

Food Safety Summit 2023

Recent advances in sanitation for the prevention and control of food safety hazards

Sanitation discussion *A Nestlé Perspective*

David Clifford
Director, Food Safety Nestlé USA

May 2023



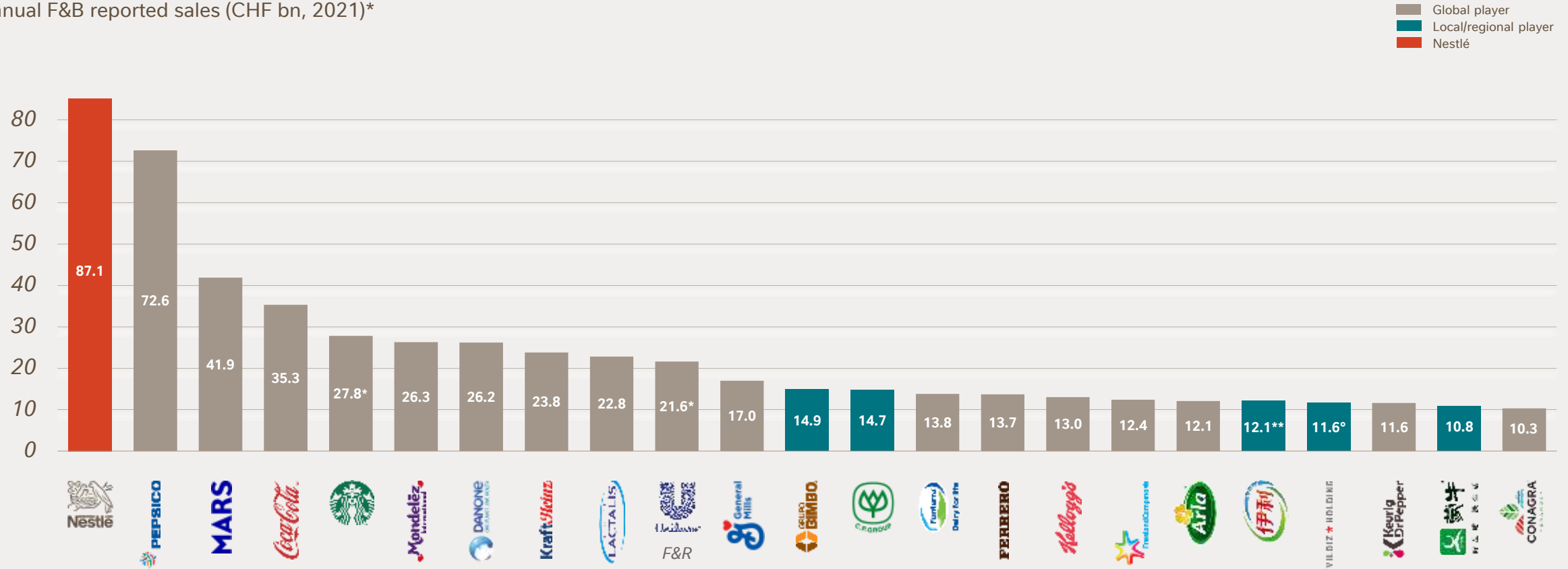
What story is being told in your factories every day?



Nestle is leading in a highly competitive market

The CHF>10bn Food and Beverages companies 2021

Annual F&B reported sales (CHF bn, 2021)*



NB: Mars & Lactalis figures are estimates. Unilever figure is F&B sales only
 * Computed with last 4 quarters available (different fiscal year) / ** 9M 21 / ° 2016 result

Nestlé US brands are in 97% of households





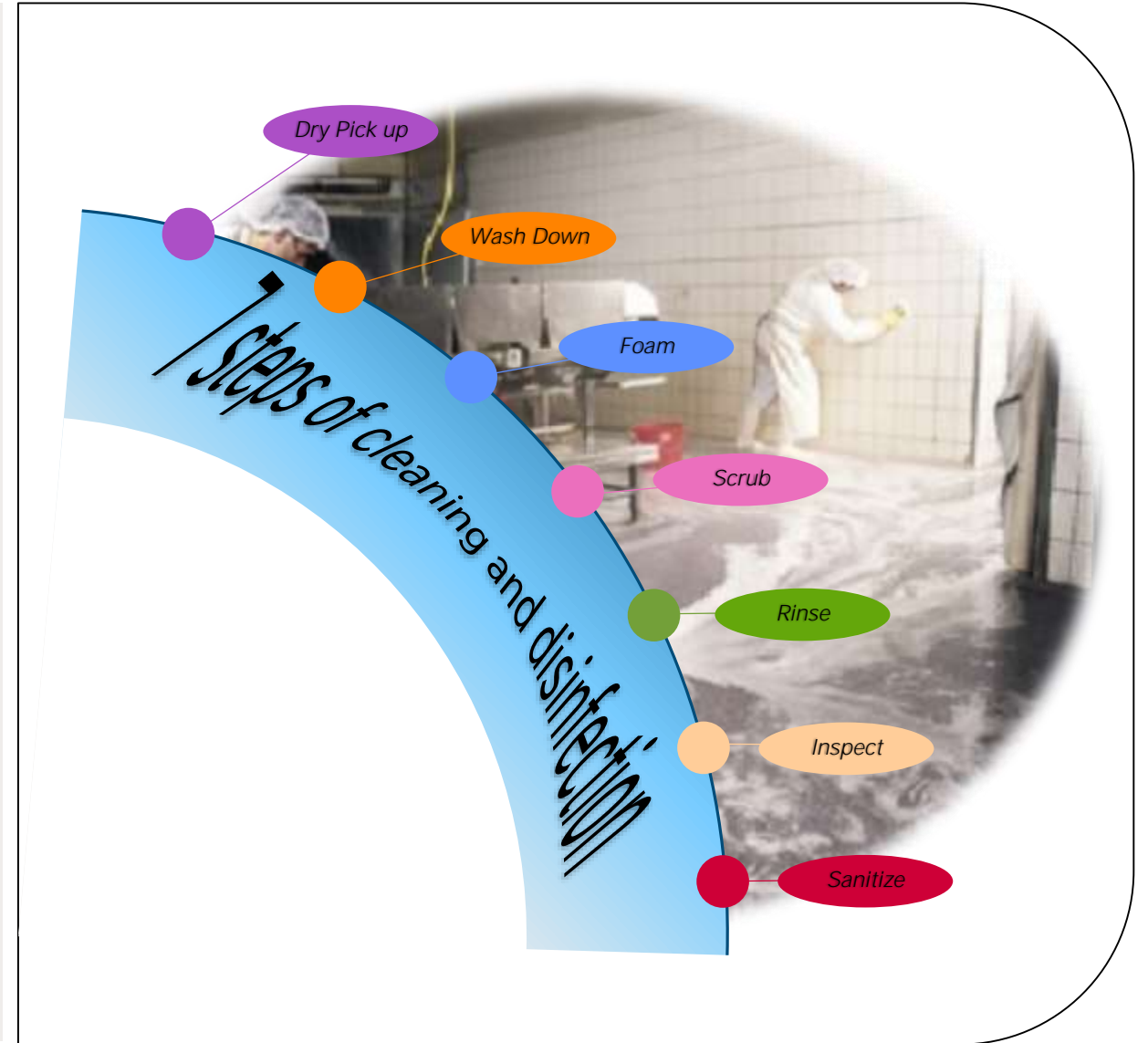
NESTLÉ IN THE U.S.

- 7 operating companies
- 34 states
- 68 manufacturing facilities
- About 36,000 employees
- Largest market for Nestlé globally

Cleaning and Disinfection

First thing we do...

...Or last thing we do?



Cleaning and Disinfection



- *Why are we cleaning?*
- *When are we cleaning?*
- *How are we cleaning?*



Cleaning and Disinfection

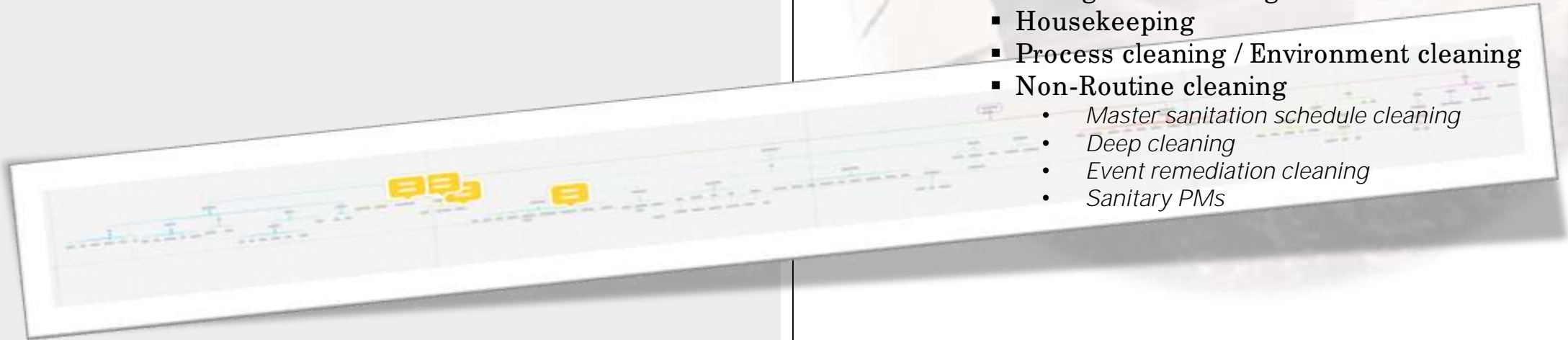


Cleaning methods (how)

- Wet/Controlled Wet
- Dry
- CIP/aCIP/COP/Manual
- Alternative methods

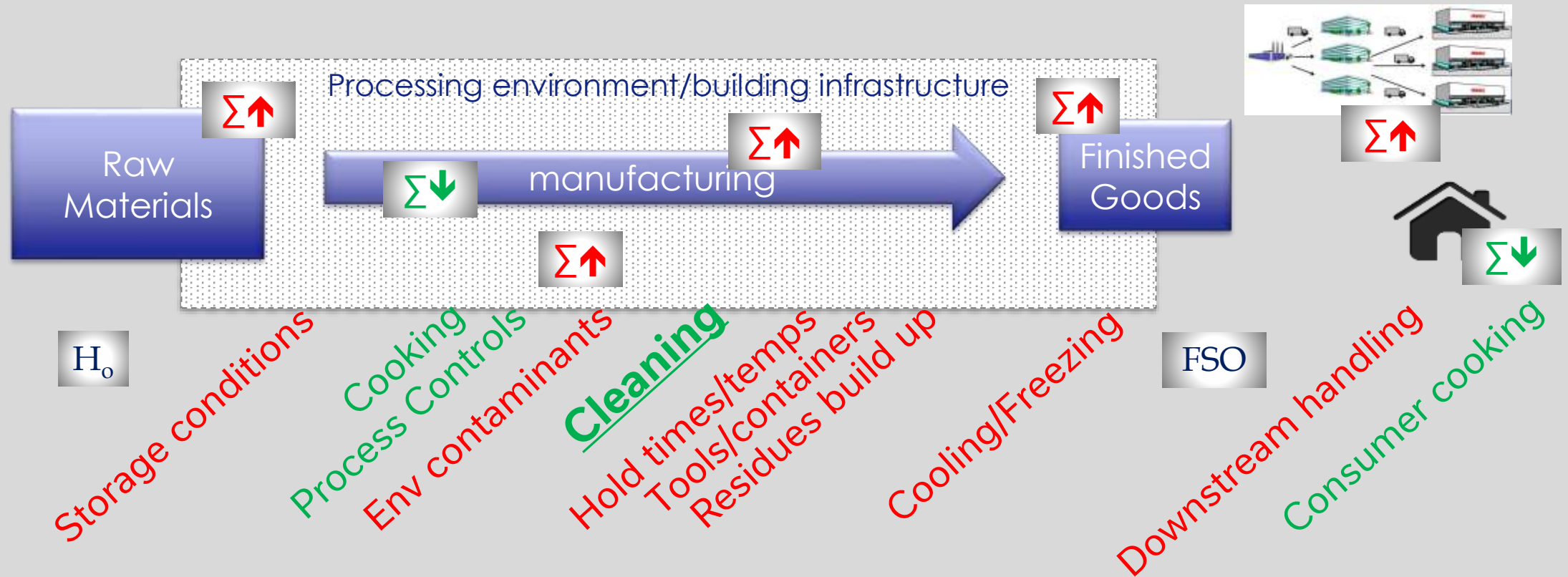
Cleaning types (why and when)

- Full cleaning
- Intervention cleaning
- Changeover cleaning
- Housekeeping
- Process cleaning / Environment cleaning
- Non-Routine cleaning
 - *Master sanitation schedule cleaning*
 - *Deep cleaning*
 - *Event remediation cleaning*
 - *Sanitary PMs*

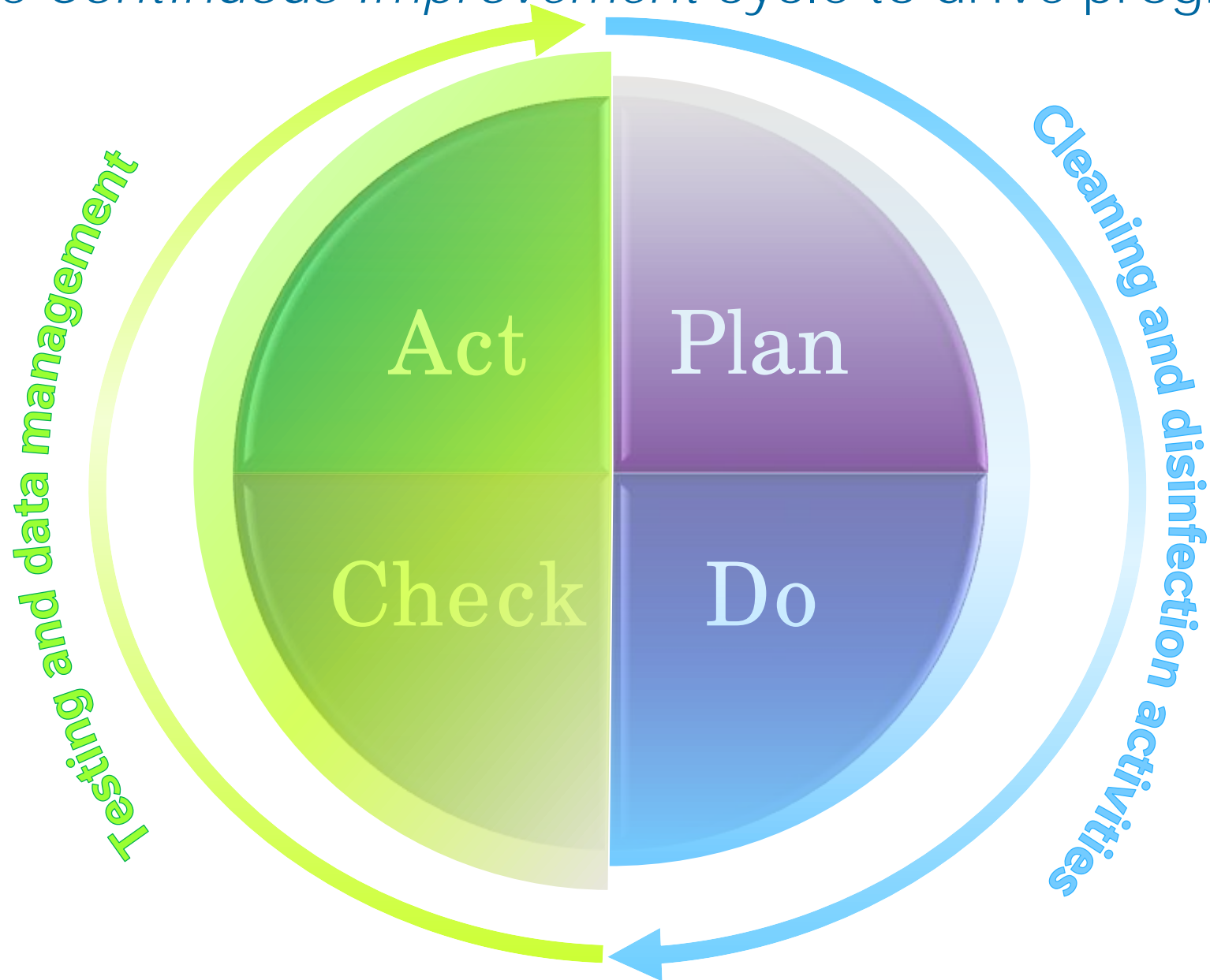


The mathematics of operational microbiology

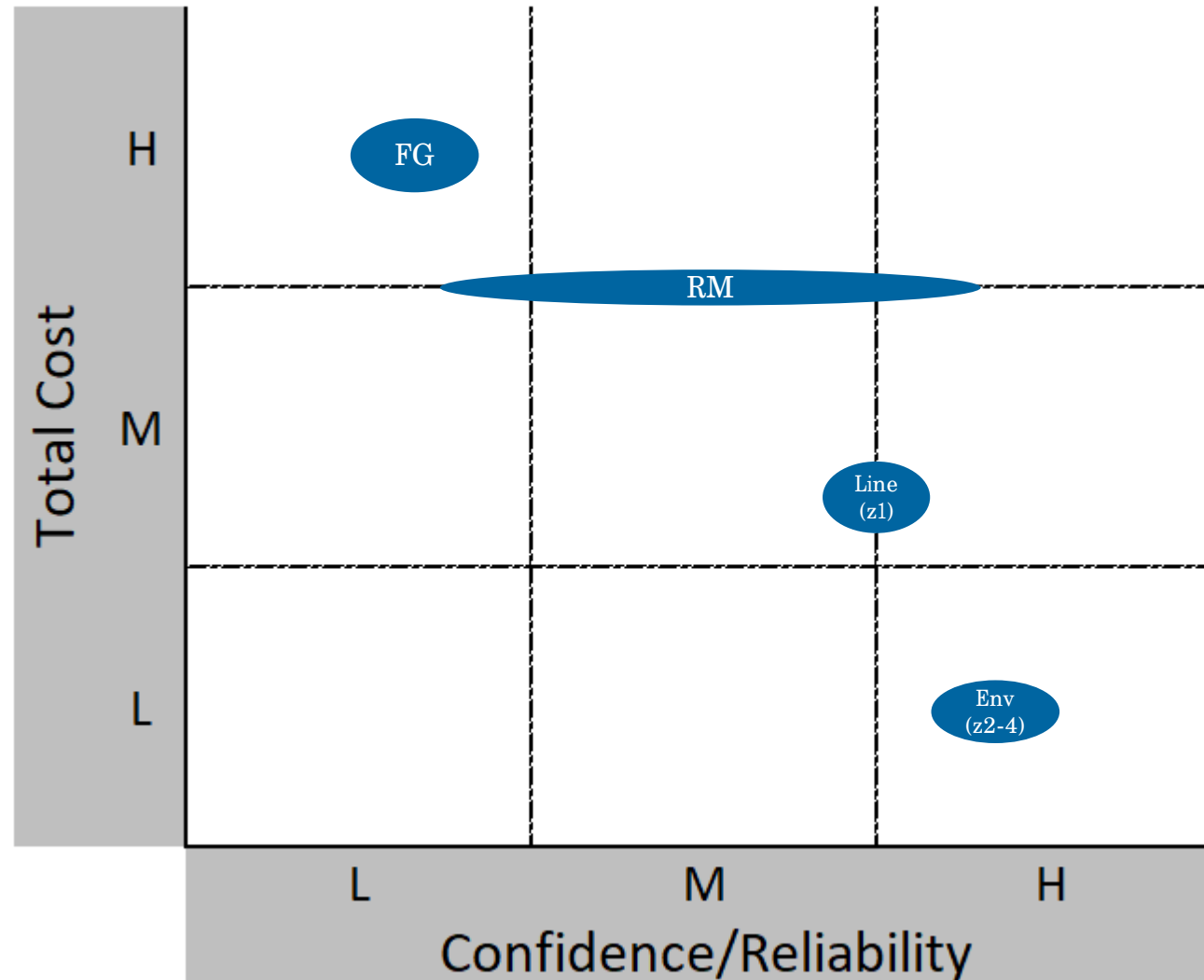
$$H_0 - \sum R + \sum I \leq FSO$$



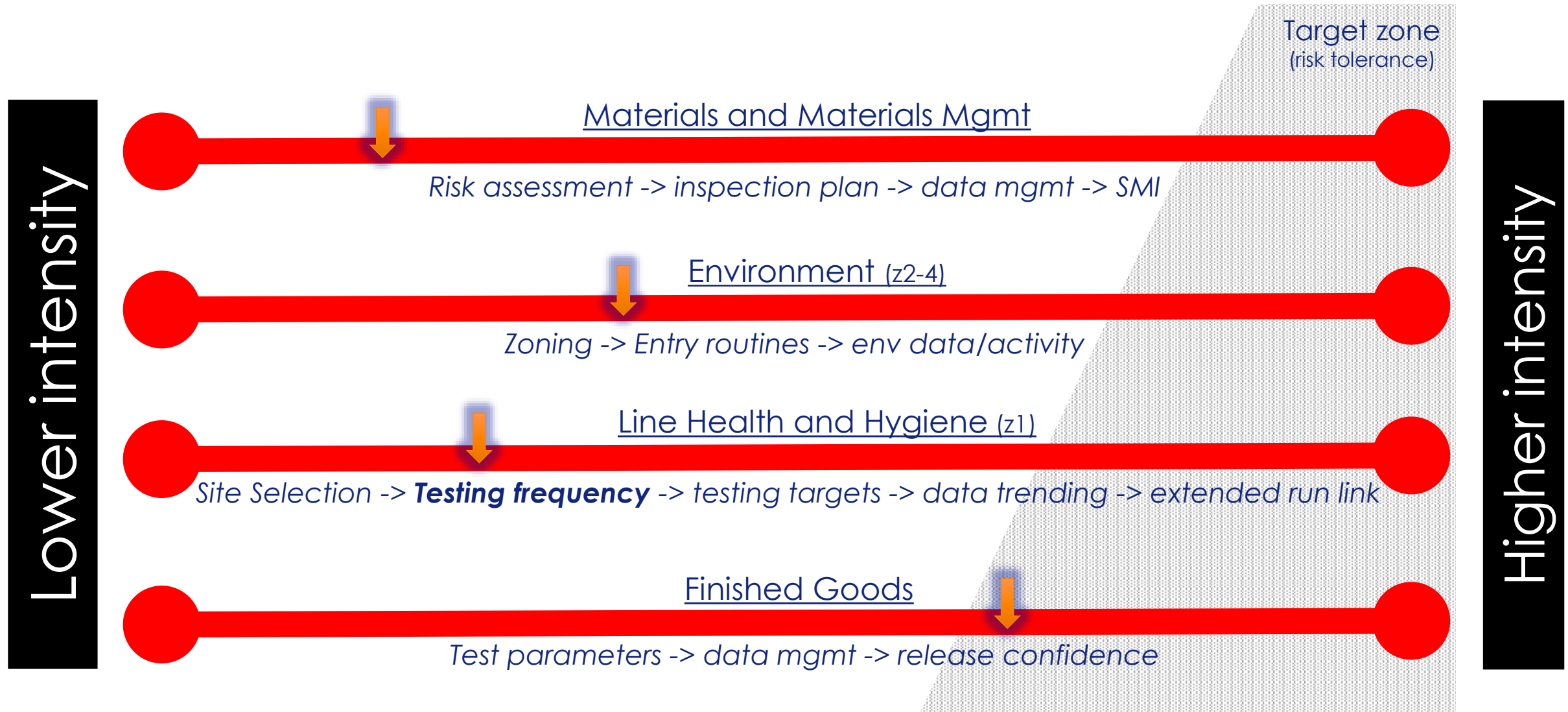
Leverage the *Continuous Improvement* cycle to drive progress



Does your testing program give you what it promises?

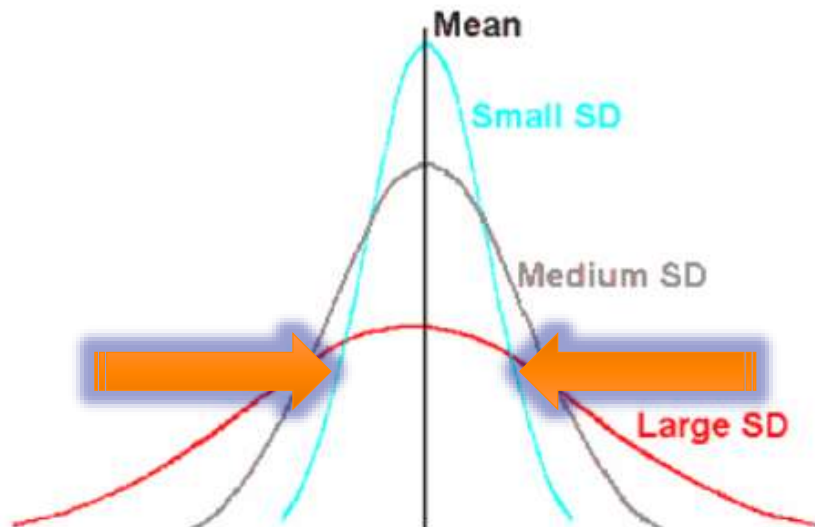
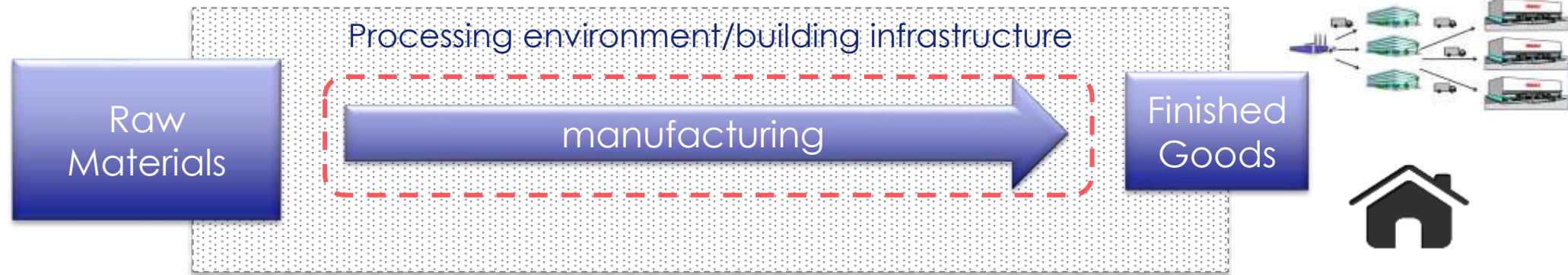


Does your testing program give you what it promises?



↓ = for illustration purposes only, generalized system performance/health position. Will vary by each factory site

Does your testing program give you what it promises?



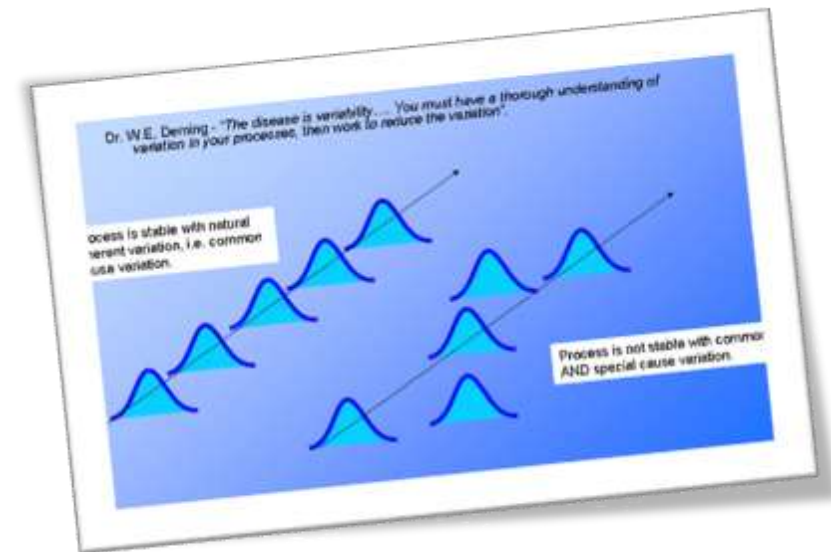
Large standard deviation (SD) –

- due to wide variability
- promotes intervention cleans
- discourages maximizing production time
- drives high risk of nonconformance
- difficult to justify

“Pathogen Monitoring Modernization”

Transforming our approach to verification testing to improve sanitation and unlock production efficiency

- Process Release
 - Emphasis on process control
 - Normalize transient ‘noise’
 - Process confidence, high data reliability
- TPM/Lean Manufacturing
 - Process Capability
 - Defect elimination / Data intelligence
 - Catalyze capability building/build autonomy
- Reduce microbiology holds/events
 - Detect change early; REACT
 - Custom target setting
 - Minimize supply chain disruption



Factory Process Health Data

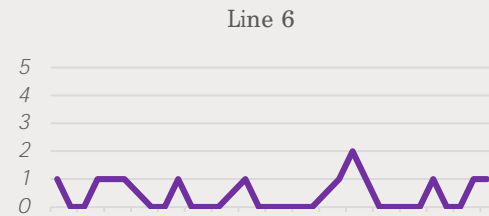
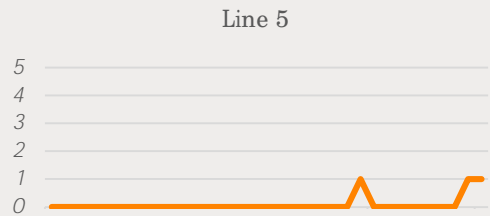
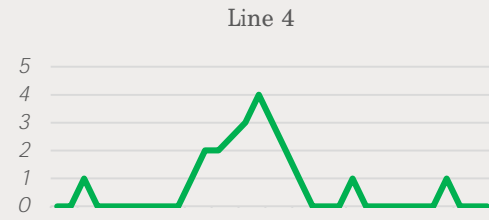
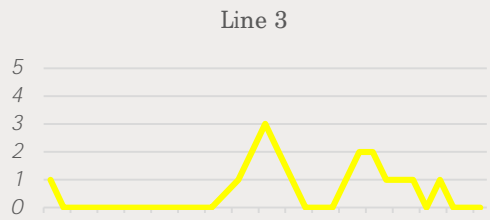
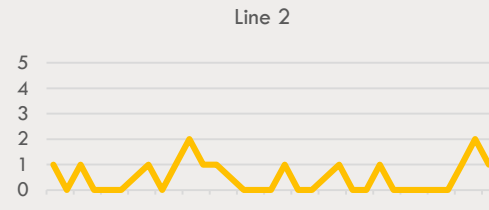
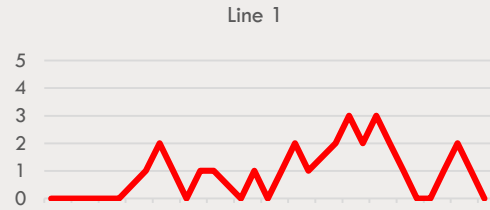
Capability study // *Enterobacteriaceae*

- **Map line for strategic test sites (z1)**
- High Frequency Testing / around the clock / 30-90 days
- Establish 'controlled performance' criteria
- **Re-establish testing frequency**
- Daily data review + trend analysis (establish routines)
- **ATTACK THE BOTTLE NECKS**
- Sustain performance



Factory Process Health Data

15wk period // *Enterobacteriaceae*



- 6 frozen meal lines
- same facility; same period

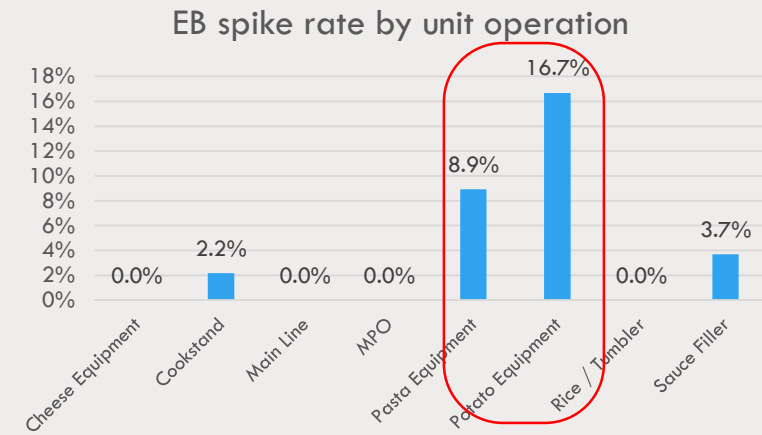
Factory Process Health Data

15wk period // *Enterobacteriaceae*



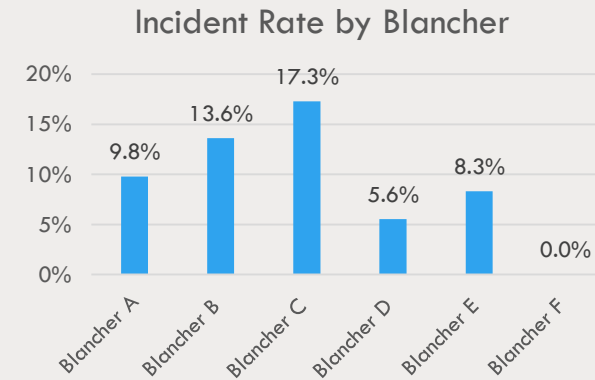
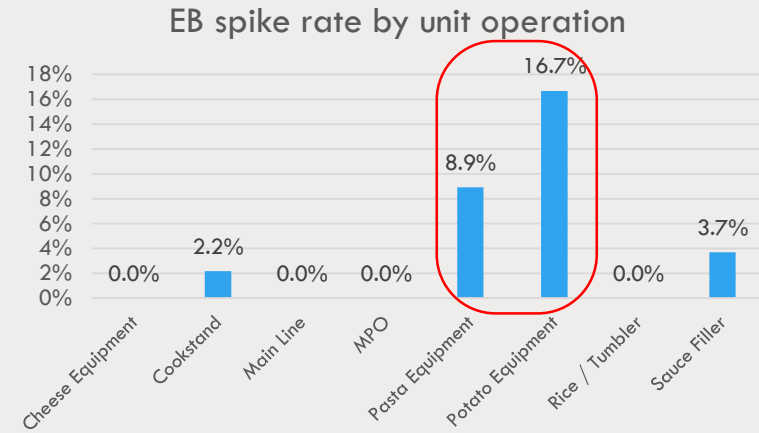
Factory Process Health Data

15wk period // *Enterobacteriaceae*



Factory Process Health Data

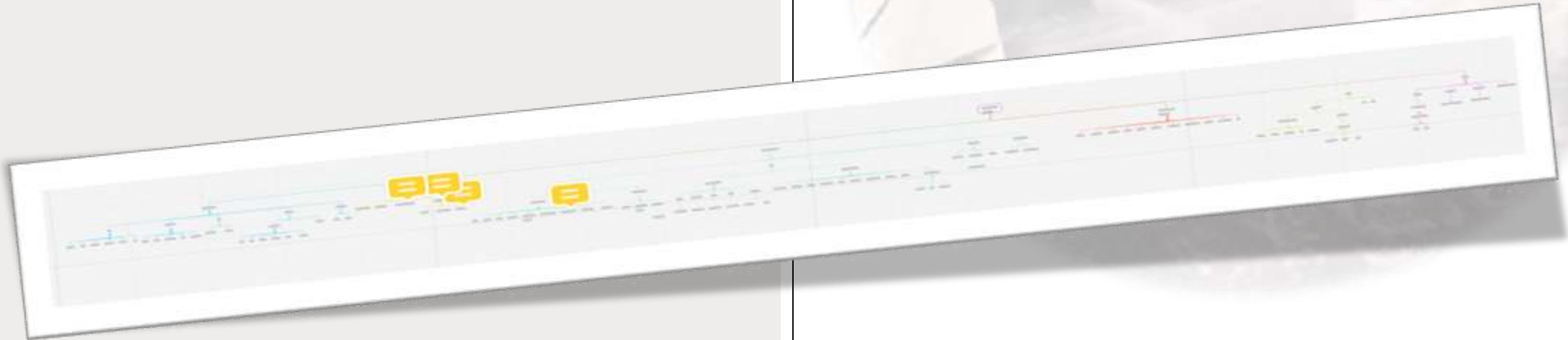
15wk period // *Enterobacteriaceae*



Cleaning and Disinfection



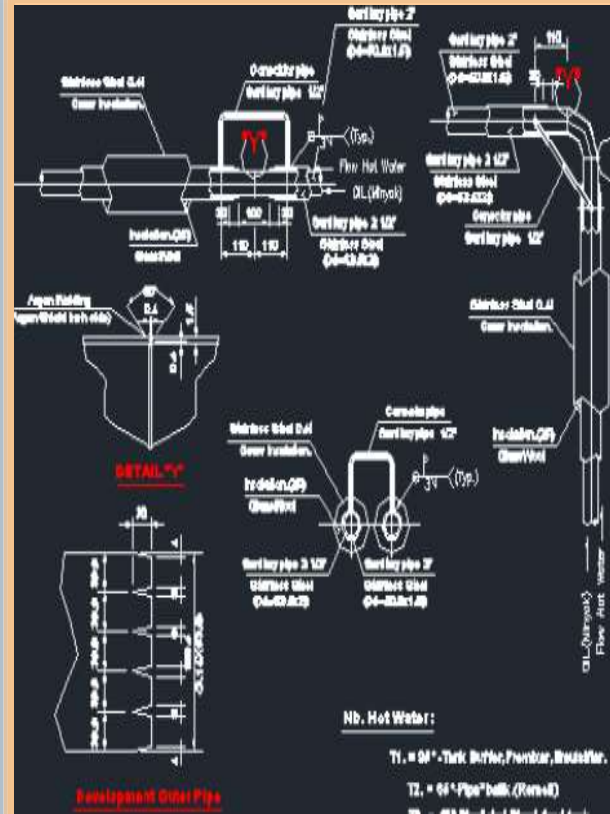
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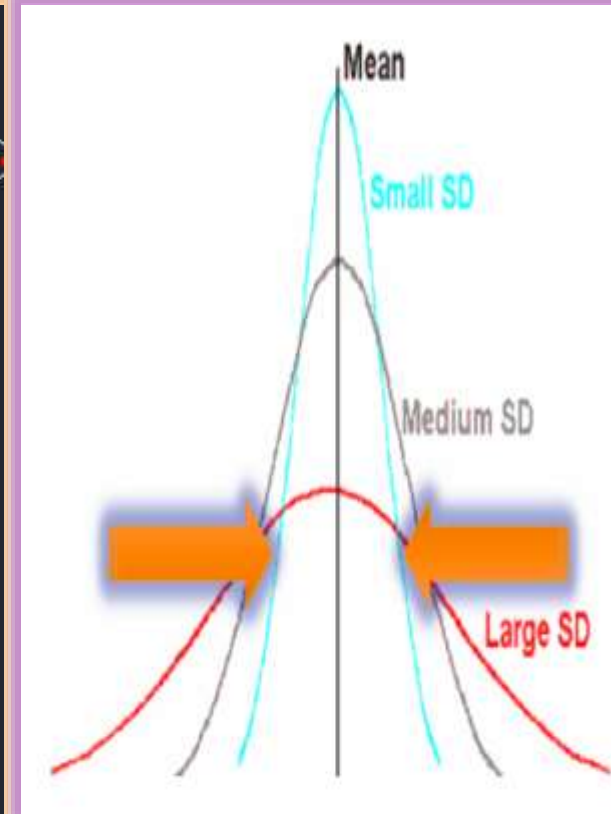
Data-based projects to maximize production opportunity



Optimize cleaning and disinfection



Improve Hygienic Design



'Narrow the bell curve'



Increase productivity

David Clifford
Director Food Safety
Nestle USA, Inc
DAVID.CLIFFORD@us.nestle.com

Thank you



We make Nestlé trusted



Advancements in Sanitation for the Prevention and Control of Food Safety Hazards

Getting to the Root of it all: PEOPLE

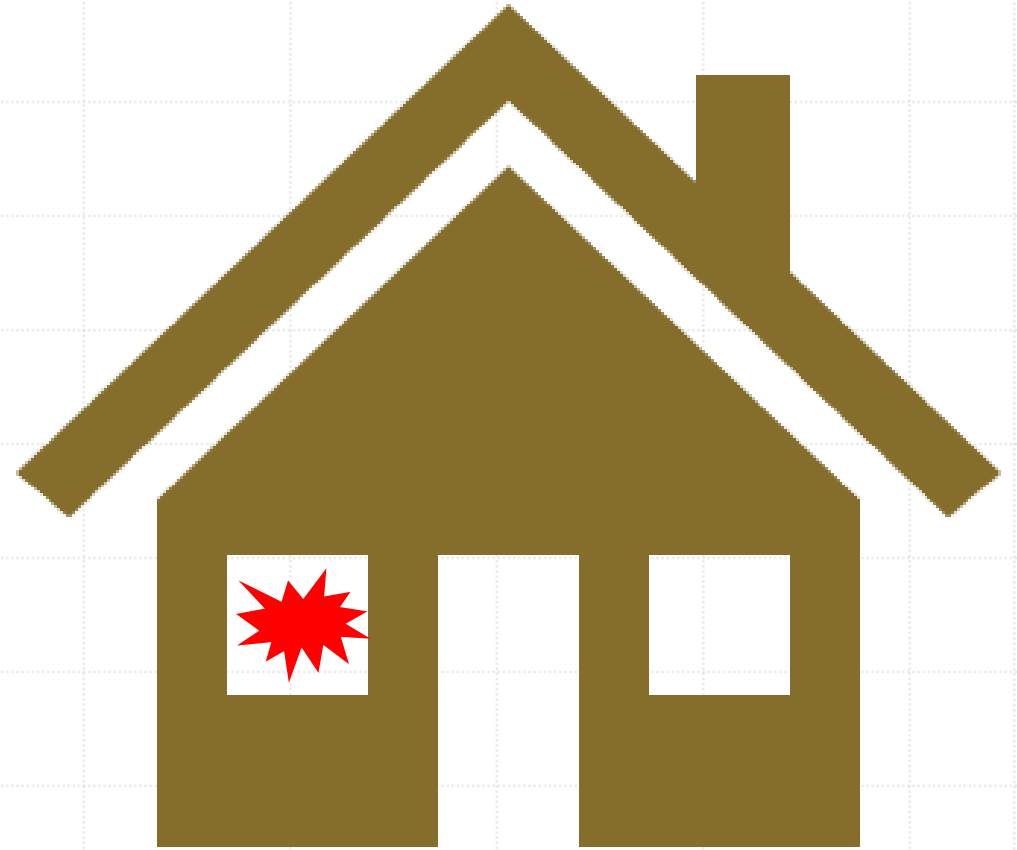
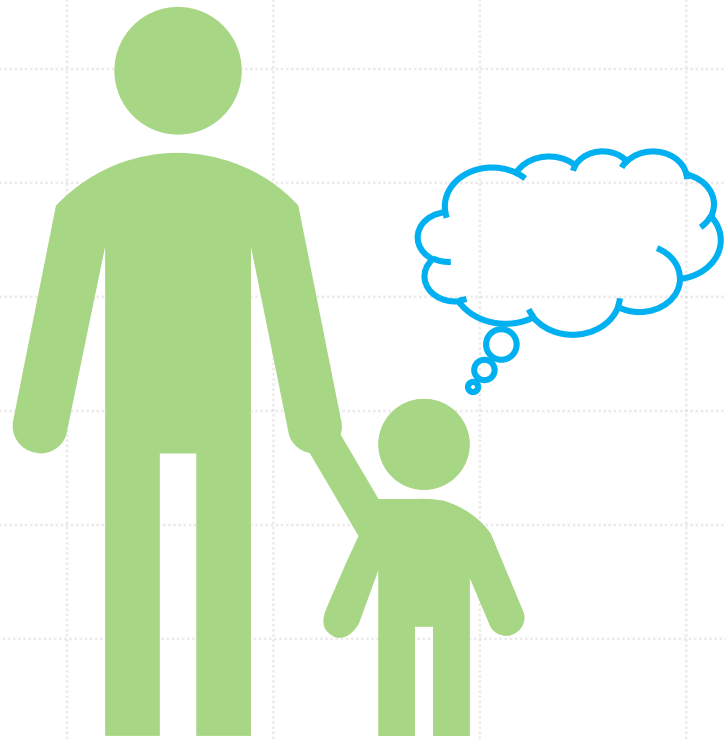
Angela Anandappa Ph.D.



ALLIANCE FOR
ADVANCED SANITATION



CELEBRATING
25 YEARS
Produced by **FoodSafety**
magazine



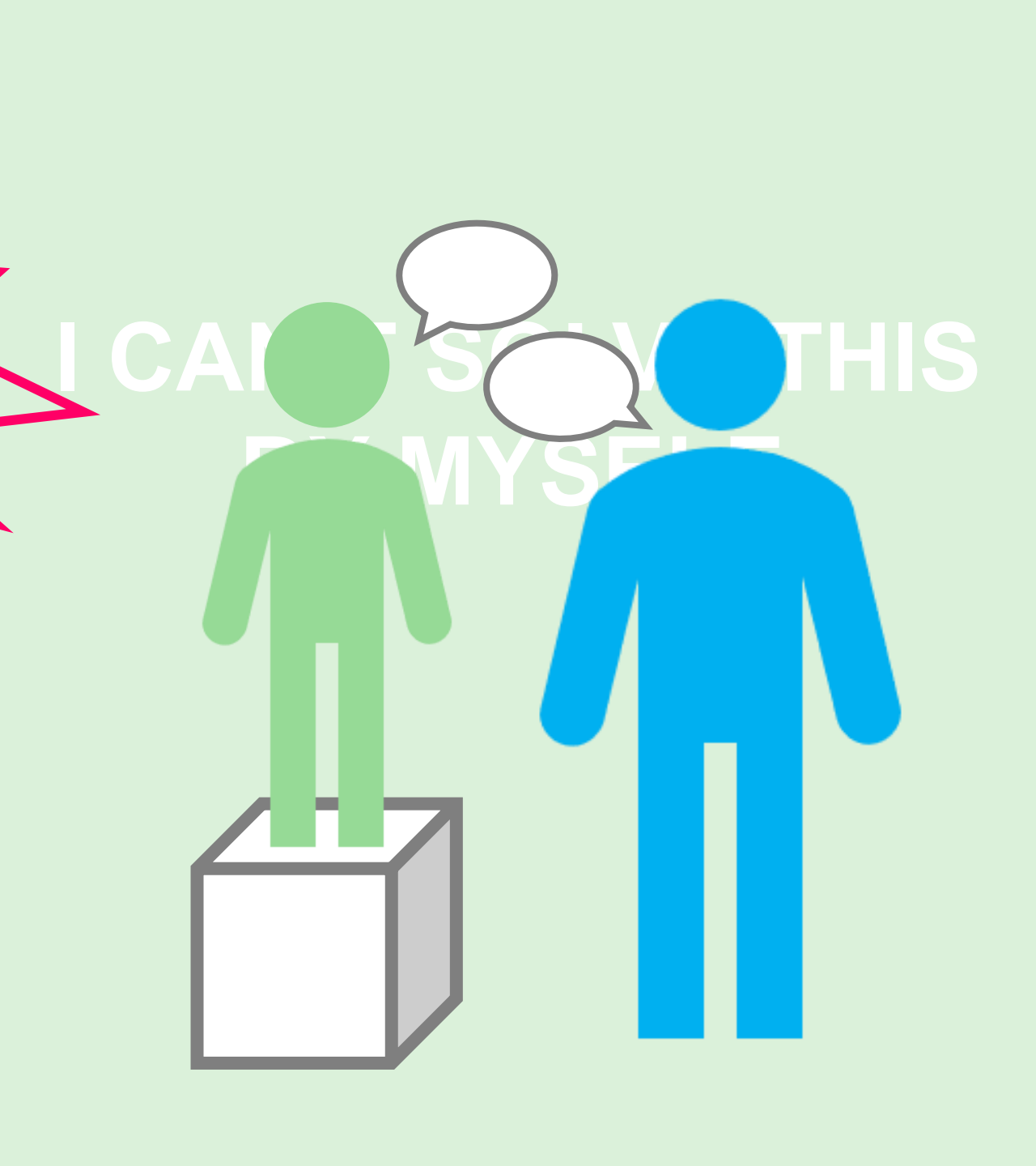
**THEY ARE GOING TO
KILL ME.**

**I CAN'T SOLVE THIS
BY MYSELF.**



I CAN'T TELL THEM.

I MUST TELL THEM.



Food Safety is about **Prevention**



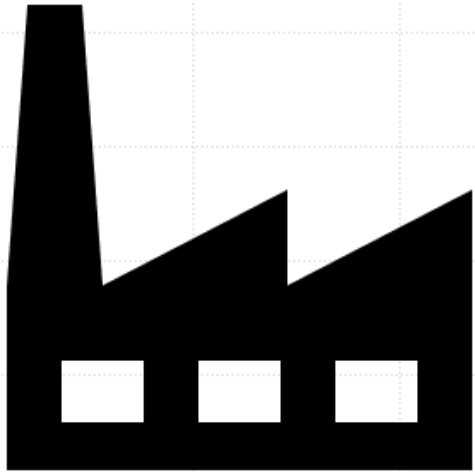
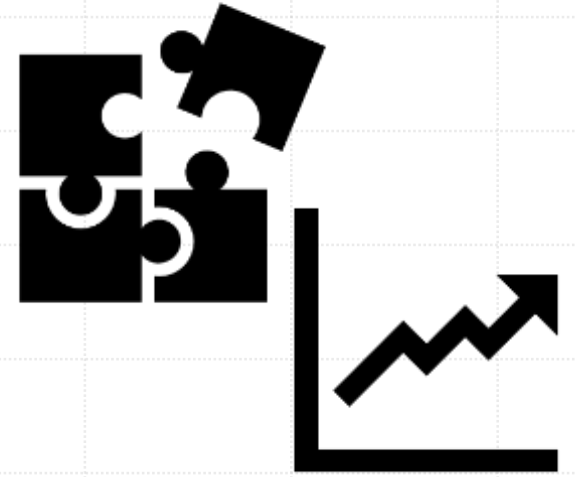
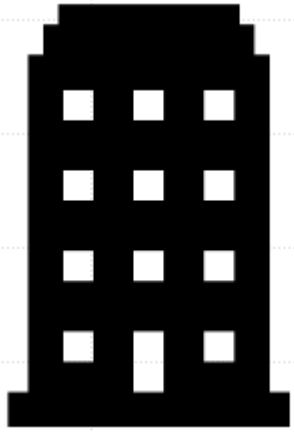
CULTURE

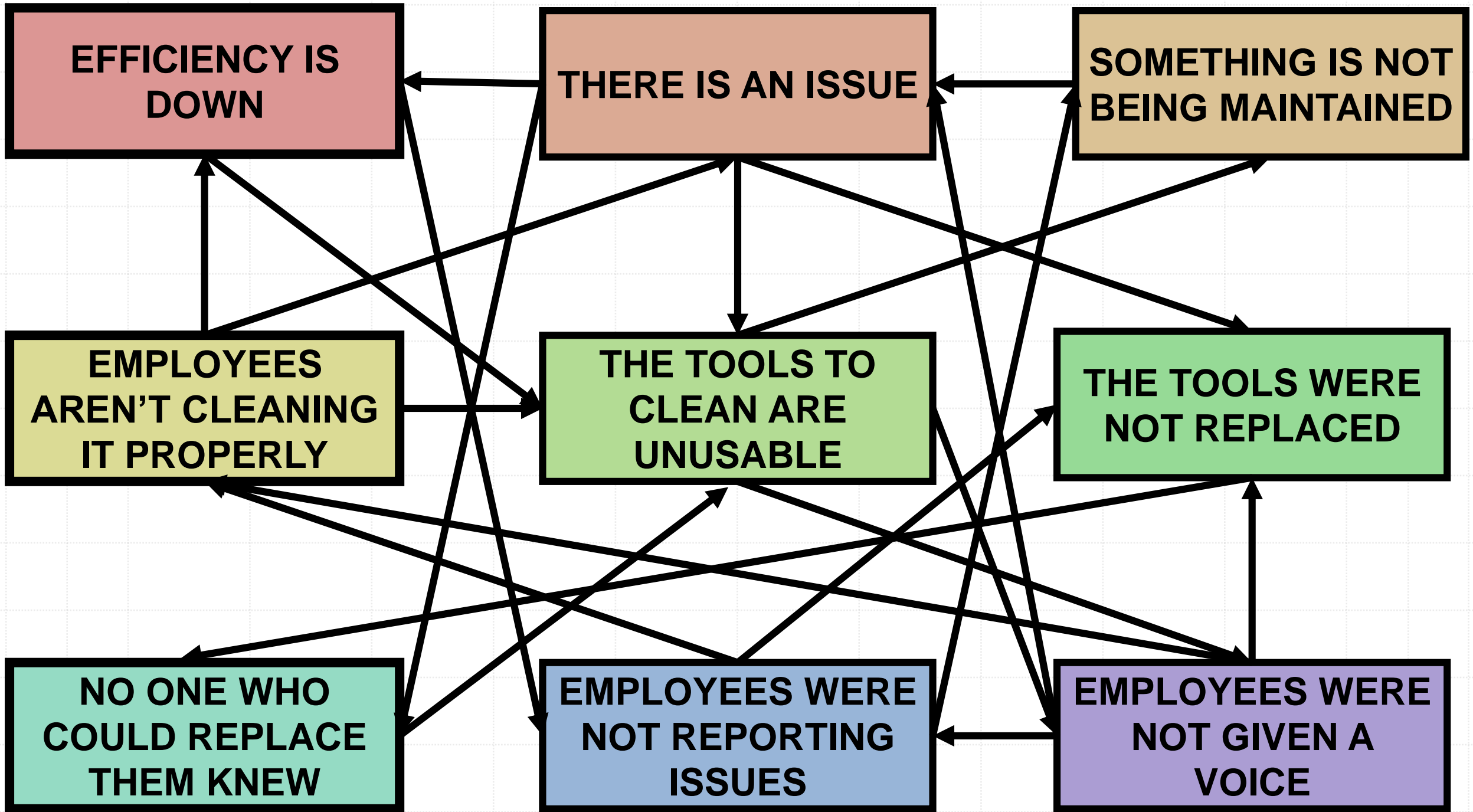
- Being innovative
- Flexibility
- Sights and sounds
- Teams, Zoom, Slack, etc.
- Casual Fridays
- Pool tables and gaming
- Salad bars and all-day coffee
- Networking events
- Going to conferences

FACTORY CULTURE

- Communication
- Sights and sounds
- PPE
- Safety
- Reliability
- Time constraints
- Relationships
- Trust
- Teamwork









POLICY

CERTIFICATIONS

MANAGERS

RULES

LAWS

CULTURE
WORKERS
BEHAVIOR
PRECEDENT

PRACTIC

E

WHAT DRIVES THE ACTION?

Rules:

Laws, Regulations,
Certification, Managers

Behaviors:

- How *we* do things
- What *we* would never do
- Organization's culture

ENABLERS of CULTURAL TRANSFORMATION

A shared mission/value

Measurable and achievable goals

Feeling connected

Recognition, Rewards and incentives

Environment free from obstacles to success



1:

**CHANGE YOUR
LANGUAGE**

2:

**CHANGE YOUR
ACTIONS**

3:

EMPOWER

YOUR

EMPLOYEES

**Do your
employees see
themselves as
your
customer?**



Who do you go to first to solve a problem?

How should ideas be generated?

**How are employees given a stake in their
labor?**

**How can we make sure our people can speak
freely?**

A man in a warehouse setting is sitting on the floor, leaning against a large stack of goods. He is wearing a blue t-shirt, a high-visibility yellow safety vest, grey trousers, and brown leather shoes. He has his hands pressed against his head, suggesting stress or frustration. The background shows blue metal shelving units and stacks of white bags. The text "REMOVE OBSTACLES" is overlaid in white, bold, sans-serif font across the center of the image.

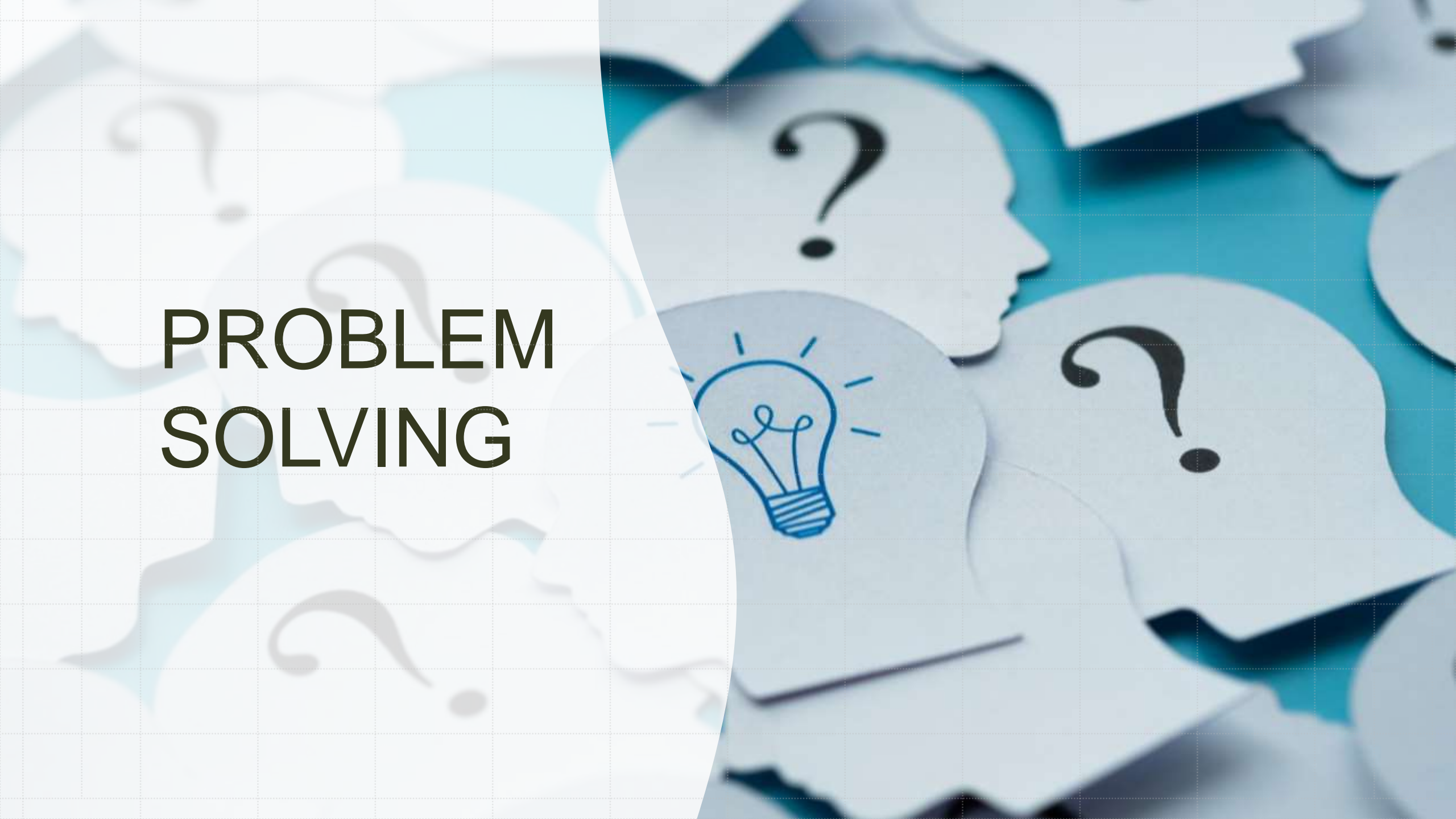
REMOVE OBSTACLES



Psychological Safety

- Encourage bringing up issues proactively
- Follow up and follow through
- Ensure ALL employees can have a voice and are heard
- Combine Ownership & Transparency to foster TRUST in leadership and TRUST between co-workers

PROBLEM SOLVING



The Quality Toolkit CAN be applied here too!

Mar
DOV
S&P
NAS

F
C



Countries

Home

IPEC >

The Prog

What is

Sectors

Child lab

Action against child labour > [1]

products, such as wildberrie
mushrooms, honey, maple s



billionaires in the food system.

department assessed PSSI \$15,138 for each minor-aged employee



PEOPLE

- To help your organizations deliver safer food to the world, you've got to invest in developing people who care about the product.
- People care about things that have meaning to their lives.
- Everyone wants to be seen.

MAKING THE CASE FOR SANITARY DESIGN

Food Safety Summit
Rosemont, IL
May 9, 2023





PRESENTATION OVERVIEW

- Food Manufacturer Obligations
- Evolution to Sanitary Design
- Principles of Equipment Sanitary Design
- Principles of Facility Sanitary Design
- Making the Case for Sanitary Design
 - ✓ Cost of Sanitation
 - ✓ Benefits to Sanitation
 - ✓ Benefits to Operations
 - ✓ Benefits to Maintenance

FOOD MANUFACTURER OBLIGATIONS

Protect Customers

- Prevent illness or injury to consumers
- Prevent losses by our customers

Protect Company

- Prevent harm to company, brand names
- Assure continuity for employees, stakeholders
- Prevent legal liability

Regulatory

- Conform to regulatory requirements
- Prevent regulatory control action, scrutiny

EVOLUTION TO SANITARY DESIGN

- **Stainless steel introduced in 1908**
- Buildings built or purchased for productivity
- Equipment designed for throughput
- **Belief was that with time and chemicals the facility could be cleaned**
- Significant foodborne illness outbreaks in 1980's and 1990's...
- Implementation of regulations to promote food safety systems
- **American Meat Institute (AMI) multidisciplinary task force formed, developed 11 Principles of Sanitary Design for Facilities, 10 Principles of Sanitary Design for Equipment**



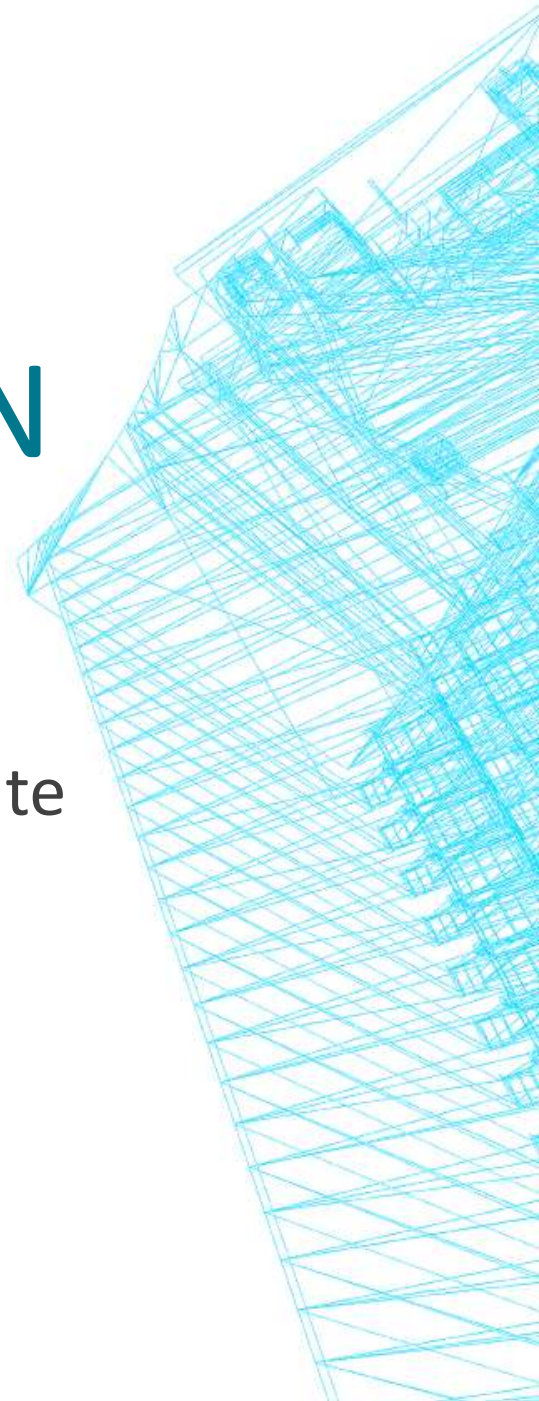
SANITARY DESIGN DEFINED

- Defined: the application of engineering techniques which allow the timely and effective cleaning of the entire manufacturing asset
- Intent: to prevent significant food hazards:
 - ✓ **Food pathogens:** *Listeria monocytogenes*
 - ✓ **Food spoilage:** lactic acid bacteria, mold
 - ✓ **Food allergens:** wheat, egg, soy, milk, peanuts, tree nuts, fish, crustacean shellfish and sesame



SANITARY EQUIPMENT DESIGN

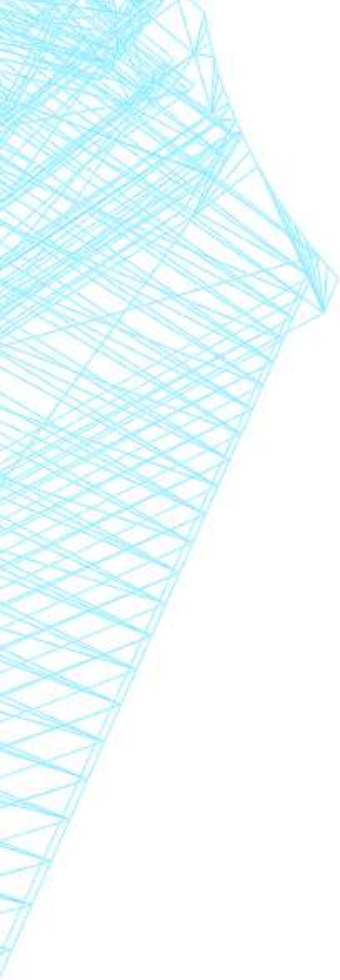
10 Principles from the North American Meat Institute
(NAMI)





EQUIPMENT SANITARY DESIGN PRINCIPLES

1. Cleanable to a microbiological level
2. Made of compatible materials
3. Accessible for inspection, maintenance, cleaning and sanitation
4. No product or liquid collection
6. Hollow areas should be hermetically sealed. No niches; free from tack welds
7. Sanitary operational performance
8. Hygienic design of maintenance enclosures
9. Hygienic compatibility with other plant systems
10. Validate cleaning and sanitizing protocols



VALIDATION VS VERIFICATION

Validation

- Will the process we have defined prevent or significantly reduce a food safety hazard?
 - ✓ Provides scientific documentation that the process is effective
 - ✓ Documentation may be testing, peer reviewed papers or regulatory documentation

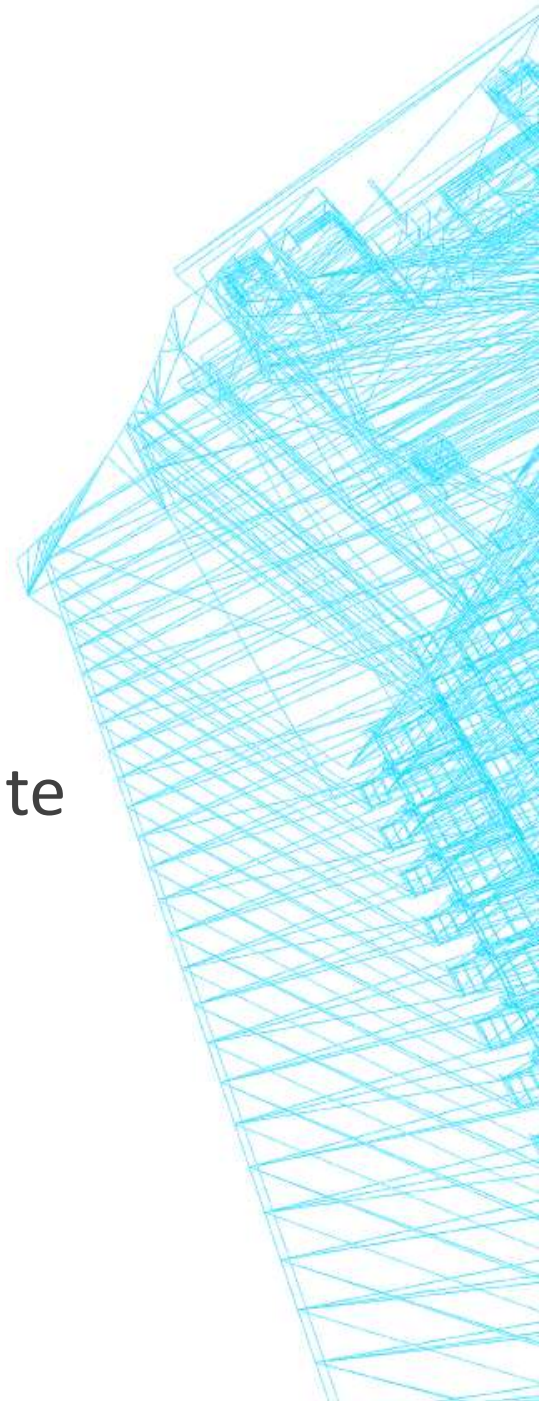
Verification

- Are we following the validated process?
 - ✓ Verification is a planned series of monitoring and testing
 - ✓ Monitoring the sanitation process against procedures is verification
 - ✓ Pre-op is further monitoring to verify sanitation is effective

Microbiological swabs for environmental organisms or spoilage organisms
ELISA swabs for food allergens, where they are available

SANITARY FACILITY DESIGN

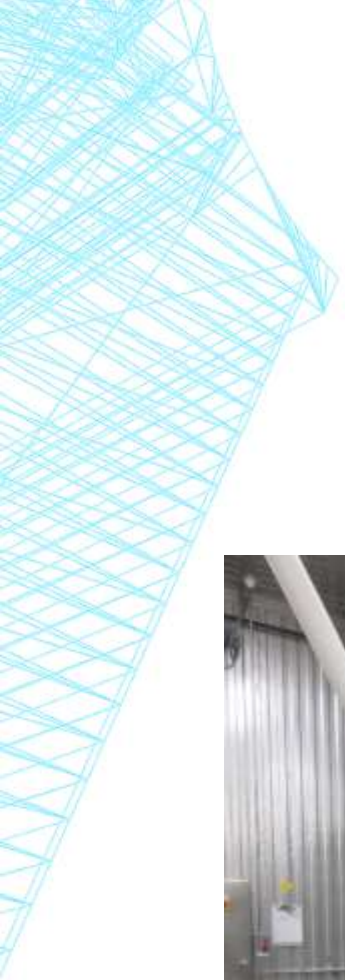
11 Principles from the North American Meat Institute
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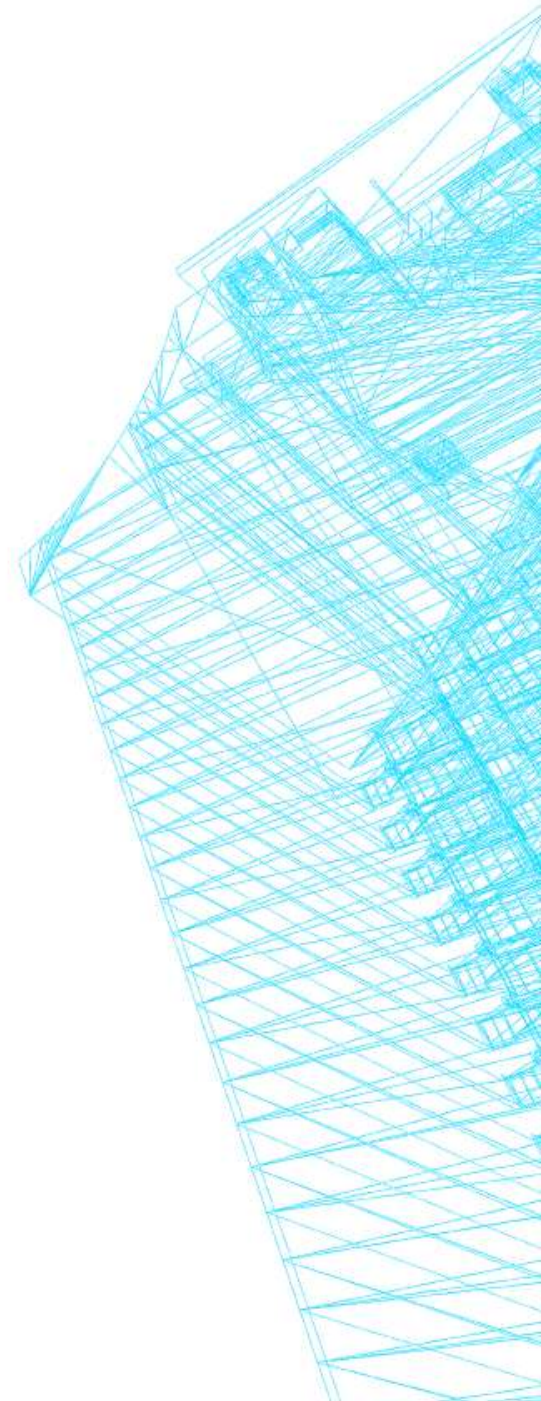
FACILITY SANITARY DESIGN PRINCIPLES

1. Distinct Hygienic Zones Established in the Facility
2. Personnel and Material Flows Controlled to Reduce Hazards
3. Water Accumulation Controlled in the Facility
4. Room Temperature and Humidity Controlled
5. Room Airflow and Room Air Quality Controlled
6. Site Elements Facilitate Sanitary Conditions
7. Building Envelope Facilitates Sanitary Conditions
8. Interior Spatial Design Promotes Sanitation
9. Building Components and Construction Facilitate Sanitary Conditions
10. Utility Systems Designed to Prevent Contamination
11. Sanitation Integrated into Facility Design



MAKING THE CASE FOR SANITARY DESIGN

How do we sell sanitary design to those involved in financial decisions?



SANITATION COST PER DOLLAR

- Labor = 46.5%
- Water/Sewage = 19%
- Energy = 8.0%
- Cleaning compounds = 6.0%
- Corrosion damage = 1.5%
- Miscellaneous = 19.0%
 - ✓ PPE, cleaning and sanitizing tools and equipment

- Labor is the largest cost per sanitation dollar spent
 - ✓ Our employees are a valuable resource
- Water is not only a significant part of the expense,
 - ✓ it's a valuable resource that can become limited
 - ✓ Just ask people in the food industry in CA and TX!

SELLING SANITARY DESIGN

What gets more serious attention?

This

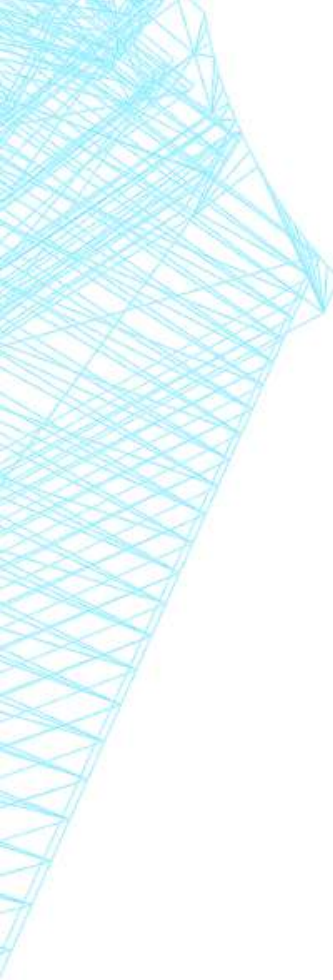


This



OR

SELLING SANITARY DESIGN

- 
- Understand the sanitation cost per dollar
 - Conduct a sanitary design audit
 - ✓ Identify opportunities for improvement
 - ✓ Prioritize the corrections needed (high, medium, low; near term, long term; A, B, C etc.)
 - Work with supplier, FAT; personnel safety, maintenance, cleaning/sanitizing
- Show the benefits
 - ✓ Prevent food safety hazards
 - ✓ Sanitation efficacy/efficiency
 - ✓ More productivity, fewer late starts
 - ✓ Less Than Daily cleaning
 - ✓ Resource utilization for Master Sanitation
 - ✓ Reduce regulatory findings
 - ✓ Maintenance efficiency
 - ✓ Consistent product shelf life

IMPLEMENTATION OF SANITARY DESIGN

- Meet our obligation to customers and consumers +
- Meet our obligation to protect the company good name and our valued brands +
- Meet our obligation to our stakeholders +
- Meet our obligation to regulatory conformance and prevent regulatory control action +
- Continuous improvement for sanitation, operations and maintenance efficiency

Discussion & Questions



Connect with me on [LinkedIn](#), email me at akacramerscorner@gmail.com
You can find more information on Sanitary Design with the purchase of “**Food Plant Sanitation: Design, Maintenance and Good Manufacturing Practices**”, available at crcpress.com or taylorfrancis.com

