

WHITE PAPER : How to Determine if Color-Coding Should
Be Part of Your Food Safety Program

Top pathogens accounting for the majority of estimated annual deaths and illnesses in the United States

Pathogen	Estimated annual deaths	Estimated annual illnesses
Salmonella, nontyphoidal	378	1,027,561
Toxoplasma gondii	327	4428
Listeria monocytogenes	255	1600
Norovirus	149	5,461,731
E.coli (STEC) O157	100	265,000
Campylobacter spp.	76	845,024

Sources:
Centers for Disease Control and Prevention
NC Dept. of Health and Human Services

Understand the risks that can affect food safety.

Foodborne pathogens have been known to cause a host of health complications ranging from mild diarrhea to organ failure, paralysis, neurological impairment, blindness, and death.⁽¹⁾ In fact, according to recent data from the Centers for Disease Control and Prevention, each year roughly 1 in 6 Americans (or 48 million people) gets sick, 128,000 are hospitalized, and 3,000 die of foodborne illnesses.⁽²⁾

These are significant numbers, particularly for those concerned with protecting food safety and/or working in the food processing industry.

Whether it's packaged beef tainted with E. coli or spinach contaminated with listeria, when the safety of food products has been compromised, the rippling effects of a recall can be staggering. For instance, in October 2012 when a recall of peanut butter and related nut products was instituted due to a multi-state outbreak of salmonella, more than 400 products distributed throughout the U.S. were affected.⁽³⁾ The food processor at the center of the controversy was temporarily shut down and hundreds of products were pulled from the shelves and out of distribution.

The costs associated with an extensive recall can be significant. It's estimated that food safety outbreaks from the four most common bacteria (which include salmonella and E. coli) cost the U.S. economy nearly \$7 billion annually.⁽⁴⁾ In the case of the peanut butter maker, not only was the processor's operations suspended and its reputation potentially tarnished, the processed nuts showed up in hundreds of recognized brands sold on the shelves of reputable grocers from coast to coast.

As with many manufacturing businesses, there are ways to manage the risks. In the case of food processing, one practice that is gaining momentum is color-coding to differentiate steps or parts of a food process and help reduce the risk of food safety issues.

So how can a food processor determine if color-coding can help its operation? Here are some of the criteria to consider.

Review today's federal regulations.

There are various government regulations and agencies either in place or proposed to help maintain the integrity of the food processing industry.

Registration and Inspection — FSMA and the FD & C

The federal government has long been a watchdog for food safety in the United States. Then in January 2011, President Obama signed into law the Food Safety and Modernization Act (FSMA). This act enables the Food and Drug Administration (FDA) to better protect public health by strengthening the food safety system. Recognizing that preventive control standards improve food safety only to the extent that producers and processors comply with them, the act is intended to give the FDA oversight to ensure compliance and the ability to respond when problems emerge.

As part of this action, the FSMA amended section 415 of the Federal Food, Drug and Cosmetics Act (FD&C Act) [21 U.S.C. § 350d], which requires domestic and foreign facilities that manufacture, process, pack or hold food for human or animal



consumption in the U.S. to register with FDA. These amendments focused on improving the agency's ability to respond to a food-related emergency quickly and efficiently.⁽⁵⁾

With the establishment of the FSMA, food processors must be inspected within 5 years of its enactment and no less than every three years thereafter. It gives the FDA access to food processors' records including their safety plans and documentation. Finally, it also mandates that certain food testing be regularly performed in FDA-accredited laboratories.⁽⁶⁾

Procedures — CFR 110.80 (b) (17)

Not only do food processors need to be registered with the FDA, they must operate under the Federal Code of Regulations to ensure that the food is suitable for human consumption.⁽⁷⁾ The code states:

All operations in the receiving, inspecting, transporting, segregating, preparing, manufacturing, packaging, and storing of food shall be conducted in accordance with adequate sanitation principles. Appropriate quality control operations shall be employed to ensure that food is suitable for human consumption and that food-packaging materials are safe and suitable. Overall sanitation of the plant shall be under the supervision of one or more competent individuals assigned responsibility for this function. All reasonable precautions shall be taken to ensure that production procedures do not contribute contamination from any source. Chemical, microbial, or extraneous-material testing procedures shall be used where necessary to identify sanitation failures or possible food contamination. All food that has become contaminated to the extent that it is adulterated within the meaning of the act shall be rejected, or if permissible, treated or processed to eliminate the contamination.

The code continues with detailed guidelines regarding the handling of raw materials, frozen foods and liquids, as well as manufacturing operations and sanitation.

Preventive Controls — HACCP and CGMP

As part of the FSMA, the FDA has recently released a proposed rule on preventive controls for human food that focuses on preventing problems that can cause foodborne illness. The rule has two major features: 1) new provisions requiring Hazard Analysis and Critical Control Points (HACCP), and 2) proposed revisions of Current Good Manufacturing Practice (CGMP) requirements under the 21 CFR Part 110.

The HACCP food safety management system requires food processors to have a written safety plan which begins by conducting a Hazard Analysis that identifies the "Critical Control Points (CCP)" — those points, steps or procedures in food manufacturing process at which control can be applied and as a result, a food safety hazard can be prevented, eliminated or reduced to an acceptable level. Once CCPs are



What is HACCP?

HACCP stands for Hazard Analysis and Critical Control Points — a proposed food safety management system of the FDA that analyzes and controls biological, chemical, and physical hazards from raw material production, procurement and handling, to manufacturing, distribution and consumption of the finished product. Currently, there are HACCP procedures developed for dairy, juice, retail seafood, and retail and food service.⁽¹⁰⁾

The Top 8 Food Allergens: ⁽¹¹⁾

While more than 160 foods can cause allergic reactions in people with food allergies, the following are listed as the top eight by law, by the Food Allergen Labeling and Consumer Protection Act (FALCP):

1. Milk
2. Eggs
3. Fish (e.g. bass, flounder, cod)
4. Crustacean shellfish (e.g., crab, lobster, shrimp)
5. Tree nuts (e.g., almonds, walnuts, pecans)
6. Peanuts
7. Wheat
8. Soybeans



identified, food processors can then establish critical limits for each CCP, then continually monitor, take corrective actions where necessary, then validate and document that safe procedures are being followed.⁽⁸⁾

Proposed revisions of the Current Good Manufacturing Practice (CGMP) requirements would also require protection against cross-contact of food by allergens. It would also potentially mandate training and cleaning of non-food contact surfaces of equipment.⁽⁹⁾

Consider the benefits of color-coding.

With the new FDA proposals, many food processors are taking proactive steps by instituting color-coding as part of their Good Manufacturing Practices. Virtually any food processor can benefit from color-coding within its facilities. In particular, color-coding can be particularly helpful for those concerned with pathogens, allergens and other foreign contaminants within their operations. Processors that work with dairy, juice, seafood, or retail/food service may already be using color-coding as part of their HACCP quality control documentation requirements.

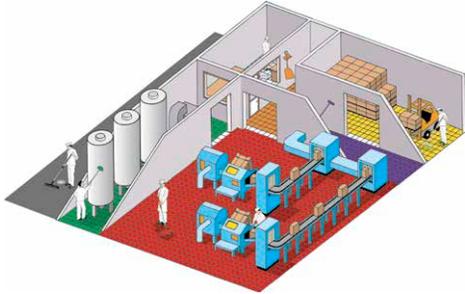
Why use color-coding as part of a food processing operation? First, to avoid cross-contamination by allergens or foodborne illness by providing “zone control” within food processing facilities. Different colors can be assigned to each step in the process or by manufacturing lines, whatever makes sense for the particular food processor. For example, “Green” may be assigned to facilities and processing lines that handle processed or cooked meats, while “Red” may assigned to those handling raw meat. When colors are assigned to zones, confirming that a tool is misplaced is easy and tracing back to its point of origination is quick. This level of traceability can translate to the prevention of costly recalls and deadly illnesses.

Color-coding can also be used to divide workspaces. For example, “Red” could mean “1st Shift” while “Blue” could indicate “2nd Shift.” In this situation, shift employees are taught to understand which colored tools are for their shift, so they’re less likely to use another shift’s tools. The result: reduced incidence of cross-contamination and lost/misplaced equipment.

In cases where the prevention of cross-contamination is of extreme concern, color-coding is commonly applied to the clothing worn by plant workers. In cases like these, every opportunity is taken to color-code in a critical zone.

An emerging trend among food processors is the implementation of color-coding to distinguish cleaning versus sanitation in their maintenance routines. For instance, “Black” is a common color used to identify cleaning tools used on floors and around drains. Other colors can be selected to designate tools that are appropriate for sanitizing food contact surfaces, or to differentiate between tools that are specified for use with particular chemical agents. This practice can also help prevent the undesired occurrence of using a powerful





Sample Color-Coding Systems:

Preventing Functional Cross-Contamination:

Red ■
Raw Meat

Green ■
Processed or Cooked Meat

Preventing Departmental Cross-Contamination:

Yellow ■
Chicken

Blue ■
Seafood

Preventing Allergen Cross-Contamination:

White □
Milk

Green ■
Soy

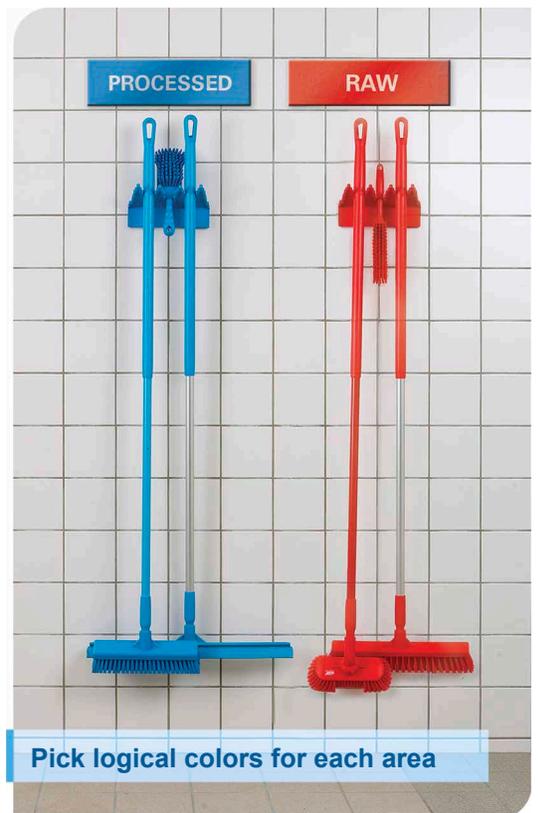
Yellow ■
Wheat

cleaner on the wrong equipment.

A simple, well-implemented color-coding system can benefit a food processor in many ways. First, it can overcome any language barriers. Employees of all ethnicities can easily learn a color-based maintenance system and swiftly put it into action. And there are often fewer questions about where each tool should be used. Second, a color-coded system can instill pride among employees in contributing to a quality end-product. Employees know which color tools are for their area of the facility, or step in the manufacturing process. Third, color-coding can help reduce cost. A system with matching wall brackets encourages employees to properly store their tools. Thus, bristles/handles tend to last longer and the tools are less likely to get lost. Furthermore, an uncomplicated system makes it easier for procurement to order replacement products when needed.

Follow these guidelines to a successful color-coding system.

- **Keep your color-coding system simple** — Limit the number of colors used to as few as possible. Don't try to assign colors for each and every step of a complicated process. A good rule of thumb is to assign one color to each identified Critical Control Point.
- **Pick logical colors per area** — Ensure that the colors you select make sense to your plant supervisors and employees alike. Do particular colors seem to intrinsically symbolize zones or food products processed in your facility?
- **Avoid complicated color assignments** — Mixing brushes and handle colors can sometimes result in confusion; also, if your tools are too customized, it can be difficult to procure replacement tools later.
- **Roll out the color-coding program all at once** — Don't piecemeal your rollout plan; implement your color-coding system within the zones affected all at once; have a definite end date for your old system and start date for your new color-coded system.
- **Good communication is key** — Meet with each of your shift managers first, then roll out the program to employees.
- **Reinforce the color-coding with good signage** — Make it clear (bilingual if necessary); have signs at





each critical point in your process.

- **Be sure your tools and storage areas match** — Make sure the tools are stored in the same area where they are used to further avoid confusion and cross-contamination.
- **Follow through** — Utilize the same documentation at point of use, with your Purchasing Department and with your Quality Manager so everyone is on the same page.

Conclusion.

Heightened food safety regulations are driving the need for documented food safety management systems. As a result, more food processors may consider using color-coding throughout their facilities to help manage food safety risks. It's been shown that with proper implementation, the benefits of a color-coding system can outweigh the costs. In any case, while it is not yet a firm requirement by law, color-coding is often looked upon favorably by customers and inspectors as a practice that shows dedication and due diligence for food safety.

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About Remco

Remco Products is a trusted supplier of a wide selection of high quality color-coded sanitation products made from FDA-compliant materials and ISO-certified to meet the demands of several industries and applications. Remco manufactures injection-molded polypropylene tools such as shovels, scoops, scrapers, tubs, and mixing paddles, and is the exclusive U.S. based distributor of Vikan® color-coded brushes, brooms, squeegees, and handles. Ideal for compliance with today's stringent regulations and HACCP guidelines, these hygienic cleaning tools provide the ultimate step in quality assurance and safety. Remco continues to increase customer loyalty by expanding inventories and maintaining a well-earned reputation for excellent customer service. Visit www.remcoproducts.com for a complete catalog.



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Vikan® is one of the world's leading manufacturers of maximum hygiene cleaning tools with over 115 years of brush-making experience. Based on the needs of our customers and regulatory requirements, Vikan develops, produces and sells a broad range of cleaning solutions which are primarily intended for environments where hygiene and efficiency are essential.

