docks (14%)

3. Processes for control of chemicals (12%)

4. Proper design and placement of equipment (12%)

5. Documented glass/brittle material handling (12%)

6. Adequate raw material identification (11%)

7. Proper wall maintenance (10%)

8. An up-to-date document control system (10%)

9. Properly maintained ceilings and overheads (9%)

10. Proper storage of finished goods (9%)

As the study showed, documentation is the most common deficiency leading to a failed audit. Having a well-organized documentation system will provide clients, auditors, or inspectors a clear view of where the pest management program stands at any time.—S.M.

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in the facility (i.e. a crack and crevice treatment in the shaker room corner) it was applied.

The comments section of today's service order allows facility managers to visualize the services provided and keep track of the progress of their overall pest management program.

Content Rules the Day

It is not enough to just capture data today. It is about capturing the right data. Data that will help predict pest trends and allow pest professionals and QA managers to develop a proactive response—is what really matters.

When pest control companies pull together documentation for a facility, technicians concentrate on the pest thresholds, pest vulnerable zone (PVZ) inspections, and corrective actions.

By collecting data in these three critical areas, pest control companies can accurately portray—often in real-time—the current condition of the facility's pest management program.

Pest thresholds. A strategic pest threshold paired with corresponding corrective action plans is the foundation of a proactive pest management plan. Collecting and monitoring data on pest thresholds identifies established action thresholds and provides a specific recommended response to a situation. If a threshold has been exceeded, the action plan provides a step-by-step game plan on how to react to the pest activity.

PVZ inspections. PVZs are areas in a facility that require additional inspection because of the likelihood of increased pest pressure. Pest pressures tend to be heightened in areas that have historically seen pests, such as those determined by trending reports, or areas

that are at a higher risk for infestations because of their business function, such as receiving and production areas. PVZs are barcoded in the area and scanned for verification while performing the inspection and, of course, all findings are documented.

Corrective action. If a pest-conducive condition (i.e. damaged door sweep or opening in the roof) or pest activity, like rodent droppings or fly larvae in a drain, is observed, corrective action must be taken by either the pest management vendor and/or the facility.

Documenting the corrective action that was taken accomplishes several tasks:

- It creates a “paper trail” for tracking who was responsible for carrying out the corrective action;
- It details what actions were taken and when; and
- It outlines the results of the corrective action, something auditors pay close attention to when completing their audits.

The Big Picture

Continuously documenting specific and prescriptive comments allows QA managers and pest professionals to conduct a deeper dive into the real reasons behind a pest threat.

Detailed documentation also helps create a level of transparency and accountability. Using the latest in handheld and digital technology (i.e. using a satellite map from Google Maps to identify where the bait stations are located) allows pest professionals to share information instantaneously with not only the local facility management, but also corporate QA contacts located across the country.

In the post-FSMA era, something that is not written down simply didn't happen in the eyes of an auditor, inspector, or the court. Establishing and following proactive documentation protocols will not only keep your facility compliant and improve efficiency in operations, it will also protect your brand and your bottom line. ■

McCoy, the director of quality and technical training at Wil-Kil Pest Control, a Copesan Pest Solutions Partner, is an Associated Certified Entomologist and has been in the structural pest management field since 1995. Reach him at smccoy@wil-kil.com.



Pest Management and Sanitation Compliance

Pest control guidelines specific to food facilities can help comply with FSMA's sanitation regulations

BY JIM FREDERICKS, PHD

Almost all the food consumed in America—from fruits and vegetables to meats and processed products—passes through the food industry before making it into the homes, and onto the plates, of families nationwide. This food can greatly impact the health and wellness of the American public, providing nutritional value as well as a gateway to foodborne illnesses when food processing and handling facilities are not properly maintained and sanitized.

One of the most prevalent, yet easily overlooked causes of food contamination is the presence of pests, such as rodents, cockroaches, and birds. Many pests are attracted to food processing and handling facilities as these environments provide everything pests need to thrive—food, water, and shelter. Pests not only carry harmful bacteria, *Salmonella* and *E. coli*, they can also contribute to food rotting and their mere presence can affect business profits and negatively impact reputation.

The implementation of a proper pest management program is essential to not only increasing the sanitation level of the facility, but also to adhering to the Food

Safety Modernization Act (FSMA) standards. If facilities do not have a proper pest management program in place, unsanitary conditions coupled with disease-carrying pests can cause widespread outbreaks and lead to severe consequences. These programs can be highly customized to meet the specific needs and pest concerns of a food facility. To help food facilities develop a comprehensive pest management program and comply with the sanitation regulations set forth by FSMA, the National Pest Management Association (NPMA) developed a guideline specific to food facilities.

NPMA Guidelines

NPMA has developed, and regularly updates, its own set of standards that specifically address pest management needs for food facilities. As food facilities each have their own unique set of pest concerns and requirements, it is absolutely essential that pest management programs are customized and continually maintained.

The NPMA standards serve as a tool or benchmark for what pest management

practices should be employed and what results should be achieved in food processing and handling facilities. The standards recommend an approach to pest management based largely on trends, inspection, and observation. Simply put, pest control professionals and food facility managers need to consider any past experience with pests, current pest problems, and areas of risk for potential future infestations.

A pest management program developed for food facilities should include a monthly interior and exterior property survey based on building maintenance, employee practices, incoming materials, and shipping as a way to identify pests and the potential for infestation. On the exterior of the facility, it's recommended to manage vegetation against the building to minimize risk for a pest infestation indoors. Vegetation and plant life need to be 18 inches from the foundation perimeter, grass should be cut low and bushes and shrubs should be closely trimmed to prevent hideouts for pests such as rodents.

The NPMA guidelines also offer insight into ways to survey, design, implement, and monitor for rodents, insects, birds, and wildlife that can be personalized for each food facility. As some food facilities will face issues with certain pests over others, it is key that pest control professionals understand the past pest problems experienced by food facilities in order to best prevent future pest behavior. In some situations where this historical knowledge of pest behavior is unavailable, the 2016 updated standards provides some baseline guidance on how to still develop a comprehensive program that will comply with FSMA regulations.

Not only do pest management programs need to adhere to FSMA, but some facilities also need to comply with specific food allergen control programs or the requirements of USDA organic. Pest management programs should take any and all programs and facility guidelines into consideration during program development. This need for personalized care and attention to pest management was more intensely expressed in the most recent version of the NPMA guidelines, published in late 2016.

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Integrated Pest Management

While establishing a pest management program may seem like a daunting task, it is very important to have a proactive plan in place to not only comply with FSMA, but to minimize contamination risk. An effective program will likely incorporate a customized integrated pest management (IPM) approach, which focuses on pest prevention by eliminating entry points and sources of food, water, and shelter for pests. An IPM program is a way to customize pest control for the various types of facilities handling food products each and every day.

As FSMA also continues to enforce new rules that address ongoing contamination concerns, food facilities need to be diligent in staying abreast of these updates to ensure they are following proper protocol. To help prevent foodborne illnesses spread by pests, it is essential to work with a pest management professional who can develop a customized IPM program. IPM programs are ideal methods

of pest control in food facilities as facility managers and pest management professionals work together in the identification of pest hot spots, proper sanitation practices, and pest prevention procedures, and implementation of technol-

...unsanitary conditions coupled with disease-carrying pests can cause widespread outbreaks and lead to severe consequences.

ogy advancements, as necessary. IPM programs need to be nurtured, checked on, and updated on a regular basis to ensure it meets the current pest concerns of the facility.

Each food facility will not only have its own unique risks for attracting pests, but they will also have their own specific

facility rules that pest management professionals must adhere to when servicing these sites. The use of IPM allows for pest management professionals to take site-specific circumstances into consideration and balance them against FSMA standards to develop a comprehensive program that will work to prevent pest problems and therefore food contamination. As pests are known to spread many foodborne illnesses, pest control is one of the most important aspects of the FSMA sanitation requirements and one of the best programs to put in place to help prevent food contamination.

Working with a pest management professional is the only way to ensure food processing and handling facilities are acting in accordance with the sanitation standards set forth by FSMA. This is a critical component of food safety programs in facilities nationwide, and one that can be easily overlooked. ■

Dr. Fredericks is chief entomologist and vice president of technical and regulatory affairs for the National Pest Management Association. Reach him at jfredericks@pestworld.org.

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Quality

LABELING



Standardizing Food Labels

Labeling was a vital element of creating safe products throughout the ages and can also be used today to ensure sustainability | BY JILL CARTE

Most consumers in North America—in fact, most of the world—have lived in an era in which the food they buy has some type of product label attached to it. This label goes beyond just identifying what the food item is; it also provides information as to its nutritional value, ingredients, and other important consumer notices. However, this has not always been the case.

For most of modern history, there were few to no labels on food. People produced much of their own food and purchased the rest from the farmer, the butcher, or the baker up the road, in which they knew the items were fresh and local. There were no government inspections or labels. The astute consumer knew what to look for in a piece of fruit or a slab of meat and could tell if it was fresh by poking it, smelling it, or simply looking at it.

And there were few “trust” issues when it came to selecting food. The farmer sold or bartered many of his offerings with the same person who made clothes for his family, taught his children in school, or built his farm equipment.

However, as the world’s population grew, much of this trust began to evaporate, and concerns about the purity, safety, and quality of food increased. These concerns are what led to a history of food rules and regulations, along with the food labeling systems that are in place today—all enacted to help protect the consumer.

A History of Food Labeling

One of the first examples of a labeling system, of sorts, regarding food quality, appeared around A.D. 400 in the Roman Empire. At that time, vendors would stand on the steps of a central location in the city to sell their goods. Those with the highest

quality of bread and other food products would stand on the highest steps. For the most part, this system worked. Consumers who could afford it knew to climb the steps for the highest quality food items.

Over the following centuries, rules and regulations were implemented to help ensure food was safe to eat. In the early 1200s, King John of England enacted the Assize of Bread. An assize was an ordinance or regulation, and this one stated that “upon every measure, bushel, weight, and upon every loaf, the name of the owner (i.e. maker) [be] distinctly written.” The attempt here was to inform the consumer as to who made the bread, and thereby help him or her determine if it was someone trustworthy. It also allowed the government to track down bakers who used inferior ingredients or marketed products that caused illness.

By the mid-1600s, Massachusetts, and later Virginia, adopted regulations very similar to the Assize of Bread. In time, they expanded labels to apply not just to flour and bread items but also to such things as meat and pork, wine, and especially butter. (At that time, butter was considered the most adulterated food product sold to consumers.)

Modern Food Labeling Regulations

What may be the most significant step forward in protecting the consumer and developing standards for food labeling in the U.S. is the Food, Drug, and Cosmetic Act passed in 1938. The statutes and regulations it put in place still impact the food labeling industry today. Among its provisions, many of which were novel and controversial at the time, included:

- A food product will be considered “misbranded” if its labeling is false or misleading in any way;
- The sale of one food under the name of another is prohibited;
- A food product will be considered misbranded if its container is made, formed, or filled in such a way as to mislead the consumer;
- The label must bear the name and place of business of the manufacturer or packer; and
- Information on the product label must be prominently displayed and easily readable by the consumer.

Today, with more and more food grown, produced, processed, distributed, and marketed all over the globe by millions of companies, the need for proper, understandable, and transparent food labeling continues to grow.

For example, according to a [January 2015 report on CNN](#), more than 500,000 food production and processing companies operate in China, and more than 70 percent of them have fewer than 10 employees. This makes it almost impossible to investigate all of these companies and ensure that the food is being prepared, processed, and handled properly. The labeling provided on many of these food items is often limited or incorrect. In fact, according to the CNN report, the quality control specialist AsiaInspection found that “48 percent of the ‘several thousand’ inspections, audits, and tests it conducted in China [in 2014] failed to meet the requirements stipulated by some of its clients”—many of which are Western food companies and retailers, such as McDonald’s, Starbucks, KFC, and Pizza Hut.

Sustainability and Cost Savings

In the U.S. and many parts of the Western world, there is growing concern about how much food is being wasted. Waste can no longer stand as the status quo in the 21st century. Steps are evolving to specifically address the issue of food waste.

It is estimated that more than \$161 billion worth of food is simply tossed away every year in the U.S. There have been some strategies developed in various American communities to address this waste of food, mainly in the form of donating unsold food from grocery stores to charities. However,

to make a real dent in this huge amount of waste, much more has to be done on a national scale.

In the realm of food donation, [Europe has taken a number of steps](#). In France, for instance, laws have been passed requiring grocery stores to donate unsold food items to various charities, while [Italy](#) and Germany now have tax incentives to encourage retailers, restaurants, and other businesses to donate food.

Germany has set a goal of reducing food waste by 50 percent by 2025. One not-for-profit restaurant there hopes to raise awareness of food waste by making dishes out of “[rejected food items](#).” Many of these rejected food items are rejected because they no longer look fresh enough for some retailers to market. However, in most cases, the food is perfectly edible.

In the U.S., it appears that one of the biggest reasons that so much food is wasted is not because the food doesn’t look as fresh as retailers would like but because the date on the food label confuses or, in some cases, misinforms the consumer. Even grocery store workers admit that these dates cause them confusion.

To be clear, the problem is not with an expiration date. Instead, it is phrases such as “sell by,” “best by,” or “use by” that cause the most confusion.

These phrases, says Dana Gunders, senior scientist, Natural Resources Defense Council, are “in need of some serious myth-busting because they’re leading us to waste money and throw out perfectly good food, along with all of the resources that went into growing it. [They] are poorly regulated and misinterpreted and lead to a false confidence in food safety.”

Today, with more and more food grown, produced, processed, distributed, and marketed all over the globe by millions of companies, the need for proper, understandable, and transparent food labeling continues to grow.

What these terms often refer to has nothing to do with the actual shelf life of the product or when the food item should no longer be marketed or sold. Instead, these printed dates often represent the food item’s peak freshness.

The USDA Food Safety and Inspection Service (FSIS) is now taking steps to address this confusion, hoping to reduce food waste and benefit the entire food manufacturing and processing industry by having standard terminology. FSIS was recently accepting comments about these proposed changes until mid-February. According to FSIS research, the phrase “best if used by” causes less confusion, and consumers view this phrase as an indicator of food quality rather than food safety.

“In an effort to reduce food loss and waste, these changes will give consumers clear and consistent information when it comes to date labeling on the food they buy,” says Al Almanza, USDA deputy under secretary for food safety. “This new guidance can help consumers save money and curb the amount of wholesome food going in the trash.”

Should these changes be adopted, restaurants, grocery stores, grab-and-go kiosks, and food manufacturers and processing companies will update their dating protocols. Labeling technologies are available to make the process relatively easy. Standardizing food labels to provide consistent information will help consumers feel safer about the quality of their food and help reduce waste. ■

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Navigating the Changing Landscape of Food Labels

Labeling software can help manufacturers design, print, and manage a vast number of labels to comply with various requirements | BY DOUGLAS NIEMEYER

Evolving industry regulations, requirements, and customer preferences continue to complicate food and beverage labeling. From complying with broad-sweeping reforms designed to better inform end consumers to preparing for pending regulations, it's more important than ever before for manufacturers to have an agile labeling environment to meet today's requirements and quickly respond to those that will be required in the future. And because the stakes are high—inaccurate labeling of a known allergen represents a serious health risk—these labeling environments need to rely on systems that minimize manual processes in favor of labeling accuracy. Here's a closer look at just a few of the labeling changes impacting food and beverage labels.

Allergens

According to FDA's 5th Annual Reportable Food Registry (May 2016), [undeclared](#)

[allergens topped the recall cause list](#), accounting for 47 percent of U.S. food recalls in FY15. In an effort to help consumers avoid the risks posed by food allergens, and to help manufacturers avoid recalls, Congress passed the Food Allergen Labeling and Consumer Protection Act (FALCPA). Before FALCPA, labels for food containing two or more ingredients were required to list all ingredients by their usual names. The issue was that some of the ingredients did not clearly identify their food source, making it extremely difficult for consumers to determine the presence of allergens.

Today, FALCPA requires that the *food source* names of all ingredients be prominently displayed if they are included in one of eight FALCPA defined major food allergen groups: milk, eggs, fish, crustacean shellfish, tree nuts, peanuts, wheat, and soy beans. Failure to follow FALCPA can result in life or death situations for consumers and damaging, costly recalls and

other legal issues for food and beverage manufacturers.

And the U.S. isn't the only country making significant changes that impact food and beverage labeling. The European Union (EU) recently passed regulation 1169/2011, which guarantees consumers' rights to adequate information by establishing general food labeling principles, requirements, and responsibilities for the foods they consume.

The regulation, which became mandatory on Dec. 13, 2016, mandates stylistic highlighting of the following 14 allergens when they appear in an ingredient list: molluscs, eggs, fish, peanuts, sulphur dioxide and sulphites, mustard, soybeans, milk, crustaceans, celery, lupin, sesame seeds, cereals containing gluten (wheat, rye, barley, oats, or their hybridized strains), and nuts (almonds, hazelnuts, walnuts, cashews, pecans, Brazil nuts, pistachios, macadamias, Queensland nuts).

How do food manufacturers stay ahead of mounting allergen regulations? One of the best ways to do so is by using a barcode labeling software that has the ability to tag or track allergens. For example, CODESOFT, a barcode labeling solution by TEKLYNX, includes a new "Tagged Texts Management" feature. The feature allows users to tag (bold) allergen words whenever they appear in an ingredient list. Once an allergen is tagged, it is automatically logged into a database so the same format can be applied to allergen data in multiple languages, ensuring food labels comply with requirements globally.

In addition to identifying allergens, barcode labeling software plays an important role in recall prevention because it increases label accuracy. The software itself significantly reduces the room for human error throughout the labeling process, increasing labeling accuracy and lessening the chance of a recall. And, should a recall be initiated, the software helps manufacturers identify the products labeled with specific lot numbers to more accurately pinpoint impacted products, reducing the time required to expedite the recall.

Industry-Specific Considerations

According to a recent Nielsen survey, 72 percent of beer drinkers think it's important to read nutritional labels when buying beverages. As a result, the Beer Institute

recently announced the Brewers' Voluntary Disclosure Initiative to add nutrition facts, an ingredients list, and freshness dating to beer bottle and can labels.

Jim McGreevy, president and CEO, Beer Institute, stated the following regarding the Brewers' Voluntary Disclosure Initiative in a [news article](#) on [www.wsls.com](#). "The Beer Institute, and its member companies, believes this is a step in the right direction to demonstrate a commitment to quality and transparency through these voluntary measures. Beer is the most popular alcohol beverage in the United States, and I look forward to brewers and importers including a serving facts statement along with disclosing all ingredients in their products. Providing meaningful information will ultimately empower the consumer when making decisions regarding the beer beverage of their choice."

Although compliance is not a legal requirement, the Beer Institute hopes the initiative will show commitment to quality and transparency and is encouraging participating brewers to achieve compliance by the year 2020. For beer manufacturers,

Once an allergen is tagged, it is automatically logged into a database so the same format can be applied to allergen data in multiple languages, ensuring food labels comply with requirements globally.

barcode labeling plays an important role in labeling compliance. Manufacturers should select a barcode labeling software that allows for both label data and content to be treated as variable because it lets them easily vary labeling elements based on product type or labeling regulation, and easily accommodates changes as new regulations emerge.

Produce is yet another industry in the midst of major labeling changes. First introduced in 2008, the Produce Traceability Initiative (PTI) is an industry-wide

Consumers Pay More for 'All-Natural' Labeled Foods

A recent study published in the *Journal of Food Science* found that expectations of product quality, nutritional content, and the amount of money consumers were willing to pay increased when consumers saw a product labeled "all-natural" as compared to the same product without the label.

Researchers at Ohio State University used virtual reality technology to simulate a grocery store taste-test of peanut butter. In one condition, consumers were asked by a server to evaluate identical products with only one being labeled all-natural. In the other, the server additionally emphasized the all-natural status of the one sample.

In the first condition, expectations of product quality and nutritional content increased, but there was dislike or non-willingness to pay additional for the all-natural product. However, expectations of product quality and nutritional content as well the amount of money subjects were willing to pay increased further when server identified one of the peanut butters as being made with all-natural ingredients. This result was observed across a diverse group of subjects indicating the broad impact of the all-natural label.—*FQ&S*

effort to make the food manufacturing supply chain more transparent and ease the process of handling produce recalls by using a standardized labeling approach. In 2013, urgency around PTI surged when Walmart announced it would require all suppliers to its U.S. stores to comply with the PTI. Today, the PTI is required by the majority of U.S. retailers. The primary labeling component of the PTI is a unique Voice Pick Code based on a combination of data points including the Global Trade Item Number, lot number, and pack date. This means it's critical to select barcode labeling software that features a built-in voice code formula to properly calculate unique Voice Pick Codes.

Broad-Sweeping Reform

Nutrition Facts. The U.S. government is calling attention to the link between diet and chronic diseases, such as obesity and heart disease, with the introduction of a new Nutrition Facts label. Aimed at helping consumers make better informed nutrition choices, the new label will be mandatory for manufacturers in the U.S. and those exporting goods into the U.S. as of July 26, 2018.

Nutrition Facts label changes include the following:

- Declaration of serving size that more accurately reflects the amount of food customarily consumed; expressed in a more understood household measure;
- Increased prominence of calories, servings per container and numeric values;

- Included amounts of added sugars; and
- New nutrients such as vitamin D and potassium will be required while others such as vitamins A and C will become optional.

FSMA. The FDA Food Safety Modernization Act (FSMA) was signed into law by President Obama on Jan. 4, 2011. It aims to ensure the U.S. food supply is safe by shifting the focus from responding to contamination to preventing it. One way to improve food safety is to reduce food recalls, with the majority of recalls being caused by misbranding. Such labeling errors, whether due to a missing or incomplete label, mislabeled ingredients, or failure to properly declare a required allergen, can not only be detrimental to food safety, but can also prove costly to companies.

FSMA is a major shift in focus from how food manufacturers, suppliers, and retailers respond to food contamination to how they prevent it as it gives the FDA mandatory recall authority and the ability to keep suspect food from being shipped. In addition, FSMA calls for increased preventive controls from food manufacturers and requires companies to either establish or enhance operations, plans, and procedures for preventing food safety issues, including product recalls.

EU Food Information for Consumers. The Food Information for Consumers regulation incorporates EU Regulation 1169/2011, which pertains to mandatory labeling changes for food items sold in

(Continued on p. 38)

(Continued from p. 37)

Europe, including imported food or food sold online to European vendors. The goal is to protect consumers' health by requiring labels that properly list allergens, are more legible and simple to understand, list origins of unprocessed meat, and provide thorough nutrition information on processed foods.

Nutrition information became a requirement on packaged foods as of Dec. 13, 2016, but a required format has yet to be determined. However, food and beverage manufacturers selling products to any EU country should expect to comply with a required format in the near future. A number of these formats are currently being tested with the use of color throughout the label to call out the healthfulness of a product. In fact, a three-month trial in [French supermarkets](#) revealed that a nutrition color system is likely to influence consumer purchasing behavior. As a result, France's Ministry of Health is encouraging manufacturers to use the new five-color nutrition label format based on a product's "Nutri-Score" to help consumers make better informed food choices.

With so many broad-sweeping reforms underway and more ahead, it's important to leverage a barcode labeling software solution that can accommodate both voluntary and mandatory requirements. For example, certain barcode label software can leverage database connections and variable data within the software's label design interface to easily print Nutrition Facts labels for dozens of products using one compliance label template. In addition to streamlining nutrition labels, label design software reduces the room for human error because it leverages existing data-

bases, automates variable data, and limits user permissions.

Other features can also meet labeling requirements. For example, TEKLYNX' CODESOFT offers VisualBasic (VB) Scripting—a tool that can be used to stop an incorrect print job. If text is not legible or does not exceed a minimum font size, VBScripting cancels the print job. It also allows for greater flexibility as advanced VBScripting lets users create tables that automatically identify and tag allergens in existing databases.

This means it's critical to select barcode labeling software that features a built-in voice code formula to properly calculate unique Voice Pick Codes.

What's Next in Food Labeling

Over 75 percent of processed foods found on U.S. grocery store shelves contain genetically engineered ingredients. This staggering percentage, along with growing consumer concern for such ingredients, led to U.S. bill S. 764, a federal standard mandating the labeling of foods containing genetically modified organisms (GMOs). The bill allows for different ways to include GMO information on food packaging, such as text or a symbol that identifies GMO ingredients, or a QR code that links to more information regarding the ingredients. In addition, short- and

long-term plans are in place for the FDA to introduce implementation policies for GMO labeling.

Another growing consumer concern relates to the "best by" date on food products. Printing this date is common practice in the U.S., but it's not required by law, which means companies can choose different standards to follow such as "sell-by," "best by," "use-by," and "best before." This difference in labeling language causes confusion among consumers and leads to increases in food waste.

To address this issue, bipartisan legislation was introduced in 2016 to standardize these dates. Known as the [Food Date Labeling Act](#), the act would require date stamps on all packaged food to follow a uniform system. The bill is heavily predicted to pass, meaning food manufacturers should have a food date labeling system in place to ensure compliance.

How does barcode labeling software play a role in helping food and beverage manufacturers comply with these regulations? The answer lies within the capabilities of the barcode labeling software itself. Companies should select a software that can easily generate QR codes, features variable field styling, rich text fields, and "What You See Is What You Get," or WYSIWYG, label design. All of these features improve the ability to build responsive, adaptable labeling environments.

Taking Action

Faced with an ever-changing list of labeling regulations and customer preferences, one thing remains clear for food and beverage manufacturers: They must equip themselves with dynamic labeling environments to efficiently and accurately meet these demands. A barcode labeling audit is a great starting point for companies. Its insights can help determine whether or not the company's labeling system, and ancillary support systems, is prepared to meet required labeling standards in the most efficient and accurate manner possible. Doing so will position food and beverage manufacturers for long-term labeling success. ■

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Menu Labeling Compliance Date Extended

The U.S. FDA has extended the compliance date for menu labeling requirements for restaurants and retailers from May 5, 2017 to May 7, 2018. This extension allows for further consideration of what opportunities there may be to reduce costs and enhance the flexibility of these requirements beyond those reflected in the interim final rule.

The FDA is exploring approaches to

reduce regulatory burden or increase flexibility related to:

- Calorie disclosure signage for self-service foods, including buffets and grab-and-go foods;
- Methods for providing calorie disclosure information other than on the menu itself; and
- Criteria for distinguishing between menus and other information presented to the consumer.—*FQ&S*

Winner Announcement Coming Soon

2017 Annual Food Quality & Safety Award

Find out who had all the right ingredients to be named this year's Food Quality & Safety Award winner. Watch this space and learn more at foodqualityandsafety.com/award.

This prestigious award honors the dedication and achievement of an organization that has made significant improvements in its safety and quality assurance program with a positive impact on business needs.



Manufacturing & Distribution

TEMPERATURE



- Unhealthy air conditions due to stagnant, stratified air—which harbors bacteria, molds, and viruses, as well as fumes from forklifts and other equipment.

HVAC alone is not enough to relieve these problems. What is needed is an effective air distribution system. By circulating air from top to bottom throughout the space, the temperature differential can be reduced to a minimum—along with the problems it causes.

One of the most cost-effective ways to address this issue is through the use of fans. Large, industrial sized high-volume low-speed (HVLS) ceiling fans in particular are especially effective at mixing air in large spaces in an energy-efficient manner, without causing uncomfortable drafts or spots that are too hot or cold.

Shutting the Door on Temperature Loss

Another problem faced by most food storage facilities is temperature loss during access to the structure. Warehouse doors and loading docks are typically quite large and allow correspondingly large amounts of air in and out when they are opened. This can lead to frustration when trying to maintain a stable temperature within the building while transporting goods and materials in and out of the structure.

The challenge is to design doorways to enable easy access for both people and goods while minimizing air exchange. Door design plays a critical role in this endeavor. Ideal door design depends on many factors, including location in the building, the equipment to be used, desired temperatures and temperature differentials, and how often the door will be used throughout the day. Effective designs range from heavily insulated cooler doors to high-speed doors, or even vinyl curtains.

Another strategy that can be very effective, especially where a high degree of access and mobility is desired, is to divide two air spaces with air itself through the

Getting Control Over Your Facility's Temperature

Solutions to common temperature challenges in large food manufacturing and warehousing facilities that can help minimize product loss | BY **BILL CARLSON**

Food safety and temperature go hand in hand. It takes only a few degrees difference in temperature to cause spoilage—whether it be from bacterial growth due to warm conditions or frost damage due to cold. Temperature also affects humidity, which can wreak havoc on both packaging and on food itself.

Maintaining proper food storage temperature and humidity can be challenging enough in a home, restaurant, or retail setting. However, in large manufacturing and warehousing facilities, the challenges are compounded by storage and access issues as well as the sheer volume of space involved.

Air Stratification and Distribution

One of the biggest issues in warehouse temperature control is caused simply by the nature of the buildings involved. Many of these facilities are thousands of square feet large with 20- to 30-foot high ceilings. Wherever you have a large, high-ceilinged space, air tends to stratify. Warmer air rises and cooler air settles, resulting in horizontal layers of air with differing temperatures. This can pose a number of problems, including:

- Difficulty maintaining consistent storage temperatures;
- The formation of cold downdrafts and/or chimney effect, which can adversely affect workers; and

use of an air curtain. This consists of one or more blower fans positioned above the opening between two spaces, which directs a stream of air downward. The air current effectively separates the two spaces without impeding entry and exit. This works best when there is little pressure differential between the two spaces.

While specialized air curtains or air doors are commercially available for doorways, it is also possible to create an air curtain effect across a larger space by installing a line of small HVLS fans across the ceiling.

Humidity Control

Temperature and humidity are closely related, and any attempts to control temperature in a warehouse situation are sure to affect humidity levels as well. While improper humidity levels can adversely affect any product, maintaining proper humidity levels is especially critical where food storage and handling take place. High humidity can encourage mold growth and degrade the quality of many food items. It can also compromise food packaging. Conversely, some food products, like fresh produce, require high-humidity levels to maintain optimal freshness.

Where two adjacent spaces must be kept at different humidity levels, the most common solution is to use an insulated barrier wall or fabric curtain wall, along with mechanical humidity control devices such as chillers, humidifiers, and/or dehumidifying units.

On the other hand, in a large space, it's quite common for humidity levels simply to rise too high. Overly humid air is an especially common problem in food packaging facilities where hot water is used in cooling and sterilization procedures. In this case, it might be necessary to install a large-scale industrial dehumidifying unit or system.

There are numerous types of industrial scale dehumidifiers available on the market. Some use chemical desiccants to remove moisture from the air. Others, such as DX systems and heat pipes, work in conjunction with the air conditioning system. Each system has its pros and cons in terms of cost, energy efficiency, and capacity.

Another approach that can be used on its own or in conjunction with an air-conditioning system is evaporation. This ap-

proach uses fans to create air movement that moves humid air away from the area. It also creates an evaporative cooling effect that can reduce worker stress. This is especially true of HVLS fans, which operate without creating undue drafts.

Avoiding Condensation

Condensation is, of course, a humidity issue. However, it is also a temperature issue. Condensation happens when warmer air flows over a cooler surface. If the surface is cool enough, the air will hit the dew point and coalesce into droplets, which then collect on the surface. It's possible to have condensation even without overly high humidity, where temperature differentials are great enough. That said, high humidity exacerbates the problem.

Condensation is a common problem in warehouses, especially at humid times of year. It can contribute to all sorts of safety issues, such as sweating slab syndrome

By circulating air from top to bottom throughout the space, the temperature differential can be reduced to a minimum – along with the problems it causes.

and slippery handrails, as well as compromising product quality. Because of the huge temperature differentials involved when coolers and freezers come into contact with warmer air, condensation is also a very common and serious issue when it comes to food storage.

There are two ways to fight condensation: reduce humidity or decrease temperature differential. The latter isn't always possible in a food handling situation, since coolers and freezers by their very nature require a temperature differential. However, in certain cases, it is an effective approach. For instance, correcting air stratification problems in a large warehouse space can relieve condensation issues by creating a more uniform interior

air mass as well as through the evaporative effect of moving air.

Cost Control

One of the biggest temperature control challenges for large food handling facilities and food storage warehouses is maintaining safe temperatures cost effectively. Implementing energy-efficiency measures can significantly reduce costly energy loss, but care must be taken to allocate resources on high ROI improvements. Considerations include the following.

Energy-efficient lighting. LED bulbs are the most efficient available, and their long life reduces maintenance costs significantly. They emit very little heat and therefore reduce cooling costs, and are cold-tolerant for efficient lighting for freezers and coolers. However, high-efficiency fluorescents usually cost less upfront and may be more cost effective, so it's a good idea to run the numbers before investing in lighting.

Shell measures. Limiting energy loss through the building's walls with measures such as insulation, weatherization, energy-efficient doors and docks, and cool roofs will significantly reduce HVAC costs. It will also allow cooling equipment to run less, which saves electricity and extends equipment life.

Pipe insulation. Older cold storage facilities should be examined for uninsulated or poorly insulated piping. Insulating just 400 feet of pipe can save a facility \$27,000 per year, according to the Global Cold Chain Alliance.

Automation. Smart building technology automatically adjusts controls for maximum energy efficiency and allows warehouse HVAC and food storage units to be controlled remotely, saving on labor costs as well. When purchasing fans and other equipment, look for units that can be tied into an automated control system.

Finally, it's important to remember that high-tech solutions aren't always the most cost effective. Sometimes a solution as simple as installing a ceiling fan can alleviate temperature and humidity problems just as well or better than fancy HVAC equipment. ■

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Shedding Light on LEDs

The efficiency, light quality, and durability of LEDs translate to the realm of food safety | BY JAMISON STOIKE

Avoiding spoilage, bacterial growth, and contamination are a foremost concerns of food safety. However, there are ways to improve the quality and safety of food that may not be as immediately apparent as properly washing and sanitizing equipment. High-quality lighting—made possible on a large scale with the rise of LED technology—improves food safety in a number of ways during the journey from farm to table.

Over the past decade, LED lighting has transitioned from an expensive fringe-player in the realm of industrial and commercial lighting into the ideal choice for efficiency- and safety-minded companies. Rapid advancements in technol-

ogy have driven prices lower, and, when combined with utility rebates and energy-efficiency tax incentives, upgrades to LED lighting can be cash flow positive from day one.

When compared to metal-halide and fluorescent lights, LEDs can offer superior energy efficiency and energy savings of up to 50 percent. They also run cooler, last longer, and frequently have a better color rendering index (CRI)—a number which indicates an artificial light’s ability to depict colors as accurately as natural sunlight. Additionally, traditional lighting dims quickly over the course of two or three years, plunging facilities into darkness without routine maintenance. The best LED fixtures

can keep facilities at ideal foot-candle levels for up 150,000 hours, more than 17 years of 24-hour use, with little to no maintenance.

While these benefits are important, those in the food supply chain will truly appreciate LED technology for ways in which it improves food safety across a range of facilities, such as food processing plants, cold storage, and restaurants.

Food Processing Facilities

Organizations like the Illuminating Engineering Society and Penn State Extension recommend more than 100 foot candles for food preparation because workers are safer and do a better job when they can actually see what they’re doing. (A foot candle is a commonly used measure of brightness. The average office space and home is typically between 10 and 30 foot candles.)

In these spaces, which are filled with heat-generating equipment, grinders, slicers, and more, lighting should go above and beyond the OSHA minimum. Proper lighting can prevent costly mistakes, such as slip-and-fall accidents and other employee injuries. It can also help prevent employees from dropping or knocking small items, such as tools or bolts, into food processing machinery or raw materials.

Proper lighting goes beyond brightness—high-quality LEDs also provide a higher CRI than traditional lighting, as noted above. Lights with higher CRI will allow food production employees to more accurately spot mold, discoloration, and other defects.

A single incident can compromise food quality and require a costly recall; bright, clear LED lighting goes a long way toward mitigating this risk by increasing visibility and making misplaced items and defects easier to spot. Thus, while LED lights don’t directly increase food integrity in the way an improved sanitization method might, they indirectly improve food integrity by allowing workers and technicians to perform their jobs competently and safely.

Furthermore, LED fixtures don’t use mercury-filled glass bulbs to house their lighting elements. Without bulbs, there is no chance of broken glass finding its way

into food. In this way, an inherent feature of LEDs provides a direct safety benefit when compared to previous, glass-covered lighting fixtures. To completely eliminate any chance of debris falling into food, purchase fixtures that feature impact-resistant construction.

Food Storage Facilities

While LEDs provide safety benefits in all food storage environments, their impact is most noticeable in cold storage areas. Traditional bulbs have to warm up to reach full brightness. This can take anywhere from a couple minutes for fluorescents to 15 minutes for metal halides. This warm-up time is even longer in a cold-storage environment—anyone who uses a fluorescent fixture is likely familiar with the dim, purple flicker of a cold bulb. Low temperatures also increase degradation and reduce the overall lifespan of arc-based bulbs.

In storage areas with sub-freezing temperatures, workers often need to get in and out quickly. The inadequate lighting provided by cold bulbs forces employees to either linger in the cold while it heats up, potentially endangering themselves, or perform their work in dismal light. By contrast, LED fixtures provide instant illumination in very cold environments. This allows employees to swiftly retrieve the correct product without endangering themselves or the integrity of the food due to the trips, slips, and spills common to a poorly lit area.

Moving beyond safety, LEDs offer massive energy savings in cold storage areas. The alternative to the lengthy warmup period of arc-based lighting is to simply leave metal halide or fluorescent fixtures on at all times; however, this wastes tremendous amounts of energy in areas that are sparsely used. LED lights already offer a 50 percent reduction in energy costs compared to metal halides when in use, and pairing them with occupancy sensors that turns them off when they aren't needed can offer an additional 60 percent energy savings.

Unlike arc-based lighting, LEDs thrive in the cold. High-quality fixtures are rated for use in temperatures as cold as -40 degrees Fahrenheit. The average LED fixture's lifespan already drastically exceeds those of other lights, and stud-

ies suggest it may actually be extended at colder temperatures. That's because excess heat causes LEDs to dim more rapidly, and the cold dissipates heat more effectively.

Food Preparation and Restaurants

Food prep areas at restaurants, bars, cafeterias, and elsewhere also benefit from LED technology. Kitchens are fast-moving and dangerous spaces with knives, slicers, and dangerously hot grills and fryers. Having the bright, clear light of LED fixtures in this often-chaotic environment decreases the likelihood of accidents. Aside from the human toll, such accidents can carry heavy financial costs as well, such as reduced productivity, increased food waste, and personal-injury claims.

Additionally, the high CRI provided by LEDs can help employees identify discoloration when preparing food. The visual difference between a fresh steak and a slightly rancid one can be far subtler than many imagine and almost undetectable in low light. Additionally, proper lighting is an invaluable resource to prevent undercooked or incorrectly-dressed dishes from leaving the kitchen.

Restaurant owners frequently comment that they never noticed how dirty their kitchen was until they installed LEDs. Poor lighting masks dirt, grime, and dust. With inadequate light, chefs may be working on a surface they believe is clean, but LED lighting reveals otherwise. By exposing these deficiencies in sanitation, LED lighting helps chefs and restaurant owners better clean their kitchens. This not only ensures that food is being prepared in the most sanitary environment possible, but it can help boost inspection scores, which most restaurants are now required to post for the public to see.

Select Smartly

When shopping for a new lighting solution, there are a few things to keep in mind.

First, different spaces need different distributions of light. For example, lighting in a narrow aisle needs to be far more focused than it would be in a large, open warehouse. When researching for LEDs, look for fixtures with multiple lens options offering a variety of light distribution

patterns and angles; this will ensure the fixture is suitable for your space.

Second, some food manufacturers' processes require a very specific kind of light. A brewery, for instance, might need a light that emits at a particular wavelength in order to avoid skunking its beer. With previous technologies, such as low-pressure sodium, metal-halide, and fluorescent, the finer details of light were essentially fixed. With new, cutting-edge LEDs, every aspect of light output can be tweaked: brightness, color, color temperature, wavelength, and more. In fact, light manufacturers can create

Lights with higher CRI will allow food production employees to more accurately spot mold, discoloration, and other defects.

a custom "light recipe" designed to meet almost any criteria. If you're in need of a specialized lighting solution, make sure to find a company capable of working with you to create a custom-designed LED fixture.

Look for lighting companies that offer a wide range of financing options, as facility-wide LED upgrades can be a large investment. Some lighting providers may coordinate utility rebates and tax incentives that can reduce the ROI to less than a year. Some lighting companies offer extended payback periods that price payments based on the energy savings the customer obtains. If the cost of a facility-wide upgrade is insurmountable, consider which areas could benefit most from an LED upgrade and start there.

Merits of LED technology include improved efficiency, improved light quality, and improved durability. The ways that these benefits translate to the realm of food safety represents a step forward for the industry and its customers. ■

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Food Service & Retail

FOOD PREPARATION



Preventing Foodborne Illness Using ‘Core 4’

Tips for proper food prep management in restaurants and retail businesses | BY JORDAN ANDERSON

When contaminated food reaches consumers, the results can range from a mild case of cramps to outright loss of life. According to [USDA’s Economic Research Service](#), foodborne illnesses cause 53,245 hospitalizations in America each year, and take the lives of 2,377 people. The USDA says these incidents result in a loss of \$15.6 billion a year for the organizations responsible—not counting the millions of dollars in recovery costs and loss of brand reputation incurred by companies caught up in these outbreaks.

Consider the *E. coli* outbreak that recently enveloped Chipotle, resulting in a food safety crisis that sickened hundreds of its patrons. Business across the Chipotle chain immediately decreased and remained that way months after the outbreak with comparable-store sales still down by more than a fifth.

The company spent millions of dollars to determine the cause of the outbreak, on promotional food giveaways to win back customers, and on an intensive advertising campaign (the largest in its history) designed to restore its brand.

While foodborne illnesses likely will never be eradicated, utilizing the “Core 4” principles remain a viable approach to limiting its prevalence. These principles include clean, separate, cook, and chill.

Clean

When the temperature of food is not properly maintained, bacteria develops. There are many opportunities for this to happen during production, transport, after it is delivered, and while it’s stored in the backroom.

Infectious bacteria can thrive anywhere. By placing an emphasis on hand, utensil, and surface washing, the risk of

foodborne illness can be reduced. Easy-to-follow cleansing tips include :

- Wash your hands for at least 20 seconds with soap and warm running water before and after handling food or using the bathroom;
- Wash the surfaces of cutting boards, counters, dishes, and utensils after each use with warm, soapy water;
- Use paper towels to clean counters or spills as they soak in potential contaminants rather than spread them like cloth towels; and
- Rinse or blanch the surfaces of fresh fruits and vegetables to rid of any dirt or bacteria.

Separate

Even after washing hands and surfaces consistently, people can still be exposed to dangerous illness-inducing bacteria by not properly separating raw meat, seafood, poultry, and eggs. To avoid cross-contamination, always follow these rules:

- Avoid placing ready-to-eat food on a surface that previously held raw meat, seafood, poultry, or eggs;
- Use separate cutting boards when preparing fresh produce and uncooked meats to eliminate the spread of any bacteria either may be carrying to the other; and
- Properly wash the surfaces exposed to raw meat, seafood, poultry, and eggs under warm, soapy running water.

Cook

Regardless of being proactive with cleaning and separating, cooking food to the appropriate internal temperature is still vital. Undercooking may result in the survival of dangerous bacteria that could make consumers ill. [FoodSafety.gov](#) recommends safe minimum temperatures for steak/ground beef at 160 degrees Fahrenheit, chicken/turkey at 165 degrees Fahrenheit, seafood at 145 degrees Fahrenheit, and egg dishes warm until 160 degrees Fahrenheit.

Chill

Last yet not least, chilling food is important because it decelerates the bacterial growth process. By mitigating this, it allows businesses to reduce the risk of being responsible for foodborne illnesses.

Be sure to:

- Always keep the refrigerator at 40 degrees Fahrenheit or below;
- Not over-pack the refrigerator—proper airflow circulation is paramount; and
- Not allow raw meats, eggs, or fresh produce to sit out for more than 2 hours without refrigeration.

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Check It

Enforcing the use of checklists can help food businesses ensure the previously mentioned best practices are indeed executed.

In today's world, checklists are not just reminders for school children to complete trivial tasks. They are key cogs in the everyday operations of surgeons, military leaders, and food safety practitioners. Utilized as a reminder exercise, and comprised of a list of tasks to complete, checklists have become necessary in the food safety industry.

For years, food businesses have endured periodic and some occasionally surprise health inspections from local, state, and federal agencies. To generally prepare, an establishment would put together a last-minute checklist to ensure cleanliness. However, this would not necessarily be reflective of its day-to-day consistency regarding its food safety practices.

Technology can now assist in the development and consistency of these

protocols. Rather than filtering through a book or manually logging checklists, all-in-one digital food safety solutions offer a complete digital Hazard Analysis and Critical Control Point (HACCP) plan to replace these outdated methods. These devices automate processes to comply with the Food Safety Modernization Act and HACCP processes to improve efficiency and allow for continuous monitoring of compliance. Checklists can

be digitally stored and accessed via cloud-based storage capabilities. This not only encourages employees to follow food safety procedure, but offers a paradigm to ensure food is safe for consumption and not the cause of a foodborne illness outbreak. ■

Anderson is the product marketing specialist for the PAR SureCheck platform where he helps provide education on the consequences of improper food safety practice. Reach him at jordan_anderson@partech.com.



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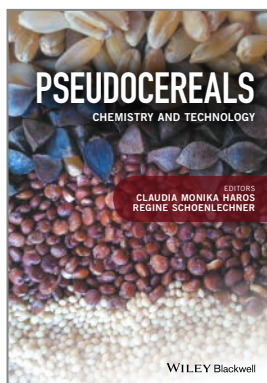
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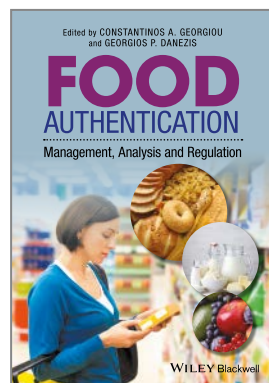
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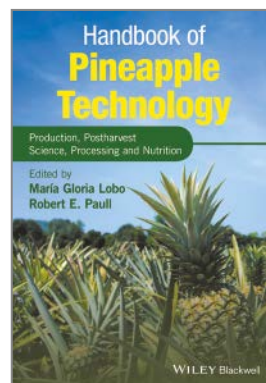
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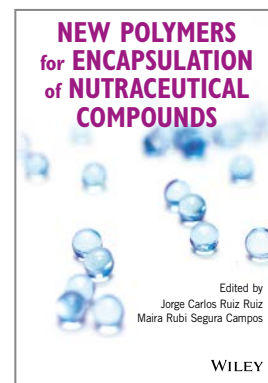
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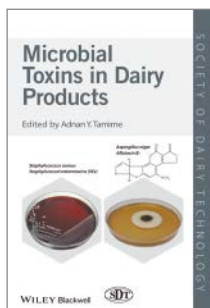
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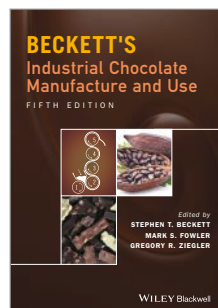
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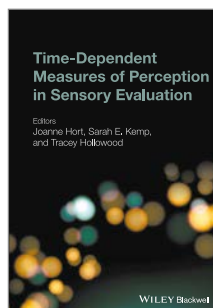
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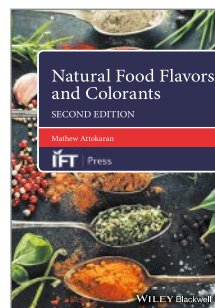
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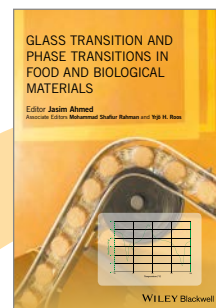
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NEW PRODUCTS

Aseptic Sampler

The IsoPure line of 3-A certified samplers integrate into aseptic and hygienic production lines, offering flexibility with a variety of configurations including several installation positions available. The sampler was designed for quality control personnel to safely sample liquids from closed systems such as food and beverage process lines and vessels while protecting the process and samples from the environment. Sampler body is made from a billet of 316L stainless steel, and is also available in one or two outlet ports and weld or clamp fitting connection models for pipe or tank applications. **Sentry Equipment, 262-567-7256, www.sentry-equip.com.**



Real-Time Recall Management

The Recall + Response real-time SaaS solution for recall and stock withdrawal management empowers food companies both large and small to execute faster, more targeted recall management across their supply chain. System launches automated communications including phone, email, and text notifications that are developed using prebuilt templates in the platform. By preparing and documenting the recall plan in advance, companies can ensure speed of delivery and consistency of notifications to their supply chain partners when a recall happens. Once the recall or stock withdrawal is launched, companies then monitor the platform's dashboard to track the responses gathered and actions taken during a recall or stock withdrawal. **FoodLogIQ, www.FoodLogIQ.com.**



Weigh Modules

Certified by NSF, the SWB805 MultiMount weigh modules can reduce contamination risk and comply with hygienic standards while increasing processing efficiency in industrial settings. Protective bellows do not need to be opened for installation, which further reduces contamination risk. A mirror surface-polish also reduces opportunities for bacterial contamination, as does the fact that weigh modules are fully self-draining to avoid standing water. Hardware is available in 304 or 316 stainless steel for durability, and stainless steel load cells are rated IP68/IP69k for ingress protection. **Mettler Toledo, www.mt.com.**

Floor Sanitizer

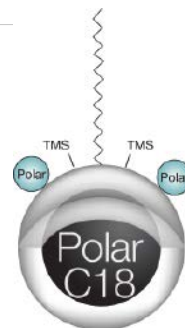
The Sterilex Ultra Step is an EPA registered floor sanitizer that is approved to kill harmful organisms on floors, and in floor mats and foot pans. It holds the same capabilities as the Sterilex Ultra Powder, but in a form further optimized for the plant and live production environment. Based on proprietary PerQuat Technology, this product was developed to enhance food safety and address microbial challenges by controlling organism transfer via foot traffic with low environmental impact. Ideal for low moisture environments. **Sterilex Corp., 800-511-1659, www.sterilex.com.**

Oxalate Film Removal

Foam Clean 317-SP removes oxalate films caused by the washing and preparation of spinach and kale, and is also ideal for other materials where residual oxalate films remain after handling. This alkaline, one-step foaming product can reach any area. Its thick foam clings to surfaces, providing sufficient dwell time while the low surface tension and proprietary blend penetrate and remove the film. Without the need for acids, this product can be easier to use than conventional (acid-based) cleaners. **Madison Chemical, 812-273-6000, www.madchem.com.**

Core Shell Columns

The Kinetex 2.6 μm Polar C18 is the ninth selectivity in the Kinetex core-shell family. This stationary phase combines C18 ligands with a polar-modified surface to enable retention of polar and nonpolar compounds while ensuring aqueous stability. The particle size provides high efficiency and performance on HPLC systems and potential increases in resolution, sensitivity, and separation speed. On UHPLC systems, the 2.6 μm size provides comparable performance to fully porous sub-2 μm particles, but at lower backpressure levels. A key application that can benefit from this dual selectivity is pesticide screening in food. **Phenomenex Inc., 310-212-0555, www.phenomenex.com.**



Multi-Facility ATP Reporting and Analysis

NeoNet is a cloud-based software platform that enables corporate food safety directors to achieve new levels of access, insight, and control of the effectiveness of the sanitation programs at each of their facilities. With the NeoNet system, each facility does routine ATP testing and transfers the results to their

local computer networks. The data is then automatically synced to the customer's universal NeoNet system. Food safety directors have immediate access to their facilities' sanitation test results—no matter where in the world their facilities may be. **Neogen Corp., 800-234-5333, www.neogen.com.**

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Automated Sourcing of Compliant Suppliers

The ReposiTrak MarketPlace enables retailers and wholesalers to search ReposiTrak's community of compliant suppliers and bring new products to market faster. It automates and guides the sourcing process from end-to-end, and includes supplier qualification, order negotiation, and on-boarding of a new supplier. To help retailers and wholesalers reduce risk, the MarketPlace highlights suppliers that are compliant with their business and/or safety requirements. This feature helps retailers replace non-compliant suppliers. **ReposiTrak, Inc. a wholly-owned subsidiary of Park City Group, www.repositrak.com.**

IoT Monitoring for Food Service

The Kitchen Manager is geared for food service operations powered by Internet of Things (IoT)-based technology. It encompasses the new Comark Kitchen Monitor and Comark Kitchen Checks platform to record, monitor, and access temperature data wirelessly—keeping all information in one consolidated area. Kitchen Manager is a web-based, HACCP compliant system made to monitor the temperature of all food storage areas in order to decrease error and time. Temperature data is recorded and stored around-the-clock with access to records through any web connected device, creating an IoT system for temperature monitoring solutions. **Comark Instruments, 800-555-6658, www.comarkinstruments.com.**

Digital Probe Thermometer

The TM26 Waterproof Digital Probe Thermometer allows food and beverage manufacturing professionals the capabilities to monitor products during preparation, production, storage, process control, and quality assurance. The thermometer has a stainless steel penetration probe certified by the NSF and waterproof rated. It measures liquids, pastes, and semi-solid food products with a versatile range from -40°F to 392°F and accuracy of ±1.8°F; 0.1° resolution. **Extech Instruments, 877-239-8324, www.extech.com.**



Thermocouple Thermometers

The 900 series handheld thermometers are easy to clean with minimal crevices that won't collect dirt. Able to handle demanding food processing environments, thermometers are durable and tested to withstand impact, shock, drop, and vibration. Store temperature data in 5 minutes with the out-of-the-box mobile and cloud storage solution, or integrate thermometers into existing quality software with the Developers' Kit API and libraries. The 93X models are Bluetooth low energy technology-enabled thermometers, while the 91X features a 2,000-hour battery life. **TEGAM, 800-666-1010, www.tegam.com.**

X-Ray Machine Designed for Poultry Industry

The RMI 400 features a conveyor system that inclines at a gradual angle on the infeed and discharge, allowing for a curtain-less tunnel to be created. This prevents the pathway of radiation from the machine from an operator safety perspective and means that only the conveyor belt will make contact with the product. The X-ray machine is designed using NAMI construction standards and complies with IP69 ingress protection standards. Unobstructed sightlines, open and contoured surfaces minimize potential material harborage areas while providing capability for fast and convenient visual inspection. In addition, the entire machine can be disassembled by a single person in a matter of minutes for thorough sanitation and quick reassembly to maximize production uptime. **Eagle Product Inspection, 877-379-167, www.eaglepi.com.**

Business Briefs

Validated for a range of milk commodities, **Romer Labs'** new AgraQuant Aflatoxin M1 ELISA is more sensitive and accurate, allowing detection to exceed the requirements of existing regulations.

3M Food Safety's Molecular Detection Assay 2—*E. coli* O157 (including H7) has been granted First Action status through the Official Methods of Analysis program by AOAC.

Recall Infolink receives U.S. Patent #8,145,574 titled "Recalled Product Inventory Notification, Removal, and Verification System," covering the centralized database that improves the management of recall data.

Novolyze adds four references to its SurroNov range of dry and ready-to-use surrogate microorganisms for assessing impact of a thermal process on the inactivation of *Salmonella*, including applications for nuts & seeds (SurroNov 1822); pet food & animal feed (SurroNov 1824); herbs & spices (SurroNov 1826); and biscuits & snacks (SurroNov 1832).

FoodLogiQ expands reporting tools within its software FoodLogiQ Connect to allow customers to create an unlimited number of custom reports to visualize the millions of data points tracked.

PURE Bioscience has received two key regulatory notifications on path to commercialize PURE Control as a raw poultry processing aid: Acknowledgement Letter from the FDA states that FDA had completed its review of the safety and efficacy of SDC and a permission letter from USDA's FSIS grants approval to conduct an in-plant poultry processing trial of SDC-based PURE Control antimicrobial.

Agri-Neo adds sprouting seeds, including alfalfa, broccoli, and clover, and other varieties to the lineup of seeds and grains compatible with their organic and validated 5-log pathogen intervention solution, Neo-Pure.

NSF International develops an independent certification protocol—Raised Without Antibiotics—to certify animal products have been raised without exposure to antibiotics.

Gelest's BIOSAFE HM4100 antimicrobial is now compliant for food contact and drinking water applications after FDA and EPA review.

Advertiser Directory

ADVERTISER	PAGE	ADVERTISER	PAGE
Ametek Brookfield	11	Millipore Sigma	9, 52
Best Sanitizers	33	Nasco	18
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Events

JULY

9-12

IAFP Annual Meeting

Tampa, Fla.

Visit <https://www.foodprotection.org/annualmeeting/>.

10-13

Advanced HACCP and Implementing SQF 8.0 Systems Compliance Seminar

Rancho Cucamonga, Calif.

Visit www.easconsultinggroup.com, call 571-447-5508, or email ascanlin@easconsultinggroup.com.

AUGUST

1-2

Dairy Plant Food Safety Workshop

New Berlin, N.Y.

Visit <http://www.usdairy.com/events>.

21-25

Introduction to Food Science

New Brunswick, N.J.

Visit http://www.cpe.rutgers.edu/programs/food_science_food_safety.html.

SEPTEMBER

24-27

AOAC Annual Meeting and Expo

Atlanta, Ga.

Visit <http://ow.ly/2Mj530adGr2>.

25-27

Food Contact and Additives 2017

Crystal City, Va.

Visit <http://www.food-contact.com/food-contact-and-additives> or call 330-762-7441.

OCTOBER

3-4

Dairy Plant Food Safety Workshop

Dallas, Texas

Visit <http://www.usdairy.com/events>.

3-5

HACCP Plan Development for Food Processors

New Brunswick, N.J.

Visit <http://www.cpe.rutgers.edu/courses/current/lf0403ca.html>.

18-19

Sensory Evaluation

New Brunswick, N.J.

Visit <http://www.cpe.rutgers.edu/courses/current/lf0606ca.html>.

20

Making Sense of the Numbers: Statistics for Food Scientists

New Brunswick, N.J.

Visit http://www.cpe.rutgers.edu/programs/food_science_food_safety.html.

24-26

Pasteurizer Operators Workshop

University Park, Penn.

Visit <http://agsci.psu.edu/pow>.

NOVEMBER

6-8

Better Process Control School

New Brunswick, N.J.

Visit <http://www.cpe.rutgers.edu/courses/current/lf0703ca.html>.

7-9

SQF International Conference

Dallas, Texas

Visit <http://www.sqfi.com/forms/meeting/Microsite/SQFConf-2016>.

DECEMBER

4-5

Practical Food Microbiology

New Brunswick, N.J.

Visit <http://www.cpe.rutgers.edu/courses/current/lf0401ca.html>.

SCIENTIFIC FINDINGS

For access to complete journal articles mentioned below, go to “Food Science Research” located in June/July 2017 issue at www.FoodQualityandSafety.com or type the headline of requested article in search box.

ARTICLE: Detection of *Salmonella* Serotypes by Overnight Incubation of Entire Broiler Carcass

There are multiple ways to sample broiler chicken carcasses for the prevalence of *Salmonella*. The objective of this study was to confirm efficacy of whole carcass enrichment compared with carcass rinse aliquot method for detecting naturally occurring *Salmonella* on processed broiler carcasses collected directly after all processing interventions applied in a commercial slaughter plant. All isolates were also subjected to serotype characterization to test for any effect that detection method may have on the *Salmonella* serotype recovered. **Journal of Food Safety, Volume 37, Issue 2, May 2017, e12298.**



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ARTICLE: Causes and Contributing Factors to ‘Dark Cutting’ Meat

Dark cutting in beef and sheep meat has been the subject of extensive research with numerous connections established between it and various production practices. Despite these associations, dark cutting still occurs and causes significant financial losses globally in the fresh meat market. Consumers tend to reject dark meat as it is perceived to be from old or poorly-handled animals and is described as being tough, having an undesirable flavor, and having a short shelf-life. Classifying carcasses as dark cutters on the basis of ultimate pH or color using one muscle, such as the *m. longissimus thoracis* can lead to mis-description of other muscles within the same carcass and loss of income across the supply chain. This review identifies the factors predisposing animals to dark cutting and provides recommendations and directions for future research. **Comprehensive Reviews in Food Science and Food Safety, Volume 16, Issue 3, May 2017, Pages 400–430.**

ARTICLE: Protein Characteristics that Affect the Quality of Vital Wheat Gluten to be Used in Baking

The use of vital wheat gluten in the baking industry and wheat flour mills aims to improve the rheological characteristics of flour considered unsuitable to obtain products such as sliced bread, French bread, high-fiber breads, and other products that require strong flours. To improve characteristics such as flour strength, dough mixing tolerance, and bread volume, vital wheat gluten is added to flour. However, the vital wheat gluten commercialized in the market has few quality specifications, especially related to the characteristics of the proteins that comprise it and are responsible for the formation of the viscoelastic gluten network. Information on protein quality is important because variations are observed in the technological quality of vital wheat gluten obtained from different sources, which could be associated to damage caused to proteins during the obtainment process. This review covers the concepts, uses, obtainment processes, and quality analysis of vital wheat gluten, as well as simple tests to help identify details about protein quality of commercial vital wheat gluten. **Comprehensive Reviews in Food Science and Food Safety, Volume 16, Issue 3, May 2017, Pages 369–381.**



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ARTICLE: Removal of Cadmium from Contaminated *Lentinula Edodes* by Optimized Complexation and Coagulation

The aim of this study was to explore processes for removing toxic heavy metal (cadmium) from polluted *Lentinula edodes*, commonly known as shiitake mushrooms. Complexing agents (EDTA and sodium citrate) were used to leach heavy metal from contaminated *L. edodes*. Lentinan was then extracted, and complexing and coagulating agents (active carbon, polyaluminium chloride, and chitosan) were applied to remove the heavy metal. Some factors that can affect the binding capacity, such as pH, the dosage of agents used, and the initial valence state of cadmium (by addition of oxidant), were investigated. This work filled the gaps in the study of dealing with heavy metal-polluted mushroom, with regard to potential use in treating of heavy metal-polluted food. **Food Science & Nutrition, Volume 5, Issue 2, March 2017, Pages 215–222.**

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