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Ugur Tuncer
Mettler Toledo Turkiye

8.Uluslararası Gıda Güvenliği Kongresi

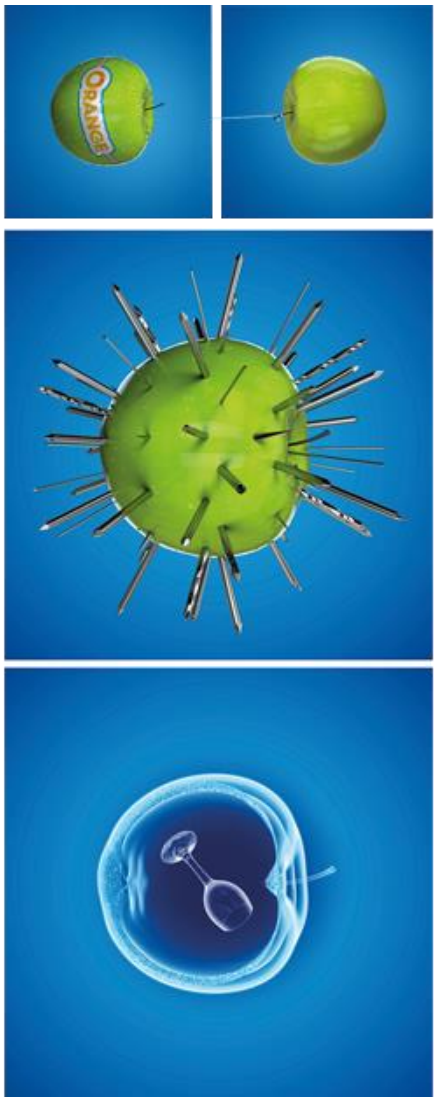
6 Steps to Preventing Physical Contamination

METTLER TOLEDO

Agenda

Contamination

- Microbiological
- Chemical and radiological
- Physical contaminants
- Allergens
- Fraud



The Perils of Physical Contamination

Recalls can be necessary for many reasons!

- Foreign body contamination
- Missing allergen declarations
- Not as advertised
- Bacterial contamination
- Incorrect weight
- Mislabelling
- Chemical contamination
- Incorrect branding

The BRCGS recently published a paper covering the potential impact of product recalls in the food and feed sector, highlighting and exploring the three most common causes: Allergens, Foreign Bodies and Pathogenic Organisms.

https://www.brcgs.com/media/2167992/ptplusfoodplusanalysispluswhitepaperplus-pluspreventionplusbetterplusthanpluscure.pdf

Agenda

1. Introduction
2. The Perils of Physical Contamination
3. Different Types of Physical Contamination
4. The Importance of Zero Contamination
5. Six Steps to Preventing Physical Contamination
6. Further Information

The Perils of Physical Contamination

Recalls Impact The Entire Industry

Brands/Manufacturers	Consumers	Industry
BUSINESS	**CONFIDENCE**	**REPUTATION**
• Exposes Safety Issues • Product Recalls • Fines • Lost Business • Criminal & Civil Prosecutions • Product Wastage Costs • Brand Reputational Damage	• Health Consequences • Fatalities • Reduced Trust • Replaced Brand Loyalty	• Product Recalls/Audits • Supply Chain Scrutiny • Food Safety Regulation Reviews • Political Implications

The Perils: State of the Market Place

Food Recalls Are On The Rise

- Recall of unsafe food products in UK have jumped by 40%, driven by rising concerns with poorly labelled items[1]
- USDA Summary of Recall Cases in Calendar Year 2019: 124 recalls. 34 for extraneous material, 36 by undeclared substances/ allergens and 3 by processing defect[2]
- In the US, the average cost of recalling food for a company is **$10 million**[3]
- Recalls often trigger a **chain reaction effect** throughout the entire supply chain

[1] Food recalls on the rise (foodmanufacture.co.uk)
[2] Summary of Recall Cases in Calendar Year 2019 | Food Safety and Inspection Service (usda.gov)
[3] Joint industry study by the Food Marketing Institute and the Grocery Manufacturers' Association

Agenda

Different Types of Physical Contamination

Incidents Are Varied

- Most common cause of recalls is **undeclared allergens** contamination
- **Foreign matter is the 2nd most common cause** of food contamination
- Detectable physical contaminants include **metals, glass, dense plastics, calcified bones and stones**

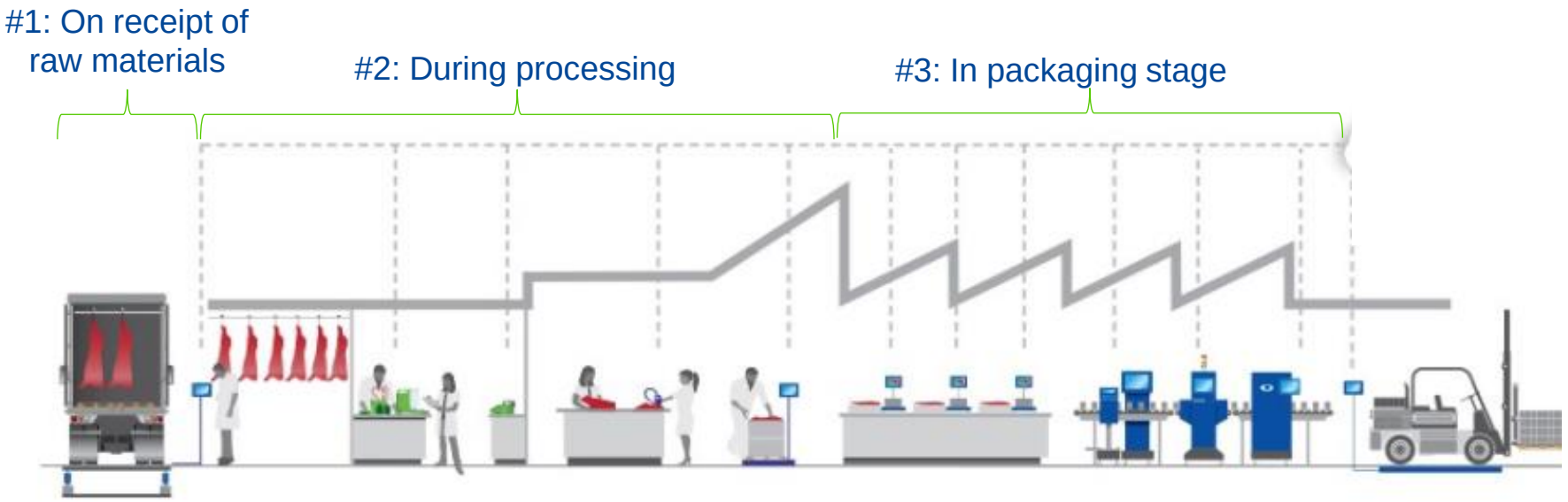
https://www.tracegains.com/blog/sqf-in-2016-a-recap-of-recall-stats-and-how-to-move-forward-in-2017#:~:text=The%20U.S.%20Food%20and%20Drug,the%20USDA%20FSIS%20issued%20125
https:// www.fsis.usda.gov/food-safety/recalls-public-health-alerts/annual-recall-summaries/summary-recall-cases-calendar-0

Different Types of Physical Contamination

Incidents Are Varied

- Food contamination incidents are **extremely varied** and **occur at various points** during the **food supply chain**
- Physical contamination can enter the **production process** at **numerous stages**

Example: Meat Processing Line



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The Importance of Zero Contamination

More Than Food Safety

- Foreign body contamination can pose a **direct risk to health**
- However, even if the foreign body is not deemed harmful, e.g. small scraps of paper, the **consumer expects to receive the product in perfect condition**

- **Why?**
  - Exposes a **breakdown in quality assurance** processes during manufacturing
  - Creates **mistrust in the brand**

Agenda

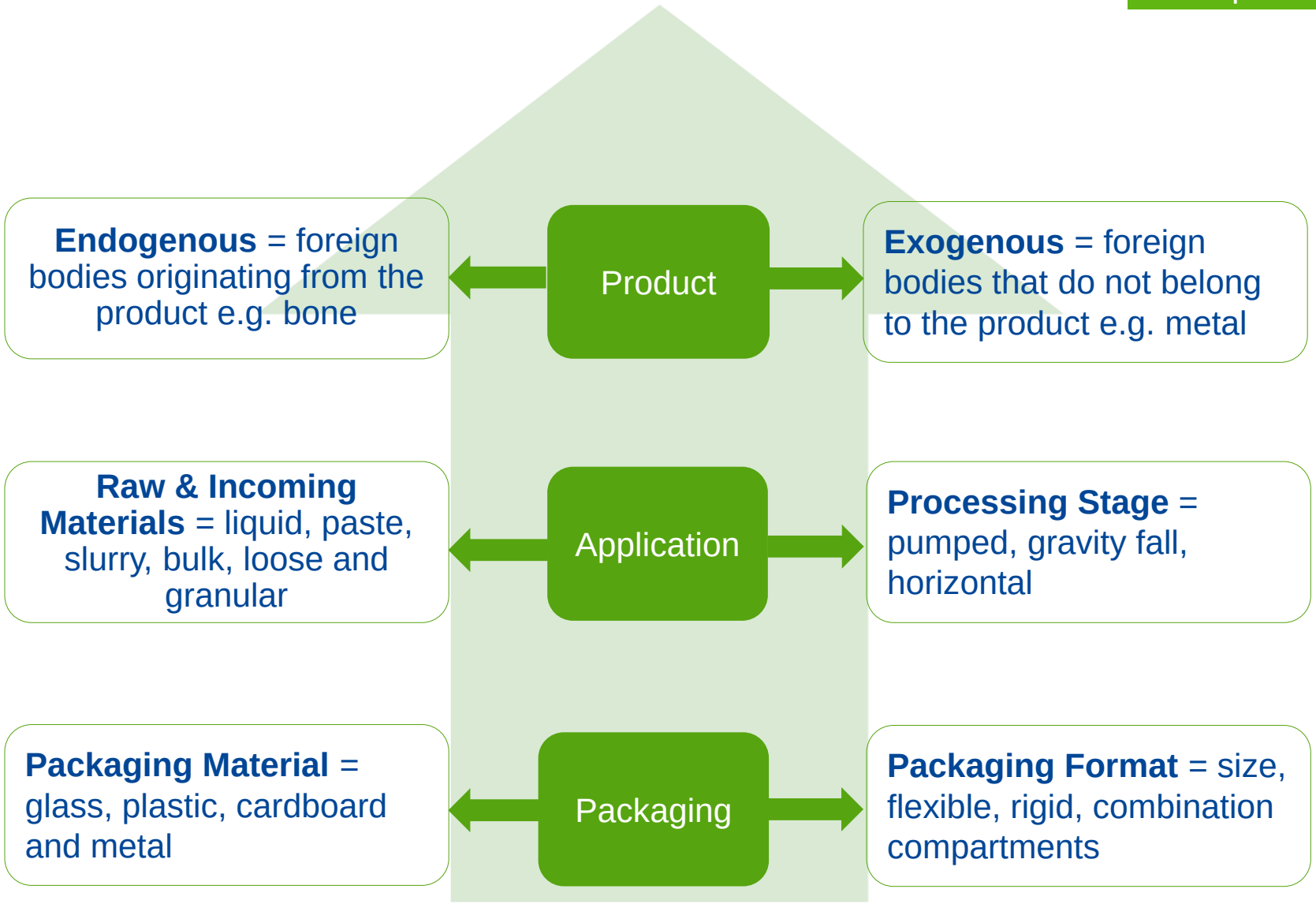
6 Steps to Preventing Physical Contamination

1	**Understand How Contamination Occurs**
2	
3	
4	
5	
6	

Understand How Contamination Occurs

Three Main Considerations to Identify Foreign Body Types

Step 1



6 Steps to Preventing Physical Contamination

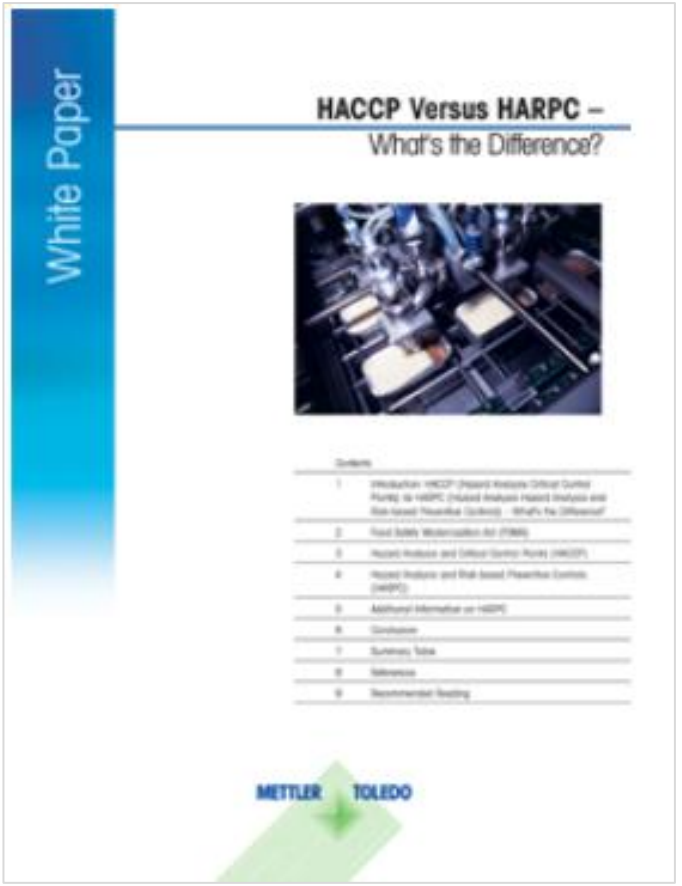
1	**Understand How Contamination Occurs**
2	**Identify Areas of Weakness On Your Line**
3	
4	
5	
6	

Identify Areas of Weakness On Your Line

Mitigate Your Risks

Step 2

- Complete a **Hazard Analysis and Critical Control Point** (HACCP) or **Hazard Analysis and Risk-based Preventive Controls** (HARPC) audit
- Critical Control Points (CCPs) are established at certain points after risks have been identified. The CCP is designed to mitigate the identified risk.
- **HACCP** identifies the risk of contamination
- **HARPC** also includes additional planning for intentional adulteration, food fraud and terrorist acts



HARPC Versus HACCP - What is the Difference? (mt.com)

6 Steps to Preventing Physical Contamination

1	**Understand How Contamination Occurs**
2	**Identify Areas of Weakness on Your Line**
3	**Have a Strong Line of Defense**
4	
5	
6	

Have a Strong Line of Defense

Protect Valuable Product

Step 3

- For full quality control, product inspection technologies could be integrated at more than one point

- **Early Detection**
  - Liquid, paste and slurry format are more homogenous and easier to inspect
  - Contaminants tend to be larger and easier to detect
  - Removal of foreign bodies will protect downstream processing equipment from damage
  - Eliminates contaminants before additional production value is added
  - Minimizes wastage and associated costs

Have a Strong Line of Defense

Protect Valuable Product

Step 3

- **Mid-way during Processing**
  - Identifies processing problems e.g. metal filings from broken sieves
  - Reduces wastage
  - Protects the application before additional value and time are added

Have a Strong Line of Defense

Protect Valuable Product

Step 3

- **End of Production**
  - Inspects for contaminants due to a breakdown in the packaging process e.g. glass splinters in the capping process
  - Last line of defense before products leave the manufacturing facility

6 Steps to Preventing Physical Contamination

1	Understand How Contamination Occurs
2	Identify Areas of Weakness on Your Line
3	Have a Strong Line of Defense
4	Select the Appropriate Technology
5	
6	

Select the Appropriate Technology

Two Mainstream Contaminant Detection Technologies

Step 4

Metal Detection

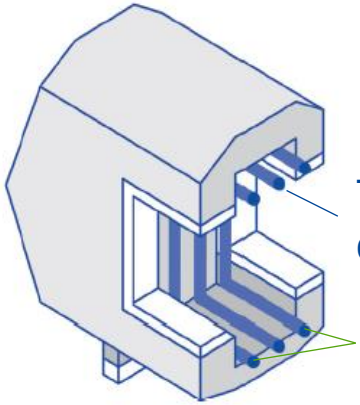
X-ray Inspection

Select the Appropriate Technology

Two Mainstream Contaminant Detection Technologies

Step 4

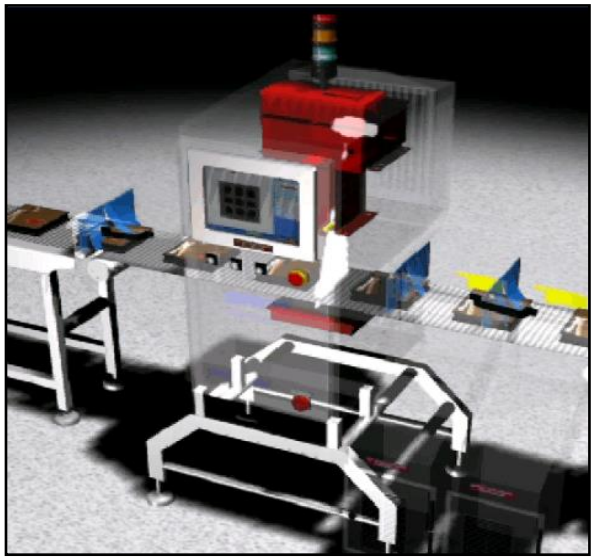
- **Metal detectors** identify all **metals** including ferrous (chrome, steel etc.), non-ferrous (brass, aluminium etc.), magnetic and non-magnetic stainless steels including those packaged in metalized film



Two Mainstream Contaminant Detection Technologies

Step 4

- **X-ray** inspection technology detects **metal and non-metal** foreign bodies including glass, mineral stone, calcified bone, high-density plastics and rubber compounds



MD, XR or Both? Simplifying The Choice

Metal detection and x-ray inspection offer differing capabilities

Metal detection may be the best choice when:

- Metal is the only likely foreign body contaminant risk
- Aluminum has been identified as a potential risk
- Product must be inspected under gravity-fed conditions, including VFFS applications
- There is a need to protect expensive downstream equipment from metal contaminants

X-ray inspection may be the best choice when:

- Non-metallic contaminants such as glass, mineral stone, calcified bone, or high density rubber or plastics are identified as the contaminant risks
- Product is in metal packaging
- Additional product and packaging checks are required, such as mass measurement, checking for missing or broken products, product in seal inspection or fill level checks

When Both Solutions Should Be Considered

- Different foreign body risks are identified at different CCPs
- Retailer contracts require both
- To achieve peace of mind that all precautionary steps have been taken to minimize the risk of foreign body contamination

Note

Product testing prior to purchase is highly recommended to establish achievable sensitivity.

6 Steps to Preventing Physical Contamination

1	Understand How Contamination Occurs
2	Identify Areas of Weakness on Your Line
3	Have a Strong Line of Defense
4	Select the Appropriate Technology
5	Future Proofing
6	

Future Proofing

Step 5

Consider Your Application, Product & Facility

Considerations	Benefits
Current and future products, packaging types and formats	**Reduce total cost of ownership**
Spacing Requirements: system length, number/width production lanes, spacing between products, total footprint	**Accommodate facility restrictions**
Security: system, IT, reject bin	**Protect your product and business**
Monitoring and reporting needs	**Prove due diligence**
Power options	**Lower operating costs**
Product and packaging integrity checks	**Uphold brand reputation**
Set up capabilities and your in-house expertise	**Reduce installation time and costs**

6 Steps to Preventing Physical Contamination

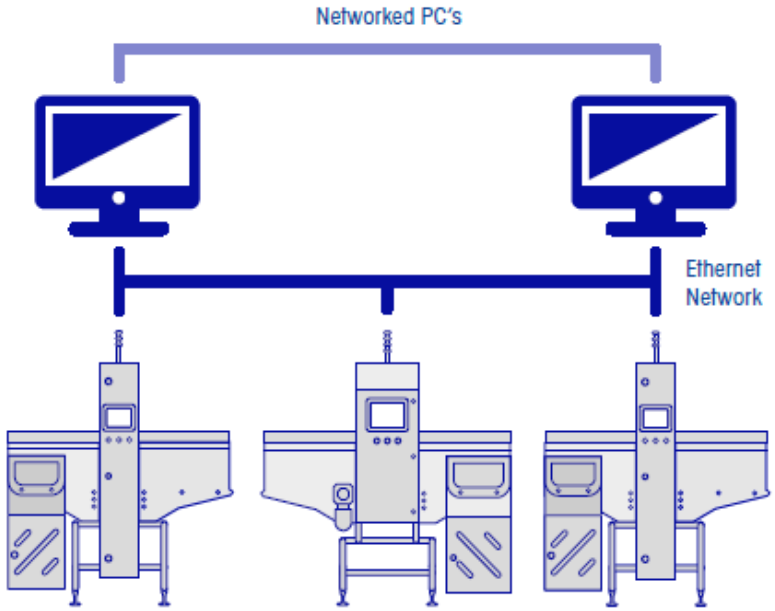
1	Understand How Contamination Occurs
2	Identify Areas of Weakness on Your Line
3	Have a Strong Line of Defense
4	Select the Appropriate Technology
5	Future Proofing
6	Consider Digitalization

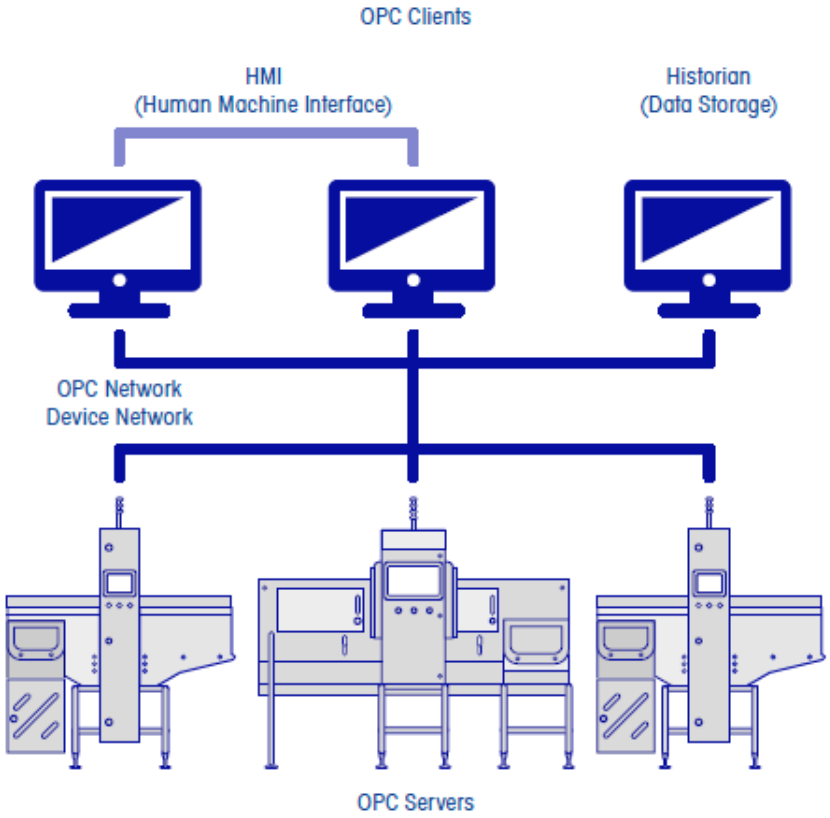
Consider Digitalization

Improving Food Traceability

Step 6

- Improving **production line efficiencies** and **management control**
- **Streamlining** processes for quality control standardization
- **Transparent traceability**
- **Serialization**





Ensuring Food Safety Through the Prevention of Food Contamination

1	Understand How Contamination Occurs
2	Identify Areas of Weakness on Your Line
3	Have a Strong Line of Defense
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Further Information: Trends

Don’t Be Left Behind

- **Some Key Trends:**
  - Increased Detection Sensitivity
  - Automation
  - Digitalization
  - Sustainability - Reducing Food Waste
  - Transparency
  - Changing Customer Behaviours

‘’Food Safety is Our Responsibility’’

Thank you for your time