The Hornblower

NORTHERN CALIFORNIA INSTITUTE OF FOOD TECHNOLOGISTS

NCIFT 2026 Suppliers' Night Symposium

by Jaime Reeves, Symposium Chair

The 2026 NCIFT Suppliers' Night Symposium was a tremendous success, bringing together food industry professionals, scientists, and innovators for an afternoon of thought-provoking discussion and meaningful connection. Held on May 5 at the Alameda County Fairgrounds, this year's symposium, *Innovation at the Crossroads: Regulatory Realities and Emerging Consumer Forces Shaping the Future of Food*, delivered valuable insights into the evolving future of food and beverage innovation.

Attendees heard from an outstanding lineup of speakers, including Dr. Brendan Niemira, Chief Science and Technology Officer of IFT, who shared perspectives on the rapidly changing regulatory landscape and the importance of science-based advocacy in shaping food policy. Mattson Co.'s Amanda Sinrod and Dr. Tatiana Praet captivated the audience with their presentation on emerging consumer trends, exploring the rise of protein culture, flavor-led innovation, women's health, and the growing demand for intentional indulgence.

The event sparked lively discussion, engaging Q&A sessions, and valuable networking among industry leaders and attendees. NCIFT's 2026 symposium highlighted the power of collaboration between science, policy, and consumer insight in driving the next generation of food innovation.

Suppliers' Night was a great event this year. See the back page for more photos.

NCIFT 2026 Suppliers' Night Exposition

by Karen Dawes, Suppliers' Night Chair

After the engaging NCIFT Suppliers' Night Symposium featuring speakers from Mattson Co. and IFT's CSTO, Dr. Brendan Niemira, attendees headed to the expo hall for a lively event. At the Symposium closing, Jaime Reeves encouraged us to meet two new people. With more table registrations this year, all with colorful displays and many with delicious samples, it was easy to make friends. Attendees had the opportunity to learn about ingredients and technology innovations. Many industries that support food businesses were present as well. Suppliers' Night was a one-stop shop to learn about what is new in the industry!

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By Erin Evers

The NCIFT New Professionals crew got spoiled this month thanks to a fantastic event hosted by the OLIPOP team. Four of their team members put together an exclusive event that was equal parts learning, laughing, and sugar-free fizz.

One of the highlights? Each OLIPOP presenter shared a quick slide about themselves—how they got into the industry, what they do today, and even what they're up to when they're not building the future of functional soda. It was such a fun, personal way to get to know the real people behind the brand.

Then the games began. First up was a blind "Guess the Flavor" tasting, which turned out to be way harder than anyone expected. The OLIPOP team provided everyone with a full dirty soda bar—featuring all of the Olipop flavors!

As always, these NCIFT New Professionals events shine because of the connections made. It's such a rare treat to get young food scientists together ***in person*** to swap stories, talk shop, and build a community that will grow with them throughout their careers.

Huge thank you to OLIPOP for hosting and creating a memorable, hands-on experience for our group! If you or your company would like to host our next event, please contact Erin Evers.

The Hornblower

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In Memoriam: Professor Emeritus Charlie Shoemaker

by FST Chair Christopher Simmons and Dr. Sharon Shoemaker

Regretfully, I must announce the passing of Professor Emeritus Charlie Shoemaker on April 13, 2026. Charlie was an internationally renowned food scientist, educator, mentor and collaborator. His career with UC Davis spanned 35 years, including 10 years as department chair. He was an authority in the physical chemistry of foods, specifically how the composition of polymers affected texture and processing methods. Remembered as a highly knowledgeable and friendly colleague by faculty, and an approachable and clear instructor by students, Charlie was also an early champion of diversity efforts at the university. His close association with universities in China resulted in the establishment of a Confucius Institute in Davis. He was recognized by the university, receiving our college's Affirmative Action and Diversity Award in 1998.

Charlie, along with his wife and fellow Emerita Dr. Sharon Shoemaker, led a career-long mission to increase international engagement with food science programs abroad. This is most evident in his work with Jiangnan University, which led to collaborative research and the exchange of both knowledge and culture across multiple disciplines (for example, research on the chemical and physical properties of rice – to the benefit of rice growers in China and California alike). Charlie was one of the few academics to be granted China's Friendship Award (2007), their highest honor for foreign experts.

After his retirement in 2014, Charlie remained an active supporter of the department. He also pursued his passions close to home and abroad, balancing his love and support for the Davis community with everlasting enthusiasm for developing collaborations and friendships overseas.

In remembrance of his legacy, the Charles F. Shoemaker Memorial Fund has been established to support deserving graduate students in Food Science and Technology. Contributions to this fund will help ensure that Charlie's commitment to mentorship, excellence, and opportunity endures in the next generation. Those who wish to honor his memory in a meaningful and lasting way are invited to consider making a gift. **https://give.ucdavis.edu/AFST/325963**

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Is There More Than Just Coffee in Your Morning Brew? Microplastics in Your To-Go Coffee Cups

By Natalie Van Ert (Department of Nutrition, Food Science, and Packaging, San Jose State University)

News of microplastics has increased in recent years, with some pretty alarming claims. It is hard not to be concerned when scientists have reported microplastics in many human tissues and fluids, including areas like the brain, heart, and even breast milk (Savchuk, 2025). Once you start paying attention, you notice how much plastic we come into contact with every day through packaging, utensils, bottles, and takeout containers. Microplastics are typically described as plastic particles smaller than 5 millimeters, and they can keep breaking down into even smaller fragments over time (Savchuk, 2025). This raises an important question, are everyday habits, like grabbing hot coffee in a disposable cup, increasing our exposure?

A recent Food & Wine article points to a 2025 research study that looked at to-go cups as one possible source of microplastic exposure (Leasca, 2026). In the study, Liu et al. (2025) tested common cup materials under different temperature conditions to estimate how many microplastic particles end up in the liquid. They compared cups made fully of polyethylene (PE) with paper cups that have a PE coating, since both are commonly used for hot drinks. Under their test conditions, fully PE cups released the most microplastics, PE-coated paper cups released fewer, and hotter liquid was linked with higher particle release overall (Liu et al., 2025). The heat seems to make the problem worse, which makes sense because higher temperatures can stress packaging surfaces.

Liu et al. (2025) also suggested the inner surface of the cup matters. They discussed how the structure and texture of the material could affect how easily tiny fragments detach when exposed to hot liquids over time. This connects to what packaging scientists call migration, meaning material can move from a food-contact surface into a beverage, and the amount transferred can change based on temperature and contact time (FDA, 2025). Even though the experiments were controlled, the topic feels very relevant because hot coffee is part of many people's daily routine.

The researchers also described limitations that are important when thinking about real consumption. Their experiments used deionized water rather than actual coffee drinks, and coffee is more complex than water. Coffee is acidic, and many people add milk or cream, which introduces fat. Those factors could change how the drink interacts with the cup surface, so results in real life could be different depending on the beverage and the situation (Liu et al., 2025). They also pointed out that less release does not automatically mean safer. Particle size could matter as much as the total number of particles, since smaller particles could behave differently in the body (Liu et al., 2025).

The Stanford Medicine article makes it clear that scientists are still working out what microplastics mean for human health, including questions about whether particle size changes risk (Savchuk, 2025). Finding microplastics in the body shows exposure is happening, but it does not automatically tell us which levels cause harm or what outcomes are truly linked. For me, that is why this will probably become a bigger area in food science, especially in testing foods and packaging materials and studying how everyday conditions change contamination. I also think it creates an opportunity for better packaging designs and improved materials that shed less.

This topic connects a normal daily habit to a larger food science issue involving food packaging and migration. The research study suggests hot liquids and longer contact time can increase microplastic release from certain cups, and the Stanford article shows microplastics are already being found in the human body, even though long-term effects are still being studied (Liu et al., 2025; Savchuk, 2025). While it is tempting to say we should eliminate plastic completely, we live in a plastic jungle. I do not think avoiding exposure entirely is realistic, but cutting down where we can is. So next time you go to the coffee shop on your way to work or school, ask them to fill your reusable stainless-steel or glass cup instead of a disposable one. It is a small change, but it is a practical way to reduce unnecessary exposure while researchers keep working on what levels are actually harmful and which materials are safest.

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NCIFT 2026 Suppliers' Night Exposition

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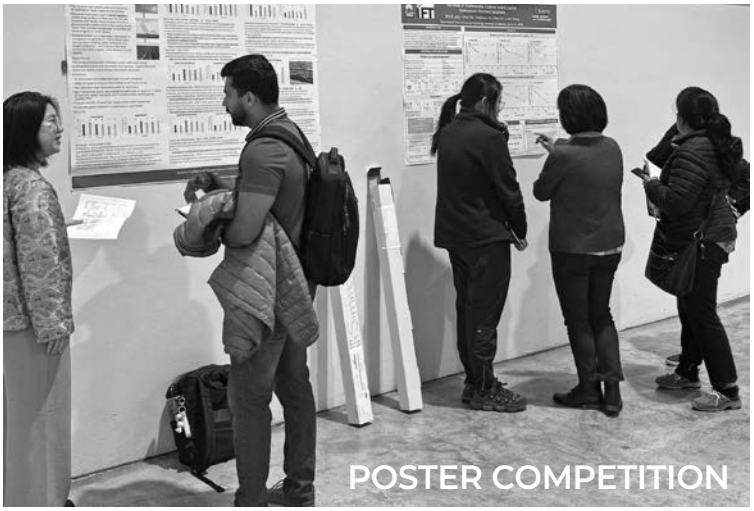
Many of us remember the excitement of attending Suppliers' Night as students. This year, the NCIFT community continued to show support for the next generation of food scientists. The UC Davis Food Tech Club representatives shared plans for next year- congratulations to the soon-to-be graduates! NCIFT supporters from SJSU also attended the event. Students participating in the poster competition were on-site – even with finals looming! The poster competition is a terrific opportunity to present research and respond to questions.

The food science community truly is amazing. Former NCIFT board members and retirees volunteered and shared memories. There were conversations about the Monday golf tournament and dinner. Many suppliers and attendees traveled great distances, proving that although tools help us meet and share information remotely, nothing replaces in-person connections.

What does it take to host an event at a county fairground? A LOT of planning! Imelda Vasquez and Marketing Designs make sure that registration and set up are as seamless as possible. Jaime Reeves organized the well-attended Symposium. Jas Walia and Daniel Andrews make the golf tournament magic happen. Parastoo Yaghmaee supports the student poster competition. And there are many more NCIFT volunteers supporting Suppliers' Night – thank you to everyone for another success!



Bridging the Gap: the Techno-Commercial Case for Plant Protein Platforms

By Tatiana Praet, PhD (Senior Group Manager, Product Development – Mattson)

At A Glance

As protein-fortified food categories move mainstream and the animal supply chain faces increasing pressure, the plant protein industry is transitioning from generic alternatives to high-performance 'functionalized' proteins and 'designer' isolates. This shift replaces 'SKU-by-SKU' formulation with modular, platform-level innovations that solve critical hurdles like beverage solubility and bar texture stability. Success now hinges on deep co-development to translate these technologies into scalable, clean-label solutions that optimize both sensory appeal and commercial viability.

The Strategic Pivot From Niche Market to Necessity

With the latest dietary guidelines moving protein to the forefront of the food pyramid (Dietary Guidelines Advisory Committee, 2025), the industry is experiencing a structural pivot. The cooling interest in traditional meat analogues stands in stark contrast to the booming demand for protein-fortified and performance-oriented foods, forcing a total rethink of how plant-based platforms are deployed. The surge in protein demand is simultaneously colliding with a 'hard ceiling' in the animal protein supply chain: muscle-derived proteins face sustainability scrutiny, whey and caseinate are plagued by inelastic supply and price volatility, egg supply is repeatedly throttled by Avian Influenza, and the marine industry contends with rising microplastic and heavy metal contamination. Moreover, supplemental protein sources such as bone broth are limited by their savory profiles and incomplete amino acid composition, yielding diminished PDCAAS scores unless supplemented by secondary protein sources.

This supply squeeze presents an opportunity for plant proteins that extends far beyond the 'vegan' niche segment. However, the industry's historical reliance on 'SKU-by-SKU' formulation has failed to provide a plug-and-play replacement for animal-derived ingredients. To unlock the next generation of nutrition, brands and suppliers must shift to 'platform thinking'; translating supply bottlenecks into whitespace opportunities by engineering foundational, modular technology systems that solve functionality gaps across an entire portfolio.

Navigating Cross Functional Trade-offs for Successful Portfolio Integration

Successfully integrating plant proteins across a CPG portfolio requires a holistic understanding of how commercial benefits interact with biochemical constraints. Plant protein platforms offer significant raw material cost reductions and enhance supply chain resilience by diversifying away from animal protein volatility. Beyond risk mitigation, these platforms are also vital levers for achieving corporate ESG targets.

In order for plant proteins to become widely accepted, product positioning must balance nutritional quality with consumer acceptance. While plant proteins are ideal for 'better-for-you' claims such as cholesterol-free and lactose-free, critical trade-offs exist between PDCAAS, allergen status, and non-GMO positioning. Transitioning from bench-top to commercial scale reveals significant technical hurdles, as plant isolates hydrate differently than soluble animal proteins. Capturing cost and margin benefits requires close alignment with engineering; implementation often necessitates capital expenditures for high-shear mixing or adjustments to line speeds to prevent equipment fouling during thermal processing.

Ultimately, the matrix dictates the technology. Front-loading these cross-functional considerations into the Stage-Gate process transforms technical risks into manageable variables, ensuring that formulation decisions remain commercially resilient from bench-top to retail shelf.

Functionalized Proteins and Designer Isolates: Transforming Functional Gaps Into Competitive Advantage

Despite profound strategic advantages, plant proteins face a primary hurdle: inconsistent functionality. Unlike the predictable behavior of dairy or egg proteins, plant protein isolates often suffer from poor solubility, earthy and beany off-notes, and aggressive water-binding. To move beyond these constraints, the industry must transition from simple extraction toward fundamentally re-architecting the protein's molecular behavior through advanced physical and biochemical levers.

Through physical functionalization, mechanical stresses like high-pressure homogenization (HPH) act as a molecular hammer, shattering large protein aggregates into smaller particles. It causes the proteins to unfold, exposing buried hydrophobic groups, and improving the protein's ability to stabilize emulsions and foams (Melchior et al., 2022). This technology can be applied in plant-based milk and creamers, as it eliminates the chalky mouthfeel common in pea or oat milks, and can help prevent creaming in coffee. This method can also be used as a 'green' technology to improve the functional properties of various plant proteins while simultaneously acting as a pre-treatment that increases enzymatic accessibility, enhancing the release of health-promoting bioactive peptides during digestion (Oliveira et al., 2025).

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For solid matrices like nutrition bars, formulators rely on thermal-mechanical treatments like extrusion and microparticulation. By deliberately unfolding the protein and promoting crosslinking of exposed sulfhydryl groups, or creating smaller stable particles, the protein's native water-binding capacity can be lowered (Xu et al., 2023)(Shi et al., 2023). This technology has been a critical advancement in solving the 'brick bar' phenomenon in protein bars. It is effectively preventing moisture migration out of the bar, keeping it soft and chewy on the shelf for 12 months instead of hardening into an inedible block.

Beyond physical manipulation, biochemical functionalization provides a pathway for molecular derivatization: the intentional re-architecture of the protein's chemical composition and structure without synthetic reagents. Using enzymatic 'scissors' (hydrolysis) to prune peptide chains into high-solubility micro-peptides (Samaei et al., 2020) fundamentally alters a protein's behavior in solution. This is the critical breakthrough enabling crystal-clear, grit-free RTDs, particularly in high-protein formulations that would otherwise be thick, opaque, and prone to sedimentation. Furthermore, this precision cutting serves the performance nutrition category by accelerating peptide absorption, offering a functional edge over intact plant proteins. While enzymatic hydrolysis is the gold standard for reducing viscosity in high-protein beverages, pruning peptide chains can lead to bitterness, requiring formulators to precisely balance the texture improvement against the sensory risk.

Conversely, enzymatic 'glue' (cross-linking) stitches chains together to create the elastic networks required for meat-like textures (Zimoch-Korzycka et al., 2024) and the thermo-stable structural integrity required for certain plant-based dairy analogs (Shi et al., 2025). In deli slices, it allows the product to be sliced paper-thin without crumbling. In yogurt, it creates a thick, creamy 'spoonable' texture that doesn't 'whey out' (leak water) when the container is opened. While biochemical conversions significantly enhance techno-functional properties, their application for delivering the specific melt-stretch behavior in plant-based cheese analogues remains an emerging frontier in protein engineering.

Finally, the 'sensory tax' is being neutralized through proprietary physical deflavoring (Anderson et al., 2025). This clean-label dry-processing method removes off-flavors right at the source, while minimizing protein damage. This breakthrough in sensory neutrality transforms plant proteins from a formulation challenge into a versatile building block for delicate flavor systems. By eliminating 'beany' and earthy off-notes, these isolates enable clean-label dairy alternatives where coffee or vanilla notes can lead without interference, and allow for high-protein confectionery that maintains an indulgent, candy-like profile. In the specialized nutrition sector, it ensures that infant and medical formulas remain palatable and sweet, removing the 'sensory tax' that often leads to poor consumer compliance. Ultimately, a neutral base reduces the reliance on costly masking agents, shortening the ingredient list while significantly expanding the protein's reach into mainstream, flavor-sensitive categories.

Achieving the high-purity thresholds required for designer isolates necessitates significant capital expenditure in advanced separation and purification. Sustainable commercialization therefore hinges on managing overall process costs while simultaneously identifying viable market outlets for the byproduct fiber, starch, and oil streams generated during fractionation.

Success in the next decade belongs to the 'molecular architects' who can engineer designer isolates that bridge the gap between biochemical invention and commercial reality. By identifying specific matrices where animal proteins can be functionally and cost-effectively replaced by highly functionalized plant proteins, these innovators can unlock opportunities where plant proteins actually surpass animal proteins in techno-commercial value.

Customer Co-Development as a Catalyst

Co-development between ingredient suppliers and CPG brands is the essential catalyst for accelerating this transition. Capturing true techno-commercial value requires suppliers to move beyond transactional sales and provide the deep applications expertise necessary to integrate plant proteins into complex matrices. By aligning specific technical requirements early on, partners can transform technical challenges into unique commercial advantages.

Ultimately, the leaders of this shift will define the next generation of nutrition by translating molecular insights into scalable industrial solutions, and they will also successfully resolve the long-standing tension between ingredient functionality and the consumer's non-negotiable demand for clean-label transparency. In doing so, they turn global supply constraints into profitable, resilient, and superior-tasting ingredient portfolios.

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Photo by Mike Jones from Pexels: https://www.pexels.com/photo/man-holding-cardboard-tray-of-takeout-drinks-9461795/

Presentation recap – Moisture Management Made Simple: Controlling Water for Shelf-Stable Food Quality and Safety

Dr. Cartwright

Zachary Cartwright, PhD, delivered an engaging and practical presentation at the California League of Food Processors on **"Moisture Management Made Simple: Controlling Water for Shelf-Stable Food Quality and Safety."** Drawing on his deep scientific expertise, Dr. Cartwright broke down the complexities of water activity and moisture control into clear, actionable insights for food manufacturers. His talk connected the science directly to real-world applications, highlighting how effective moisture management can extend shelf life, protect product quality, and reduce food safety risks. Attendees valued his ability to make a technical topic approachable while reinforcing its critical role in successful shelf-stable food production.

Bridging the Gap: the Techno-Commercial Case for Plant Protein Platforms

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Color Enhances Quality and Safety Programs

by Richard F. Stier

Bright colors are used to lift people's spirits and bring happiness, but they also can be used to enhance food processors (and restaurant) quality and safety programs. People's eyes are drawn to color especially if there are predominantly neutral colors like blacks, grays and whites. So, management should consider using color to better communicate their messages that relate to food quality and safety, sanitation, personal hygiene, and food defense. Let's look at some examples from industry,

One of the best uses of color in a food safety management program that I have seen is how bright and highly visible colors have been used in allergen management. Processors have used colors for identifying allergens upon receipt, warehousing ingredients and products containing allergens, flagging allergens on production records, clearly identifying work-in-process, and actual allergen handling. These applications target minimizing the potential for cross-contact throughout the processing plant. Let's look at each of these applications.

Allergens must be managed as soon as they enter the warehouse at the receiving dock. The warehouse receiving team should have a master list of all ingredients that contain allergens. When pallets, drums, totes or whatever that contain an allergen, they should be tagged with a brightly colored sticker or tag that identifies that material as containing an allergen. I have observed companies that use a single allergen tag for all ingredients containing allergens or a different color for each allergen.

Materials containing allergens should then be warehoused in a designated area. The warehouse staff should clearly designate where these materials are stored and the use of brightly colored stickers or markers are great markers. No material or ingredient containing an allergen should be stored above one that is allergen-free. This reduces the potential for cross-contact. There are some excellent products on the market that can be used for identifying allergens. One product uses different colors for each allergen plus the name of the allergen and a picture of the allergen in question. Look for products that are bumper-sticker sized.

Some operations will flag production records especially those used for formulation with tags or language that clearly identifies that the product contains one or more allergens. The use of a bright color reminds the production staff that the formulation contains allergens.

Work-in-process (WIP) or rework that contain allergens should be similarly flagged to remind staff that the item in question contains allergens. The bright colored tags alluded to earlier may be used here.

The last application is for allergen handling and is, again, aimed at minimizing the potential for cross-contact. Many ingredients are weighed or measured as part of the formulation which entails handling the ingredients using different utensils usually scoops or pails. Processors will designate different colored utensils for handling specific allergens. Bright signage is posted in the blending area that identifies what colored scoop is to be used with each allergen that must be handled. Some companies employ colored plastic scoops. Some discourage this since plastic can break or begin to flake thereby adulterating the product. Others use stainless steel scoops with different colored handles. The handles never touch the product.

Another area where colors are used to identify different elements and materials are cleaning and sanitizing operations. Processors must keep their equipment, floors, walls, drains, and utensils clean. They employ many different tools to do this such as brushes, squiggies, buckets, sponges, and scouring pads, plus different chemicals like detergents, caustic cleaners, and different sanitizers. To ensure that the cleanup is done according to established procedures and safely, processors and cleanup crews often develop protocols defining what colors are used for what applications. As an example, yellow brushes for cleaning food contact surfaces while red tools would be used for floors or drains. Cleaning compounds might be mixed in white buckets and sanitizers in blue. The colors designated for each application are posted and also incorporated into the documented cleaning procedures and when the protocol refers to a yellow brush, the yellow brush in the protocol is actually yellow.

Many operations incorporate colors into their personal hygiene programs. One of the most common is to cloth people in different colored garments and/or headgear depending on where they work in the processing facility. This is often employed in facilities that have what they consider a raw and processed side of the facility. The processed side may also be referred to as the RTE or Ready-to-Eat side. Workers on the raw side might be clothed in white smocks and caps whereas those on the processed side will be in blue. The colored garments ensure that employees remain in their designated area. If they do have to cross-over, they must pass through a changing station and change into the proper garment for that area.

Another application of color for personal hygiene is the color of the hairnet. Workers are supposed to wear hairnets that cover all their hair and their ears. It is up to management to monitor the staff to ensure they comply. Many companies mandate that only white hairnets be used believing that a dark colored hairnet does not allow them to properly gauge compliance with employees who have dark hair.

Another application for color is with chemicals used in the food plant. One class of chemicals in which color is now playing a role is lubricants. There are a number of different lubricants that are used in food plants. Perhaps the most common is what a food grade lubricant. These are allowed "incidental contact" with food but they can also adulterate a product if used improperly. Processors must never use non-food grade lubricants for situations allowing incidental contact. To help ensure that the proper materials is used, lubricants are now available in different colored containers. Food grade may be green and non-food grade red. If a lubricant is purchased in bulk

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Color Enhances Quality and Safety Programs

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and transferred to an applicator of some sort, processors now utilize different colored applicators. To remind staff, signage in the areas where the materials are stored describes how to use the materials and emphasize the colors for mandated for different products.

There are many other places where colors can be used to enhance quality and safety. One of these that applies in both the processing industry and in foodservice/restaurant operations is how cutting boards are used. The example below shows how a foodservice operation in Hawaii used different colored cutting boards for different applications. The colors employed were described in both English and the Hawaiian language. The example below was posted in the kitchen where it was easily visible.

So, the goal is to ensure that what is being produced is safe and wholesome and of good quality. Look to educate and refresh your people by creating well-documented procedures, and consider using colors in your procedures and signage that is posted around the plant. If someone is color-blind, do what the Hawaiians did; write the color next to the color in multiple languages.

Use	RAW MEATS	PRODUCE	DAIRY PRODUCTS
Color	Red 'Ula 'ula	Green Oma'Oma'o	White Ke'oke'o

Use	POULTRY	SEAFOOD	COOKED MEATS
Color	Yellow Melemele	Blue Polu'	Brown Uliuli