

Color-Coding as a Preventive Control

Improving Food Safety
and Sanitation Using
Color-Coded Tools

Remco
a Vikon company

We help keep food production
and other hygiene-sensitive
environments cleaner and safer.



Webinar Housekeeping

- ❑ The presentation will last for about 45 minutes. Please ensure that your mic system is on mute during the webinar.
- ❑ After the presentation, there will be a 10-15 minute Q&A session. You may send your questions in the chat box provided.
- ❑ This webinar is being recorded and we will send you the recording a few days after the live event.



About Our Presenter

Amit M Kheradia

Education and Technical Support Manager

- Over 15 years of experience in food safety, quality, and processing technology.
- Worked for SMEs and Fortune 500 companies in North America and Africa.
- Conversant with HACCP, U.S. FDA FSMA, Canadian food regulations, and global food safety standards.
- Academic Qualifications:
 - MSc Food Safety & Quality Assurance, University of Guelph, Canada
 - BSc Food Science and Technology, University of Nairobi, Kenya



About Remco and Vikan



OF FULLY COLOUR CODED
CLEANING TOOLS



- Leading provider of advanced hygiene and cleaning products and solutions for key sectors, with a global presence in over 90 countries.



- Supplies color-coded sanitation and material handling tools for the food industry in North America.

For more information, visit us at: remcoproducts.com/about

Webinar Outline

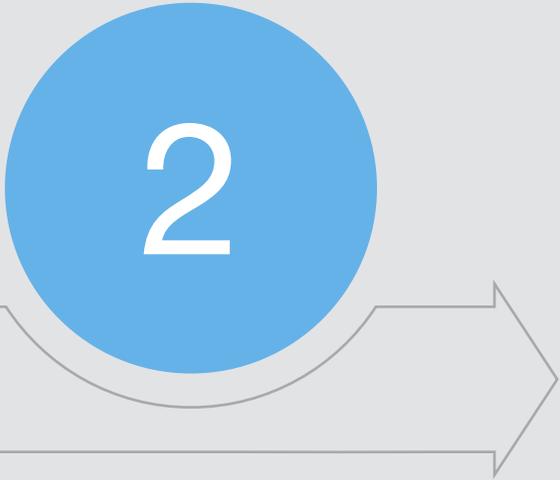
Color-Coding as a Preventive Control:

Improving Food Safety and Sanitation Using Color-Coded Tools



1

Regulations, standards, guidelines, and benefits of color-coding as a preventive control



2

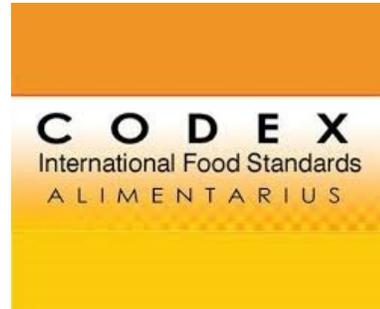
Model Case Study:
Application of color-coded tools in a typical cookie manufacturing facility



3

Tips on how to develop and sustain a robust color-coding plan

Focus on the Preventive Controls



Preventative Measures are taken to reduce the risk of unsafe food by... controlling biological, chemical and physical food safety hazards.

Interpreted from: Section 5 – Control of Operations, CODEX Food Hygiene, Basic Texts, 4th ed.



A **Preventive Control (PC)** is a risk-based assurance that... that the food manufactured, packed, or held by a facility will not be adulterated or misbranded... Includes other procedures, practices and processes that satisfy the requirements of a PC

Interpreted from: 21 CFR 117.135 on 'Preventive Controls'

Take-away: Color-coding can be a best-practice for controlling contamination incidents in facility.

Color-Coding: What do Regulations Say?



21 CFR 117.80 – Processes & Controls (Modified GMPs according to FSMA Regulations)

All reasonable precautions must be taken...
to prevent allergen cross-contact and
contamination...
Raw materials, ingredients, work-in-progress
materials and food products are segregated...



European Commission, EC Regulation **852/2004**

Require food processors to have a written food
safety plan ... and implementation of control
measures

Take-away: Color-coding can be used as one of the effective control measures, segregation or precaution strategy.

Color-Coding: What do the GFSI Based Standards Say?



BRC Global Standard for Food Safety Issue 8

color-coding for identification of cleaning equipment {See Clauses 4.9.4.2 and 4.11.6}



SQF Code Edition 9 on Food Manufacturing

separation of functions, ingredients, materials, products, and zones based on risk {See Element 11.7}



FSSC 22000 Version 5.1

dedicated cleaning tools {See section 8.5}



IFS Food Standard 7

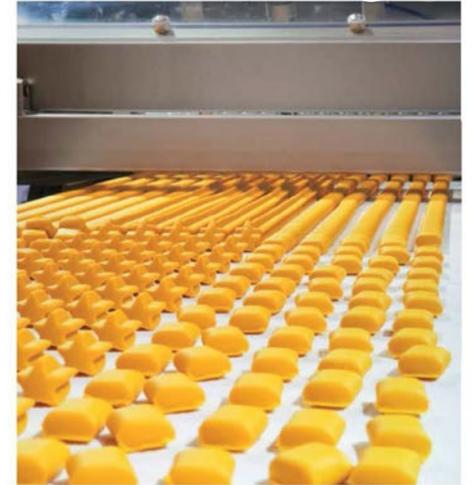
cleaning equipment must be clearly identified

Take-away: Color-coding is mentioned as well as implied as one of the **Best-Practices** in global standards

Food Safety Modernization Act Guidance on Human Food

The recently issued “Preventive Controls for Human Food” Manual recommends at least the following best practices:

- Color-coded uniforms, smocks, footwear and clothing
- Color-coded containers
- Color-coded equipment
- Color-coded tools
- Color-coded labels
- Color-coded facility maps

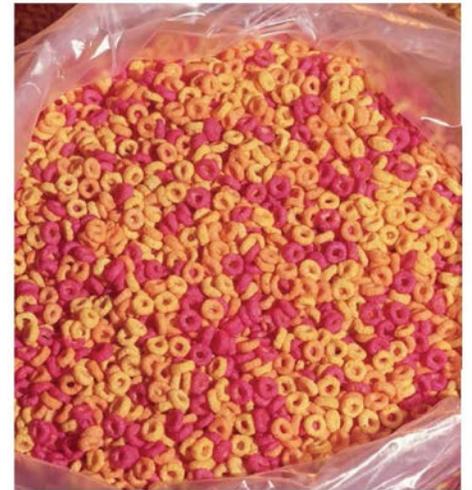


FSPCA

FOOD SAFETY PREVENTIVE CONTROLS ALLIANCE

**Preventive Controls
for Human Food**

First Edition - 2016



Participant Manual



About 1 in 3 Food Recalls in North America happen because of contamination incidents within a facility, which are preventable

Benefits of a Color-Coding Program

- ✓ Prevents cross-contamination of food
- ✓ Helps comply with regulations and standards
- ✓ Improves hygienic zones
- ✓ Supports environmental monitoring
- ✓ Provides a visual cue on process status
- ✓ Items can be identified and inventoried
- ✓ Helps overcome employee language barriers
- ✓ Aids in 5S workplace management system
- ✓ Streamlines the tool management program

https://www.vikan.com/media/8428/2019_jafp-poster_amitmkheradia-us.pdf

Importance of a Color-Coded Tool Management Program



Tool Identification could significantly impact and support its selection, usage, cleaning, storage, maintenance and replacement frequency considerations within a food plant

CASE STUDY:

On Application of Color-Coded Tools

Model case-study: Cookie Processing Facility that manufactures two RTE products for general public:



Plain Cookies



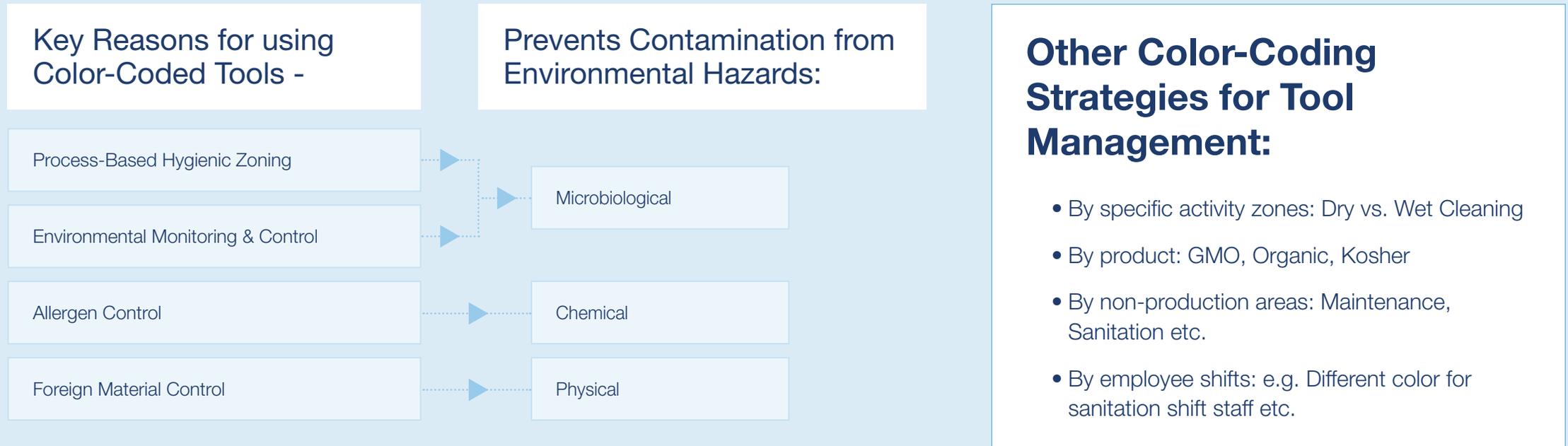
Chocolate Chip Cookies

- Low water-activity product in which pathogens may survive, and molds can grow
- Historically associated with allergen cross-contact and foreign material cross-contamination
- Product contains Wheat, Milk, Egg and Soy. Soy is unique allergen - ONLY found in chocolate-chip cookies
- Dry powders and Liquids are handled during ingredient preparation
- A combination of Dry- and Wet Cleaning is conducted at the facility

TASK: Develop a Color-Coding Plan within the Tool Management Program



Scope of the Case-Study

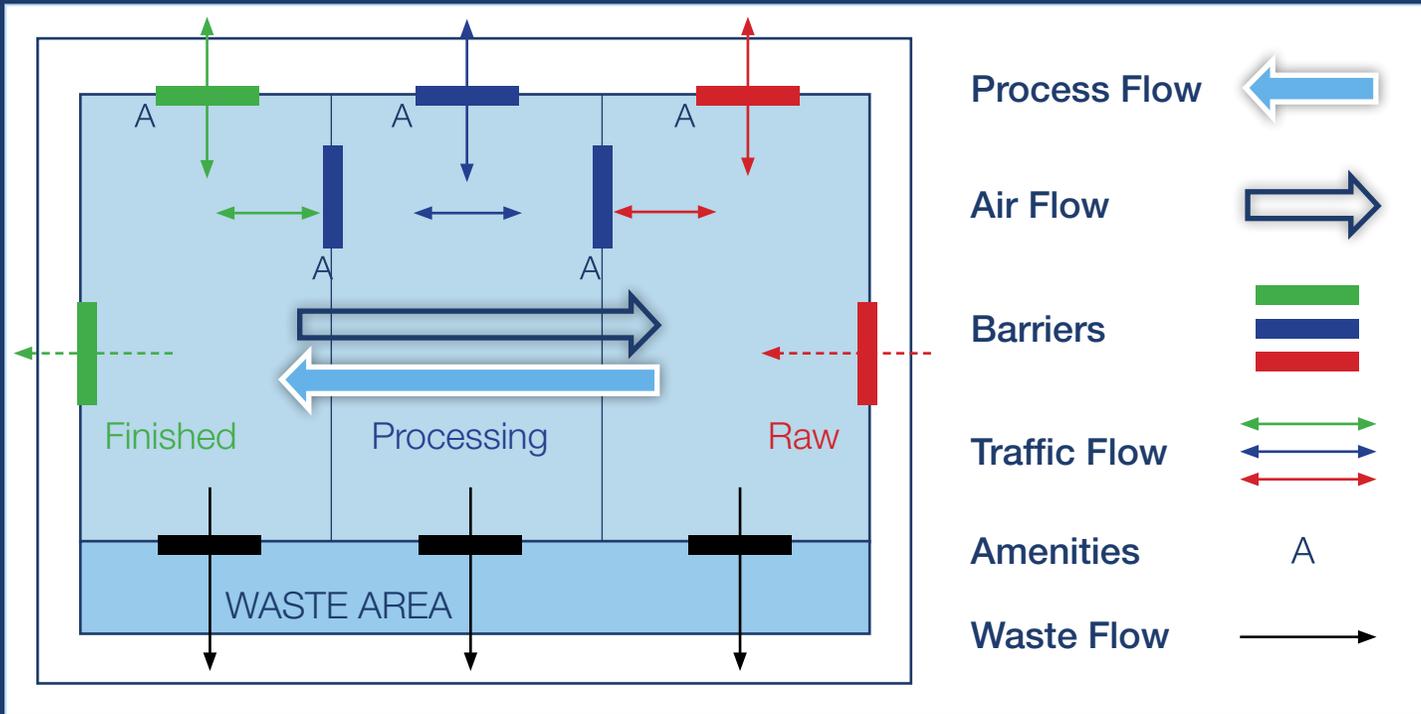


Color-Coding Considerations

- **Form a Multidisciplinary Team** – Discuss food safety and sanitation issues
- **Assess Risks** – Use the Visual Site Map to find the trouble-spots
- **Establish Controls** – Consider Color-Coding as a preventive control
- **Get Employee Buy-in** – Educate and Train
- **Sustain** - Review the Color-Coding Program

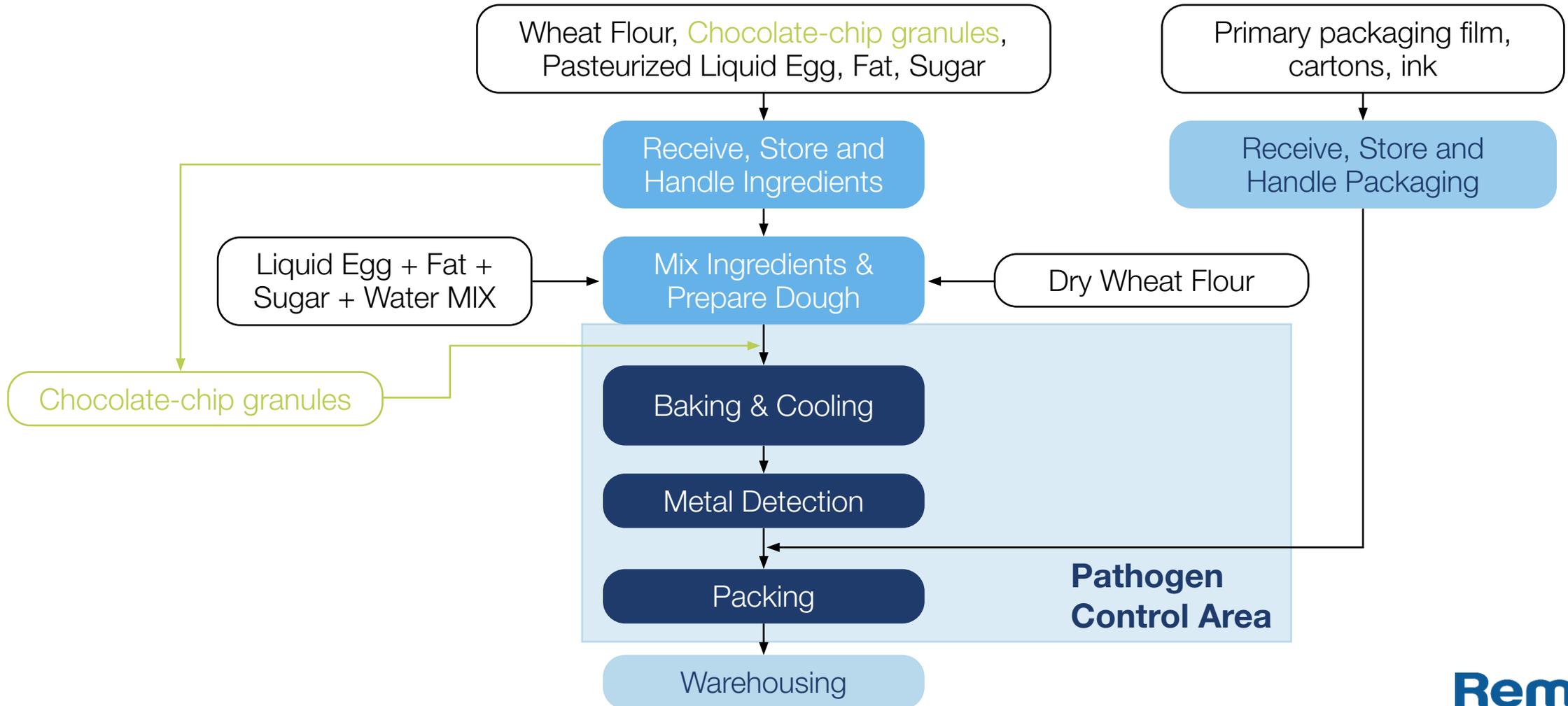


Visual Site Map

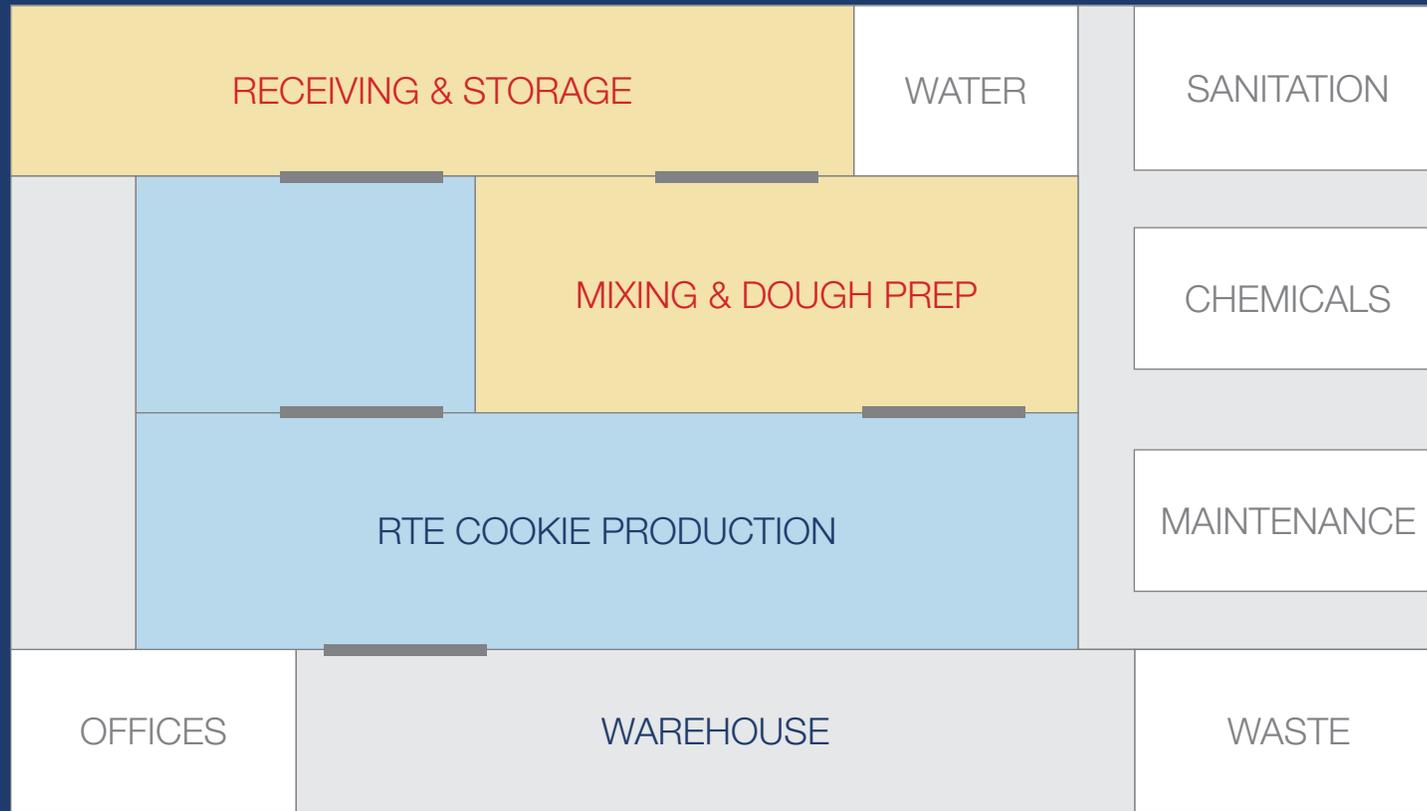


- Also consider
- Product Flow (Inputs, Work-in-Progress, Final Product)
 - Chemical Flow
 - Water Flow
 - Information Flow

Cookie Mfg. Process Flow Diagram



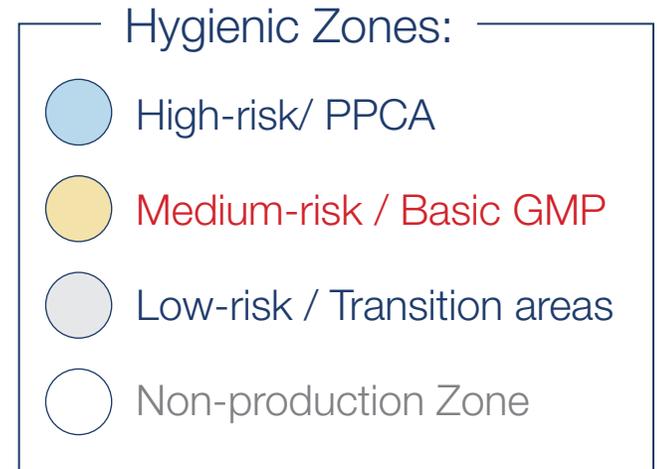
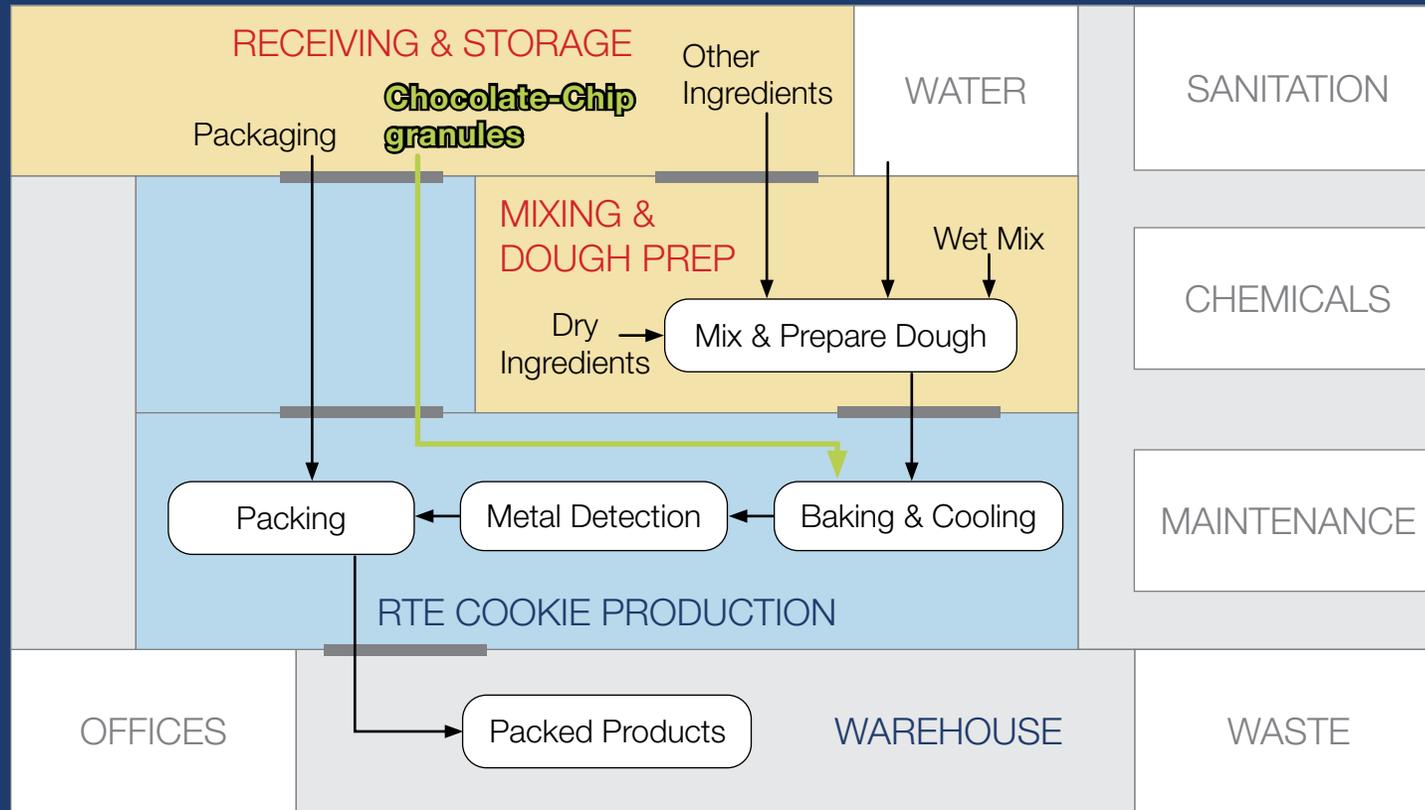
Hygienic Zoning of the Plant Map



Hygienic Zones:

- High-risk/ PPCA
- Medium-risk / Basic GMP
- Low-risk / Transition areas
- Non-production Zone

Include Flow Chart into Hygiene Zone Map



Appreciating The Power of One Color

Color-Coding as one of the differentiating features for the tools

Ceiling/ Overheads



Floors



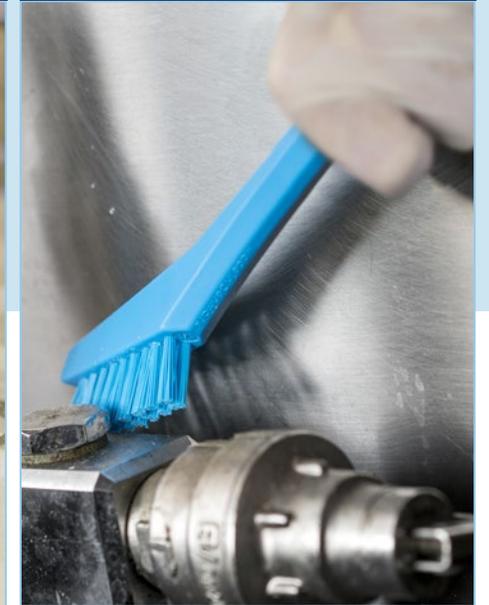
Conveyors



Prep-tables



Nooks and crannies



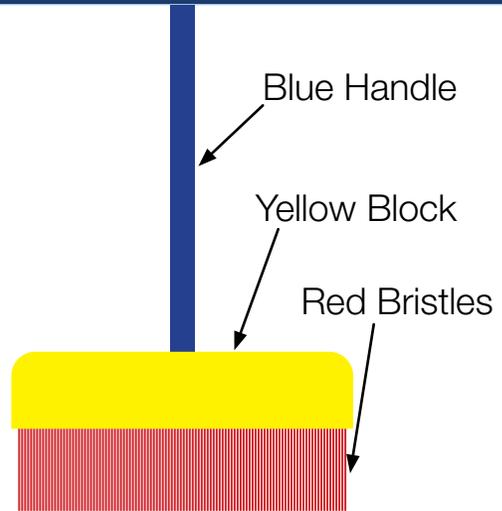
You are entering a **HIGH-RISK PRODUCTION ZONE**

The Reason behind ‘Total-Color’ Tools

Easy to Identify, Allocate, Monitor and Replace if a non-conforming tool is to be taken out of service:

Conflicting Colors

Tools that are made of various different colors are not easily identifiable in a color-coding scheme. To which color zone does a multi-color tool belong?



Total-Color Broom

The ideal solution is when the entire tool uses a single color, from handle to block to bristle.



Notable Exceptions

Tools, such as tube brushes, with a common stainless steel shaft are easily IDENTIFIABLE.



Maintaining the Integrity of Process-based Hygienic Zones

Every year, *Listeria* and *Salmonella* cross-contamination incidences are significantly responsible for food illness outbreaks and food recalls in North America and globally.



MIXING & COOKIE DOUGH PREP

- **Medium Risk**
 - spoilage organisms and foreign material



BAKING & RTE COOKIE PACKING

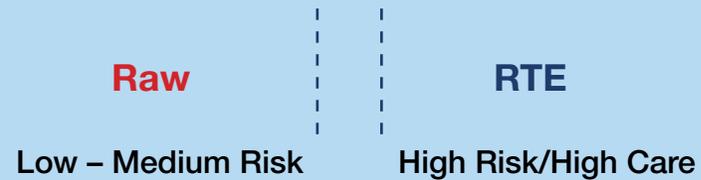
- **High Risk**
 - pathogens, allergens & foreign material

Hygienic Zoning Vs. Environmental Monitoring



HYGIENIC ZONING

A risk-based concept of separating facility areas/processes



Note: Flow elements (i.e., shown in slide # 15) can dynamically influence hygienic zones



ENVIRONMENTAL MONITORING

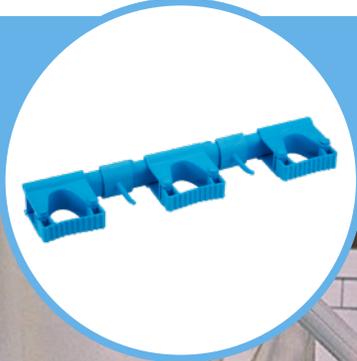
A microbiological sampling and trending program

| ZONE | Example |
|------|--------------------------|
| 1 | Food Preparation Table |
| 2 | Ceiling above Prep Table |
| 3 | Wall/Floor in Production |
| 4 | Warehouse Floor |

Not Product Testing

Tools for Environmental Monitoring Surfaces

Food-contact (FCS) tools must not be mixed with non-food contact (NFCS) tools and hence must be identified and stored separately:



Food Tanks



Drains



Preventing Allergen Cross-Contact Incidences

- According to Gendel et al. (2014), Allergen-cross contact incidences account for about 12% of allergen-related recalls
- **Color-coding** can be an effective preventive allergen control strategy when used in tandem with other interventions:
 - » The greatest threat of the unique allergen is at RTE zone where chocolate chip granules (containing soy) are being introduced:



soy-based ingredients



other ingredients

Gendel, S. M., Zhu, J., Nolan, N., & Gombas, K. (2014). Learning from FDA food allergen recalls and reportable foods. Food Safety Magazine, 20, pp. 46-52

U.S. BIG 8 ALLERGENS



MILK



EGGS



FISH



SHELLFISH



TREE NUTS



PEANUTS



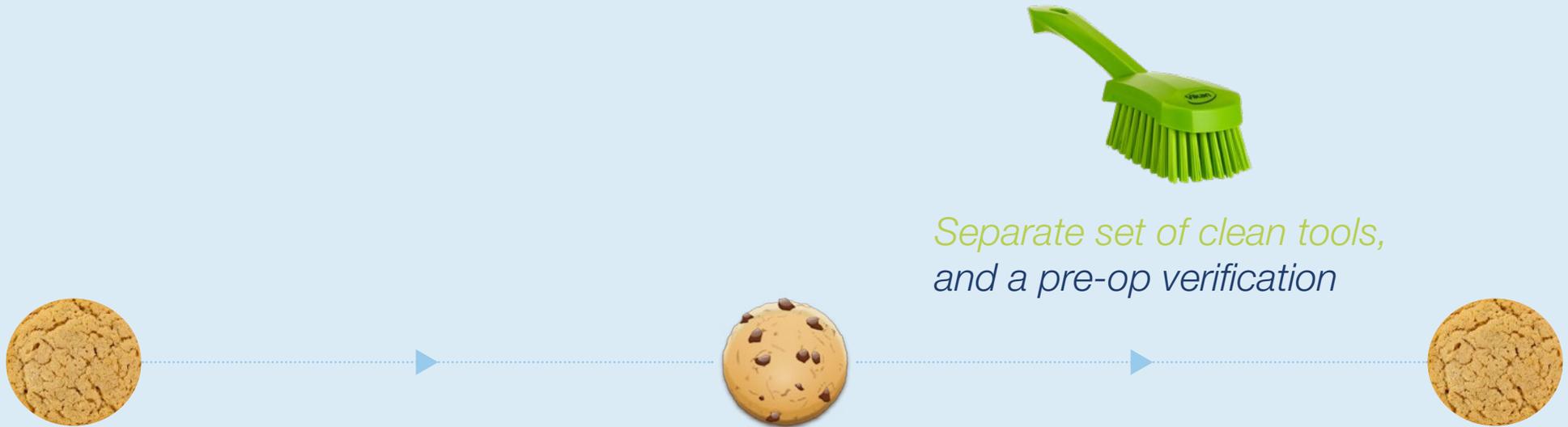
WHEAT



SOY

Sesame
Labeling by Jan. 1, 2023

Proper Scheduling of Production and Cleaning



Do a full allergen clean before switching from allergen-containing to non-allergen containing product.

Foreign Material Control

FSIS and FDA recalls due to foreign material hazards are on the increase. In 2019, 50 of the 337 recalls (14.8%) in USDA's archive were for foreign material contamination

FSIS-USDA Recall Archive, 2019

OTHER Interventions

- Tool cleaning & inspection
- Replace non-conforming tools
- Metal detectable tools e.g., scoops
- UST brushes with secure bristles
- High-temperature resistant tools for hot surfaces
- Chemical-resistant tools for cleaning drains etc.

Use Contrasting Colors

Enables you to spot plastic fragments or stray bristles from equipment in the food

Color-Coding & 5S

Color-coding is a powerful 5S visual technique which facilitates the implementation of GMPs that is responsible for 85% of food safety system failures:



5S in the Food Industry:

<https://viewer.ipaper.io/vikan/white-papers/5s-in-the-food-industry/5sfoodindustryen/>

Sort

Select what tools are needed for the job and remove everything else from the work area

Set in Order

Arrange tools so they are easy to select, use, and return to their proper location

Shine

Spot dirty, non-conforming tools and then clean, repair or remove them from service

Standardize

Develop & implement a visual, e.g., a color-coding plan that employees can consistently follow

Sustain

Create a food safety culture among employees so they can work towards contamination prevention



Universalism of Colors and How to Overcome its Limitation

Use Color-blind Friendly Combinations

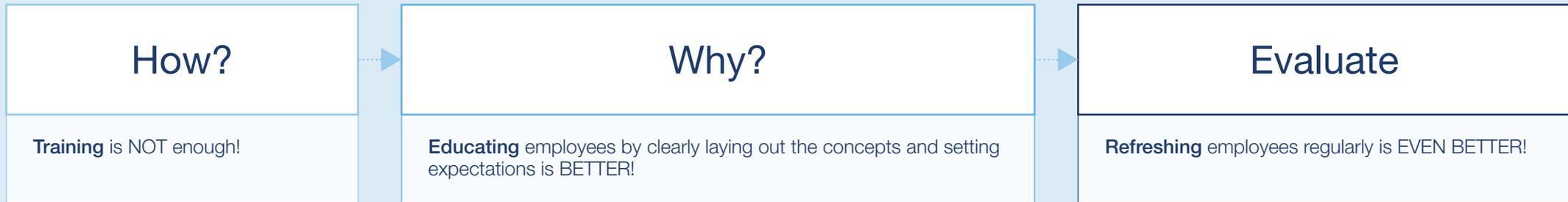
- 1 in 12 men and 1 in 200 women are color-blind
- Use different shades and contrasts to make it easier for color-blind staff to differentiate colors
- If in doubt convert the photo colors into black and white. If you can tell the difference, the shade differentiation is strong enough



| | |
|---------|--------------|
| English | blue |
| French | bleu |
| Spanish | azul |
| Danish | blå |
| Hindi | नीला (neela) |



Education and Training of Employees – Fostering Food Safety Culture



The Right Way



Refresh for consistency

Using Tools, The Wrong Way



Re-educate + Re-train

A Change In The Program



Re-develop Plan + Re-educate + Re-train

Communicate using SOPs

EXAMPLE: Color-Coded Tools used at RAW Vs. RTE Zones

- **WHY color-code tools?** Prevent contamination
- **WHAT are we coding?** Scoops and Tubs
- **WHERE are we doing this?** RAW vs. RTE Zones
- **HOW are we color-coding?** Red for RAW; Blue for RTE
- **WHEN are we using tools?** During production. Use lime-colored tools on food-contact surfaces at RTE when making chocolate-chip cookies
- **WHO is responsible for using the tools?** Trained food handlers in allocated areas



Communicate using a Food Safety Plan

| Material / Step | Hazard and Risk Score | Control Type & Justification | Monitoring Action | Corrective Action | Verification Action | Records and Reviews |
|--|---|--|---|--|---|--|
| Adding chocolate chip granules to cookie dough | <p><i>Allergen cross-contact: Soy in plain cookies</i></p> <p>High risk: may lead to Class 1 Recall of soy-free products</p> | <p>Allergen Control</p> <p>Sanitation Control</p> <p>Color-Coding: Separate processes of handling non-soy and soy-based ingredients</p> | Supervisor ensures trained operators use lime-colored handling and cleaning tools for dealing with soy-based products (once/shift) | <p>If scoops are accidentally switched:</p> <ul style="list-style-type: none"> i) Stop production ii) Separate and dispose affected product from the good batches iii) Thoroughly clean scoops before reuse iv) Start production v) Document action vi) Prevent through education and training & process redesign | <p>QC takes sample allergen swabs before switchover to check if surfaces are “allergen clean”</p> <p>QC checks if operators are following the allergen handling process (twice/shift)</p> | <ul style="list-style-type: none"> • Color-Coding Map • Allergen Control Plan • SSOPs <p>Color-Coding plan reviewed at least annually or whenever there are significant changes in processing</p> |

Communicate using a Color-Coding Plan

COLOR-CODING PLAN FOR TOOLS USED IN COOKIE MANUFACTURING COMPANY, XYZ INC.

| Color Scheme | Area/Zone/Process | Key Comments |
|--------------|-------------------------------------|--|
| Red | Receiving, Storage and Mixing Areas | Medium-Risk Zone |
| Blue | RTE | High-Risk Zone |
| Black | Floors and Drains | At Medium and High-Risk Zones |
| Lime | Allergen Zone | When dealing with Soy at RTE at Food-Contact Zones |
| Gray | Warehouse and Corridors | Low-Risk Zone |

Color-Coding Tips

Keep it simple.

Be consistent.

Communicate the plan.

Contact Remco for help.

More Information...



- Part of allergen control plan
- For hallways and corridors
- Can replace wooden tools

Color-Coding Toolkit available at:
<https://remcoproducts.com/toolkit/>



Hygienic Zone Planner App

<https://www.vikan.com/int/knowledge-centre/site-survey/>

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