The Critical Role of Hygienic Engineering in Today's Food Production

Moderator: Jason White, Fortrex Solutions, Chair of Sanitary Equipment and Facility Design PDG

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Today's Speakers

- Patrick Wouters, EHEDG
- Dan Erickson, Harold Wainess & Assoc, 3-A

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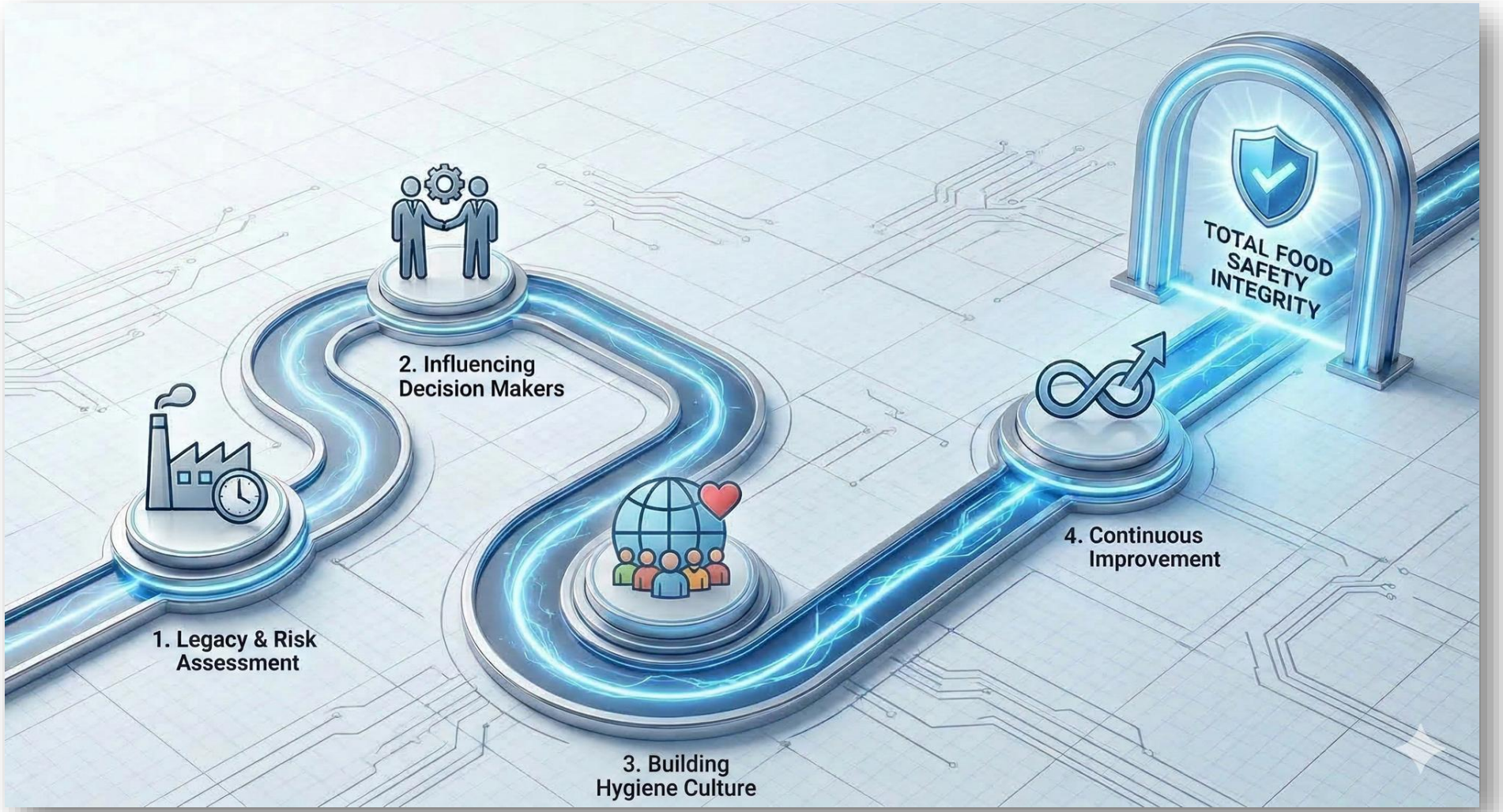
Five Sessions - One Goal: Food Safety Integrity



The Critical Role of Hygienic Engineering in Today's Food Production

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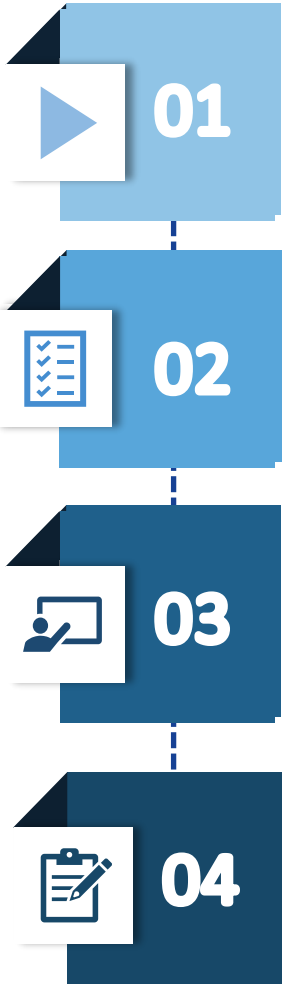
What is Hygienic design

IAFP Webinar – April, 30 2026

Patrick Wouters PhD

Development Director, EHEDG

Agenda



Introduction

Context: What are we managing by Hygienic Design

Hygienic Design Principles Explained

Summary

Presenter

Patrick Wouters

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Patrick Wouters is Development Director at EHEDG, where he focuses on embedding hygienic design into global food safety management strategies. He chairs the Subcom Working Groups, leads the EHEDG Hygienic Design Benchmarking Project, and contributes as an authorized trainer and principal author of key guidelines. His career spans food and beverage production, R&D, hygienic engineering, and quality management, including global responsibility roles at Cargill and Unilever, as well as experience in the Dutch dairy sector. He holds a PhD in food preservation technologies from the Technical University of Berlin.

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Strategic Approach of Hygienic Design

Here's what we are ultimately trying to achieve:

Product Safety and Consumer Protection

Compliance and Risk Reduction

Cleanability and Efficiency

Operational Sustainability

Prevention of Cross-Contamination

Economic Benefits

Why Are We Here?

Common product safety sources

- Pathogens
- Physical
- Chemical
- Allergens

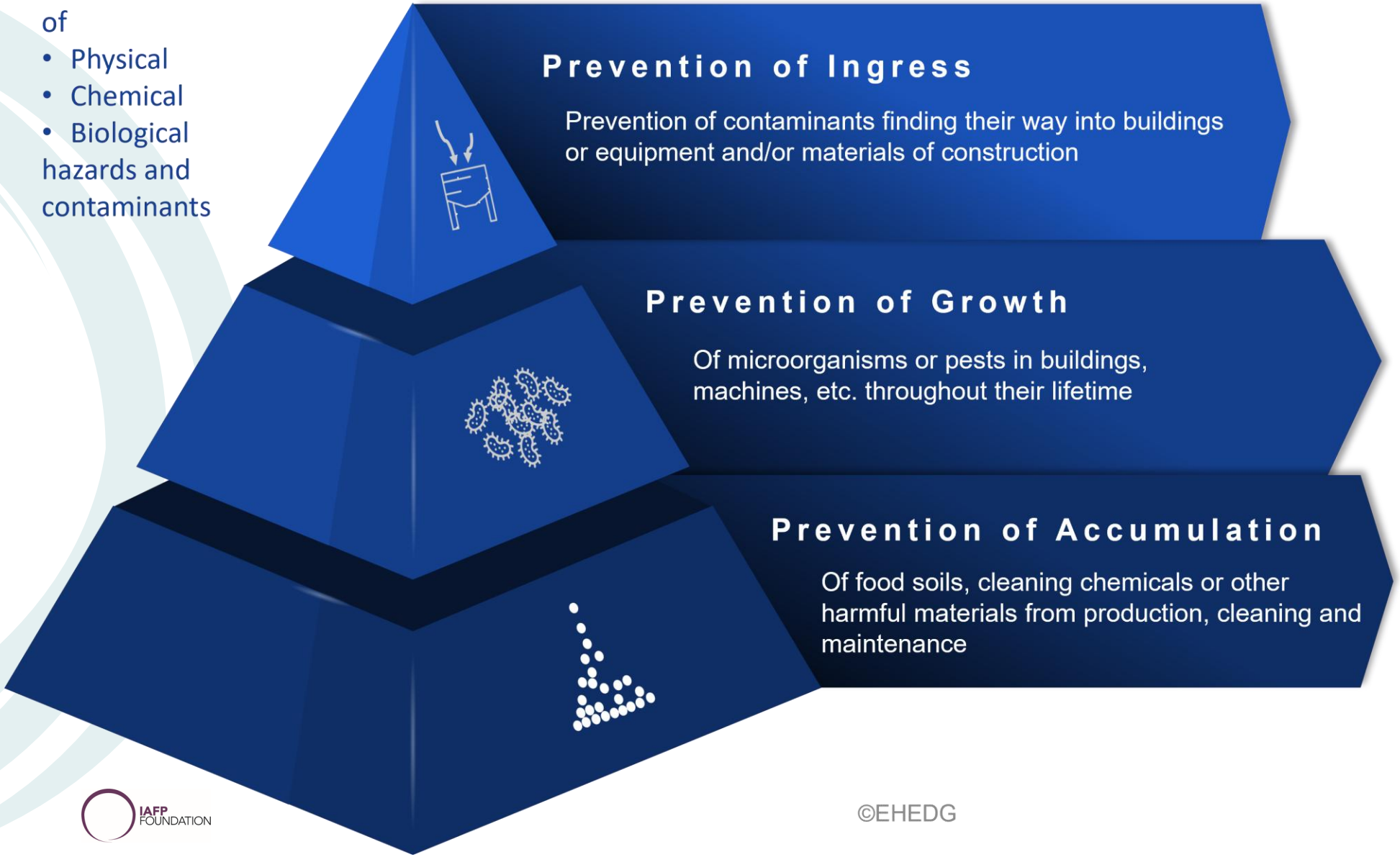
Common product quality defects (e.g. by cross-contamination)

- Odour
- Taste
- Colour
- Microbiological Spoilage
- Lumps - particles

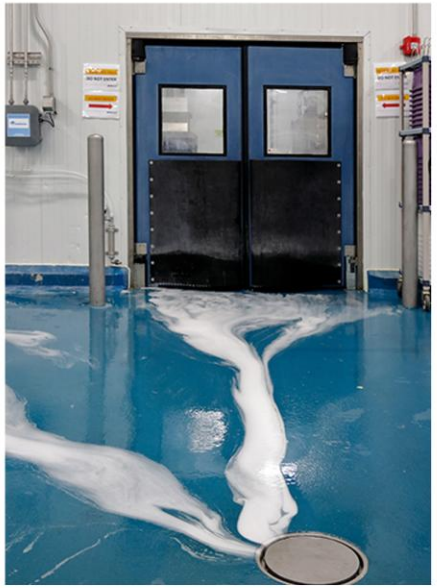
Hygienic Design Objectives - refresher

of
- Physical
- Chemical
- Biological

hazards and contaminants



Application Areas of Hygienic Design



Cleaning & Sanitation

Building Design

Equipment Design

Utility Design

EIA

Personal, Gowning & Access Design

Hygienic Design – Factory

Site Design	
Access control	Foliage
Drainage	Fences
Lighting	Roadways

Building Envelope	
Docking station	Loading station
External doors	Roof
External walls	Roof drains
External windows	Drainage

Building Construction
Superstructures

Plant Lay-out	
Air flow	Control room
Material flow	Cleaning station
People flow	Corridor
Waste flow	Maintenance workshop
Personnel facilities	Chemical storage
Transition zone	Storage areas
Laboratories	Waste storage

Architecture Finishing	
Stairs	Wall penetration
Ceilings	Drains
Elevators	Internal doors
Internal floors	Internal walls
Internal windows	Junctions & Joints
Platforms & Supports	

Hygienic Design - Equipment

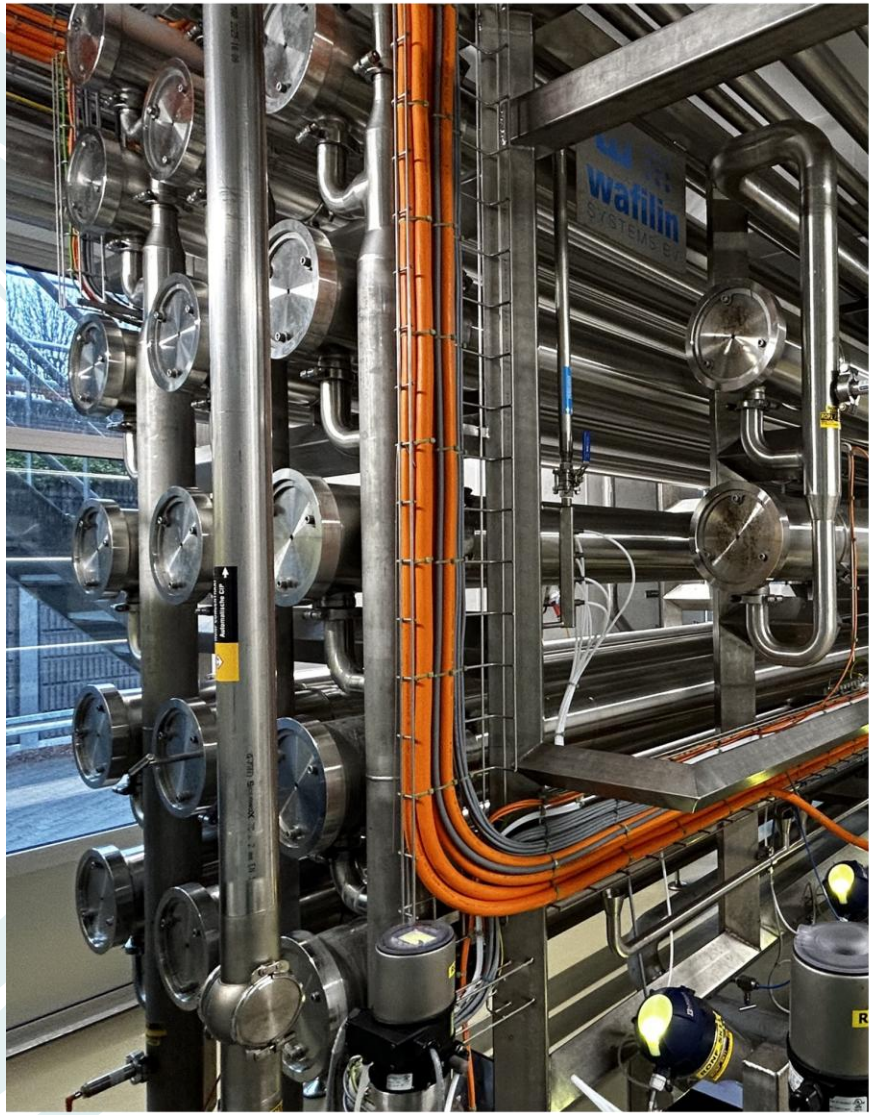
Design Principles	
Open equipment	Hygienic welding
Closed equipment	Lubricants
Hygienic design criteria	Tank and vessel cleaning
Chemical treatment stainless steel	Mechanical, elastomeric seals
Continuous UHT sterilization of liquid food	Continuous pasteurization of liquid food

Hygienic Design Integration
Integration principles
Hygienic design risk management

Equipment	
Pumps	Transfer systems
Rotary valves	Sieve and filters
Pipe couplings	Diverter valves
Belt conveyors	Sensors
Discharging systems	CIP installations
Hopper and silo design	(Sampling) valves for liquids
Aseptic and Hygienic Filling Machines	Design packaging systems for solid food
Disc stacks centrifuges	Spray dryer and fluid bed

Testing Methods
Cleanability – Closed equipment
Cleanability – Open equipment
Hygienic weld joint

Hygienic Design – Utilities/EIA



Air & other Gasses	
Compressed	Over Pressure
HVAC	Humidity
Filters	Particles
Oil content	

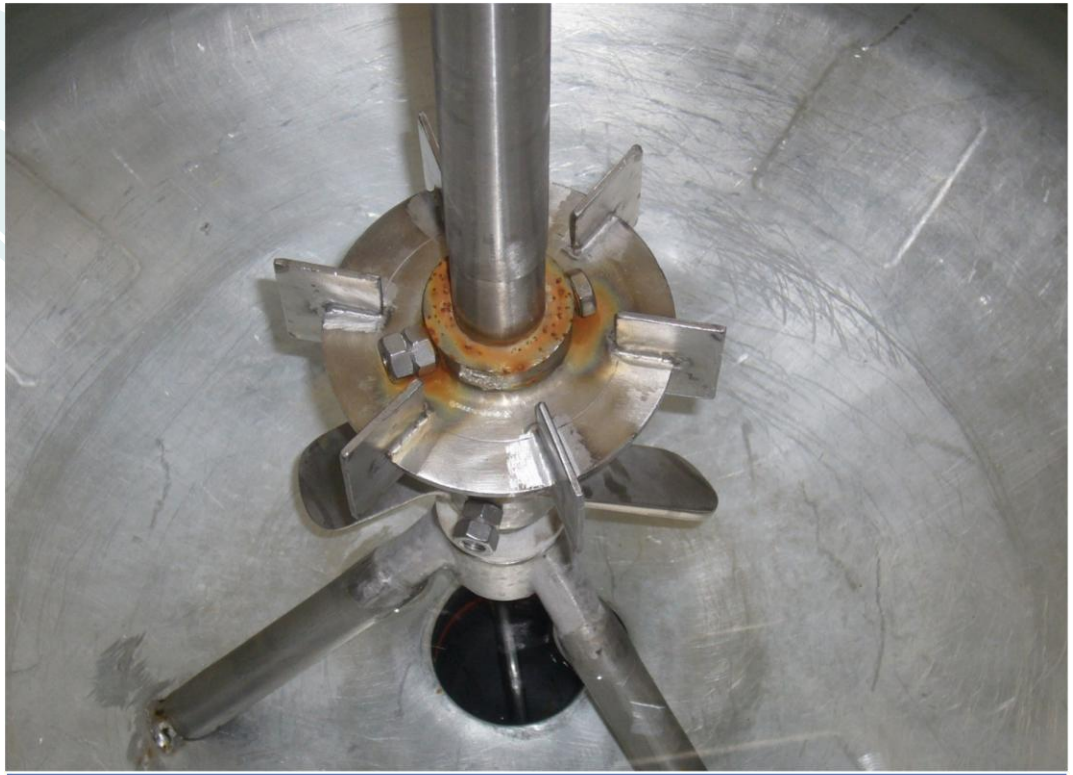
Water & Ice	
Source	Potable water
Storage	Cooling water
Distribution	Re-use
Treatment	Additives

Integration	
Back-flow prevention	Insulation

Steam	
Culinary – food contact steam	Additives
Condensate management	Steam traps

Electric / Instrumentation / Automation	
Cabling Systems and routing	Location of Cables
Cabinet	Ducts
Cable trays, Conduits	Cable glands and entries
Mounting	Human-machine interfaces
IP-rating	Sensors
Actuators	

Hygienic Design Risk Management

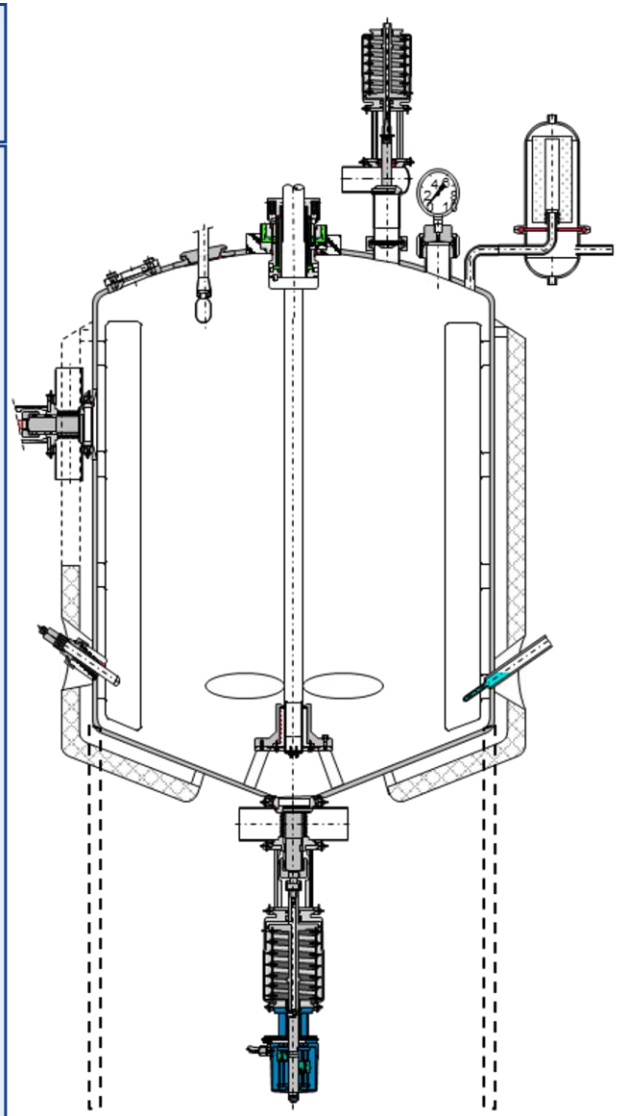


Legacy

Assessment of fitness for purpose of existing food manufacturing buildings or equipment

New

Specification and design of new equipment/building or equipment components both unassigned and bespoke that are selected/created based on user-developed requirements specifications (URS)



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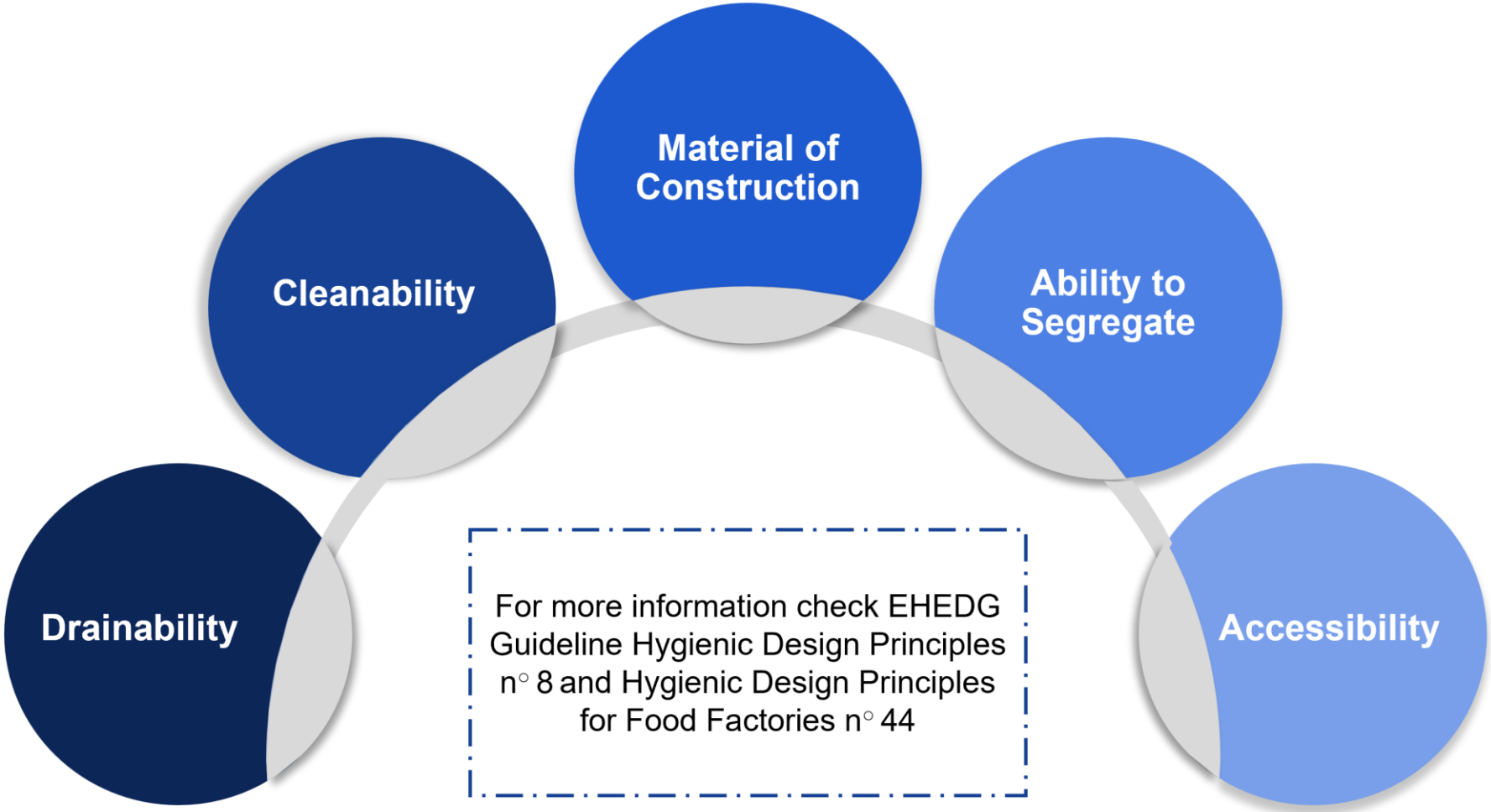
Hygienic Design Principles

Relevant for

- Equipment
- Building
- Utility design



Hygienic Design Principles

Material of Construction

Requirement

- Comply with relevant legislation and standards to ensure safe and high-quality food production.
- Resistant to product, process, and cleaning conditions to prevent chipping, flaking, wear, and foreign matter contamination.
- Selection should consider the interaction between product, process, and cleaning throughout the equipment lifecycle.

Compliance

Hygienic Equipment Design

Different Materials of Construction

Requirements

- **Select materials compatible with product, process, and cleaning conditions**
  (consider chemical resistance, temperature, mechanical stress, corrosion, and lifecycle performance)
- **Prevent contamination from material degradation or interaction**
  (avoid chipping, flaking, wear, absorption, or migration that can impact product safety or quality)
- **Ensure compliance, conformity, and traceability**
  (use materials meeting relevant legislation and standards, with documented declaration of conformity and full traceability)

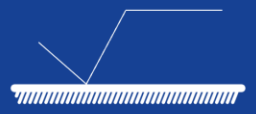
Hygienic Design Principles

Ability to Clean

Requirements

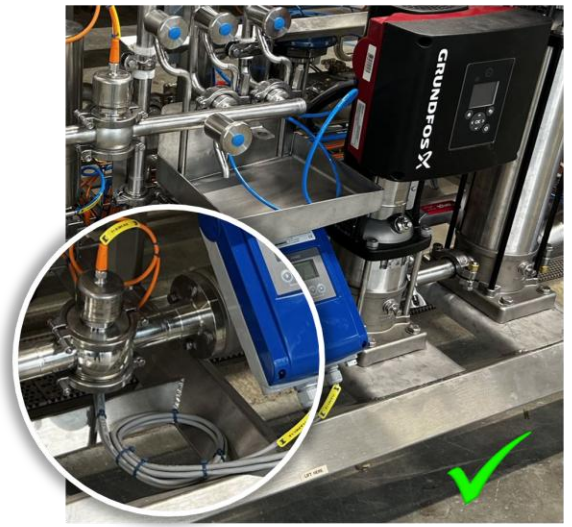
- Equipment, utilities, and building surfaces shall be designed to allow effective and complete removal of product residues and contaminants using appropriate cleaning methods.
- Cleanability shall be ensured under defined process and cleaning conditions, without the need for excessive time, chemicals, or mechanical action.

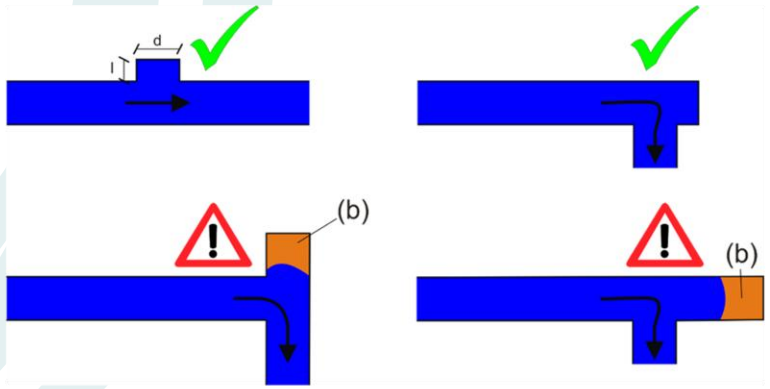
Important aspects

Surface roughness	Crevices and crack	Junctures and joints	Hygienic welding	Corners and dead ends
				

Hygienic Equipment Design

Cleanability example





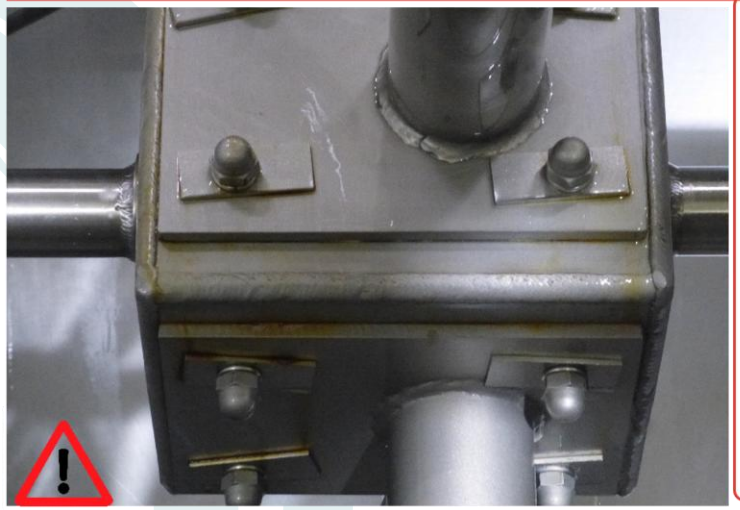
(a) product area, (b) dead leg with residual soil

Requirement

- Minimise dead ends, l/d < 1
- Consider flow direction
- Avoid sharp internal corners and sudden geometry changes (ensure smooth transitions to promote flow and cleaning)
- Ensure all surfaces are reached by cleaning media (avoid shadow zones or poorly flushed areas)

Hygienic Equipment Design

Dismantlable Joints



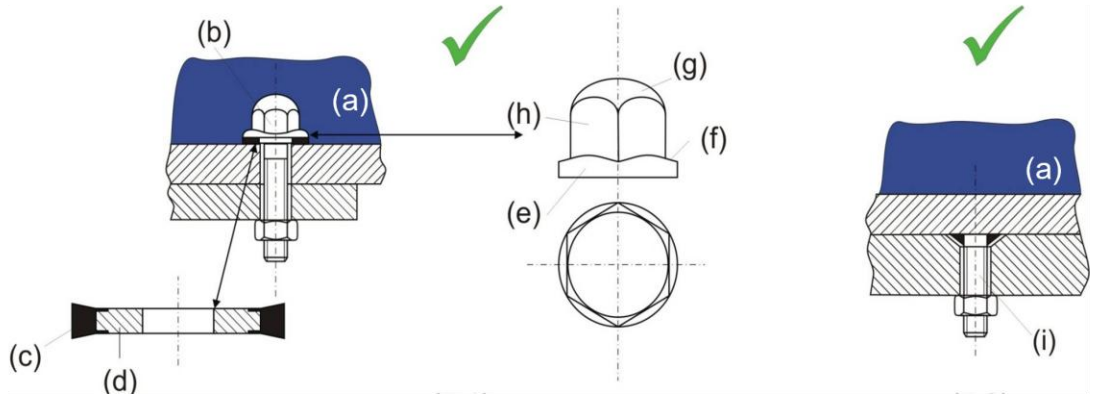
Requirement

Dismountable joints:

- fully sealed, flushed to product side
- without metal-to-metal contact
- with fixed compression, metal stop

Follow

- **Avoid crevices and gaps at interfaces** (prevent product or moisture ingress behind seals or components)
- **Ensure correct seal compression and positioning** (avoid over- or under-compression leading to retention zones)



(a) product area, (b) domed head, (c) elastomer, (d) metal, (e) circular collar (f) sloped, (g) domed, (h) hexagon, (i) stud

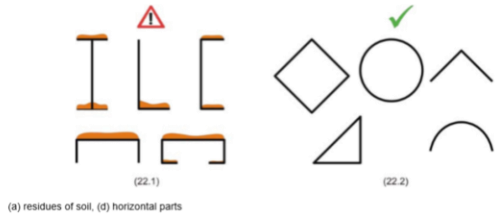
Hygienic Design Principles

Ability to Drain

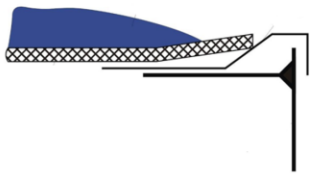
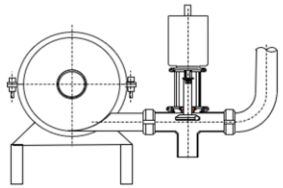
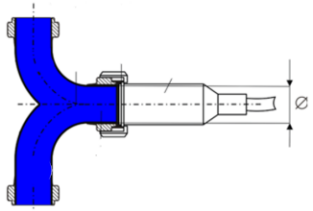
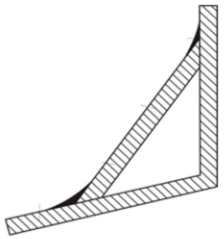
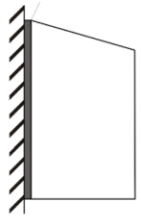
Requirement

Prevent accumulation and enable removal of:

- product
- water (wastewater, condensate)
- dust, dirt, debris

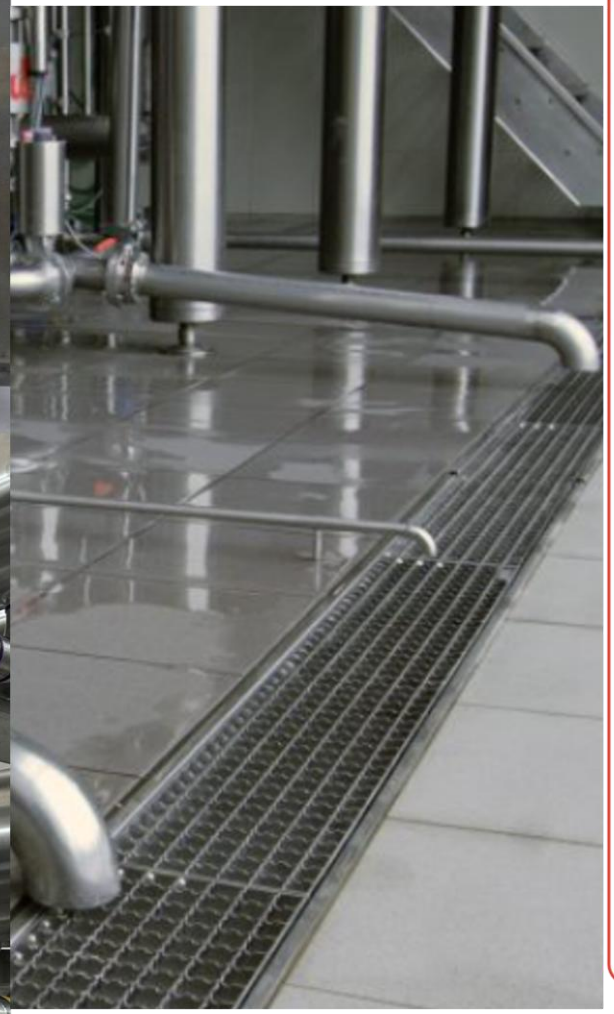


Key areas

Conveyor Belts	Pump Installation	Piping	Frameworks	Cabinets and cables
		 ©EHEDG		

Hygienic Equipment Design

Drainability



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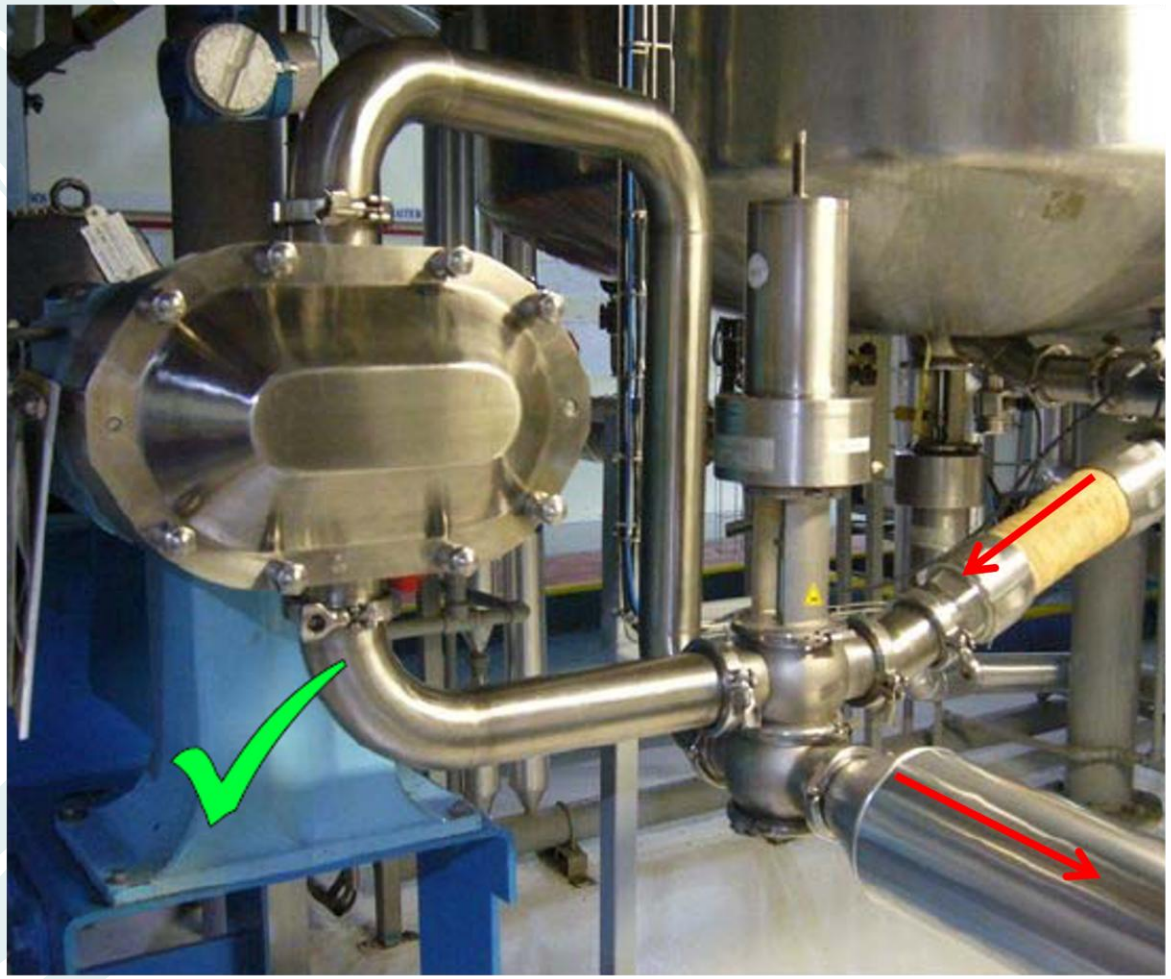
Requirement

- Design all surfaces to be self-draining
  (no horizontal surfaces, apply sufficient slope, ensure complete drainage of both internal and external surfaces)
- Prevent liquid and product retention
  (eliminate pockets, crevices, and low points in equipment, pipework, and surrounding structures where fluids can accumulate)
- Control and direct drainage away from product zones
  (ensure liquids are safely collected and removed, avoiding spread to critical areas and preventing recontamination)

Hygienic Equipment Design

Pump



Follow:

- Ensure full cleanability of all internal surfaces
  (no dead legs, smooth transitions, hygienic design of static and mechanical seals—flush, crevice-free, and compatible with CIP flow)
- Design for complete drainability
  (self-draining geometry, correct installation angle, no liquid retention in pump housing, seal areas, or connections)
- Apply hygienic seal design principles
  (static seals: no gaps, no product entrapment, correct compression
  mechanical seals: selected based on risk, designed to avoid stagnant zones, ensure cleanability of the product side, and compatibility with cleaning and process conditions)

Hygienic Design Principles

Ability to Segregate

Requirements

- **Design site and building layout based on hygiene risk**
  (consider plot size, positioning of buildings, zoning of hygiene areas, and separation of activities)
- **Control external and internal flows**
  (location of entrances, loading bays, waste areas, and traffic routes; define unidirectional flows of people and materials)
- **Account for environmental influences**
  (wind direction, drainage, dust, pests, and surrounding activities to prevent ingress and cross-contamination)

Key points

Layout of Premises	People Flow	Material Flow	Equipment and Process Design

Plant Layout and Zoning

Zoning Definition: Physical division of the plant into sub-areas, leading to segregation of different activities with different hygiene levels.

Zoning areas

High Hygiene Zones

Areas where products with high-risk category are exposed and vulnerable to contamination, for example ready-to-eat (RTE) foods, API, infant formula that won't undergo further lethal processing.

Medium Hygiene Zones

Can be a process area for products where the consumer group is not especially sensitive and/or where no further growth is possible in the supply chain.

Medium hygiene areas can be the intermediate area before entering a high hygiene zone.

Basic Hygiene Zones

Areas with minimal risk of direct product contamination and where products are not susceptible to (re) contamination, being already protected in their final packaging; such areas can be at the end of a packaging line or the finished goods warehouse.

Hygienic Design Principles

Ability to Segregate

Requirements

- **Separate incompatible process streams**
  (e.g. raw vs processed product, product vs CIP fluids)
- **Prevent cross-contamination by design**
  (use hygienic components such as double seat valves, proper sealing, and controlled interfaces)
- **Ensure integrity during all operating conditions**
  (including start-up, shutdown, and cleaning to avoid unintended mixing or leakage)

Key Points to Prevent

Hygienic Equipment Design

Segregation

Requirement

- Prevent unintended release or ingress of product and contaminants
- Minimise product exposure to the environment

Solution examples:

- Design closed or contained systems where required (e.g. dust-tight equipment for dry processing)
- Apply hygienic sealing and controlled interfaces(e.g. hygienic closures, connections, and transfer points)
- Use risk-based separation of process streams (e.g. tank vent design—cleanable, filtered, or bacteria-tight depending on application)

Hygienic Equipment Design

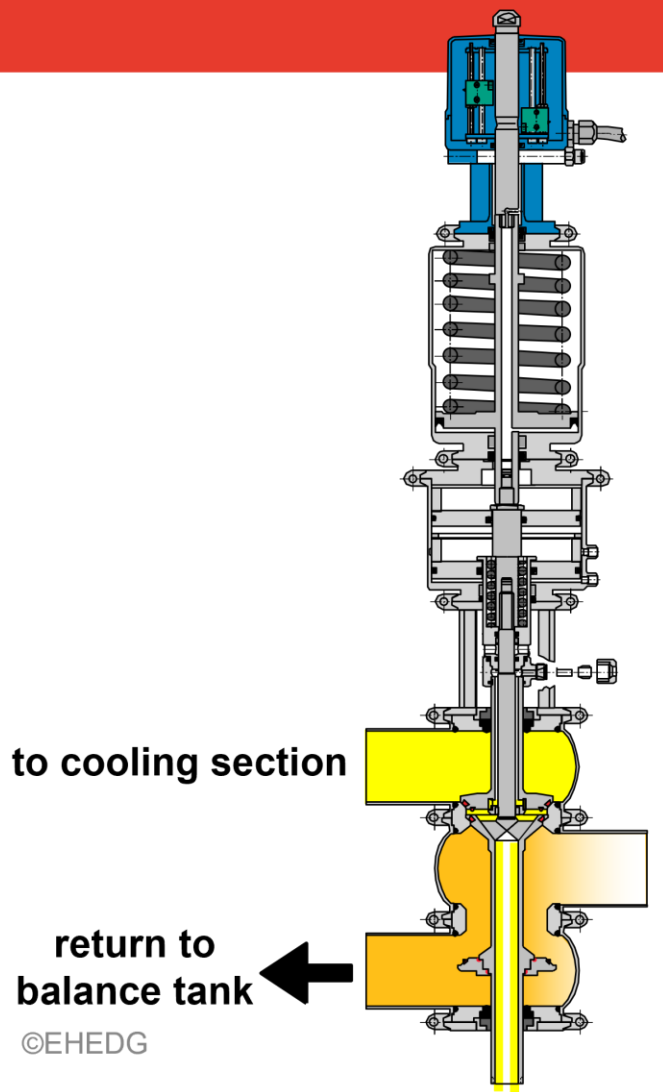
Segregation in a valve example

Requirement

- Ensure segregation of incompatible process streams (e.g. raw vs processed product, product vs CIP fluids)
- Prevent cross-contamination under all operating conditions (including normal operation, switching, and cleaning)

Follow:

- Use hygienic valve designs that provide physical separation
- Ensure cleanability and control of the separation zone (e.g. seat lifting, leakage detection, and cleanable intermediate space)
- Apply risk-based selection of valve design (based on product risk, process conditions, and potential consequences of mixing)



For example, a double seat prevents that insufficiently pasteurised product contaminates the already pasteurised product downstream.

Hygienic Design Principles

Ability to Access

Requirement

- **Provide access to all critical areas**
  (product contact, surrounding environment, and utility interfaces)
- **Enable effective cleaning, inspection, and maintenance**
  (either through direct access or by validated cleaning systems such as CIP)
- **Avoid inaccessible or hidden zones**
  (no areas where contamination can accumulate without detection or control)

Key aspects

Hygienic Equipment Design

Accessibility

Requirement

- All product contact surfaces (direct and indirect) should be accessible for cleaning and sanitation

Follow:

- Remove unnecessary components from product zones (e.g. cabling, utilities) or redesign them to be hygienic
- Ensure full accessibility so all areas can be easily reached, cleaned, and inspected
- Prevent product accumulation by design (eliminate dead zones, ledges, and hard-to-clean geometries)

Hygienic Equipment Design

Insulation

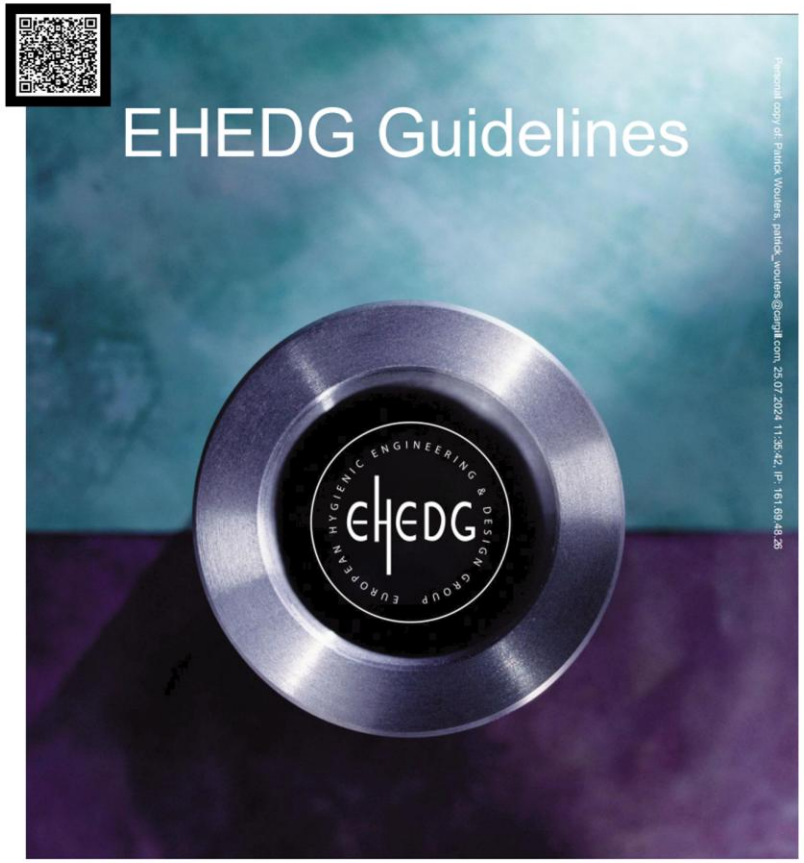
Requirement

- Hygienic insulation to prevent pest and moist ingress

Solution:

- Design without crevices or metal to metal contact (seals or permanent joints)
- Create accessibility for inspection, cleaning, maintenance

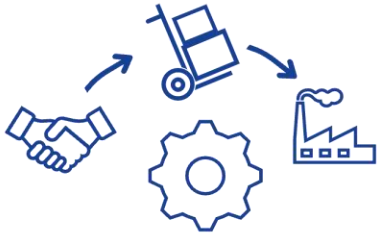
Hygienic Design Risk Management (HDRM)



This guideline provides a step-by-step approach to assessing and managing food safety and hygiene risks by hygienic design of food manufacturing buildings and equipment, in accordance with existing standards and GFSI scopes JI and JII requirements.

This HDRM can be applied from:

User perspective to support food safety management programs and/or design specifications.



Supplier perspective when designing, fabricating and commissioning buildings or equipment.

In Summary

Hygienic design not only mitigates food safety risks but also significantly influences food quality compliance and operational performance, including efficiency and sustainability

A structured risk management approach, combined with proper validation, verification, and maintenance, ensures compliance and product integrity

By applying hygienic design principles, companies can optimize their processes while minimizing contamination risks

From facility layout to equipment accessibility, every element must prioritize cleanliness, safety, and efficiency

THANKS!

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A Brief History of the 3-A Sanitary Standards & The Grade A Pasteurized Milk Ordinance.

Presented by

Dan Erickson, Dairy Foods Safety Auditor and 3-A CCE

Harold Wainess & Associates

Genesis of the 3-A Sanitary Standards

- The “3-A” designation is derived from the three interest groups represented in this 3-A Sanitary Standards and Practices writing organization. The Food Production Solutions Association (FPSA), the International Dairy Foods Association (IDFA) and the International Association for Food Protection (IAFP).

Genesis of the 3-A Sanitary Standards

- The International Association of Milk Inspectors was established in 1911 at a Cattle Show in Milwaukee, Wisconsin. Two of the attendees were from outside of the US. One from Canada and from Australia making that first meeting “International”. The organization later became the International Association of Milk, Food and Environmental Sanitarians. (IAMFES), now known as the International Association for Food Protection (IAFP) since 2001.

Environmental Health Sanitarians were dropped from the title due to a requirement for this group of Sanitarians to carry a registration under the supervision of National Environmental Health Association (NEHA).

The IAFP celebrated 100 years of operation in 2011 at the Milwaukee Wisconsin Convention Center near where it all started.

Genesis of the 3-A Sanitary Standards

- During the early years of the organization, the discussions of these “Dairy Regulatory Sanitarians” was centered on the safety of the milk supply which with an increase of milk products being distributed to the general public as populations worldwide were moving away from an agrarian model to more urban societies. Disease transmission through the milk supply was becoming more evident as people moved away from the farm environment.

Genesis of the 3-A Sanitary Standards

- Pasteurization was not widely recognized in the early days of these organizations however; food safety research and discoveries of the famous French researcher; Dr. Louis Pasteur were being heavily considered. These early “Sanitarians” were seeing the problems of mechanized farm practices and the lack of “sanitary conditions” from on-farm milk harvesting equipment, product transportation to processing facilities and product delivery to urban consumers.

Dr. Louis Pasteur

Genesis of the 3-A Sanitary Standards

- The first version of what we now call the Grade A Pasteurized Milk Ordinance was released in 1924. Early guidance documents on the “Sanitary” construction of equipment used for the collection, storage, transportation of milk from farms to processing plants were written however, remained regionally enforced. The first National Conference on Interstate Milk Shipments (NCIMS) was organized and held in 1950. The title, “Grade A Pasteurized Milk Ordinance” was adopted in 1965.
- The US FDA Milk Safety Team has an equipment review process for the Grade A Program. Opinions on PMO compliance are issued under the M-b program.

PMO Section 7 Item 11p. Page73.
2023 Revision
Reference to 3-A Sanitary Standards

- **Construction and Repair of Containers and Equipment**

- **NOTE:** 3-A Sanitary Standards and Accepted Practices for dairy equipment are developed by 3-A SSI. 3-A SSI is comprised of equipment fabricators, processors, and regulatory sanitarians, which include State milk regulatory officials, USDA Agricultural Marketing Service Dairy Programs, the USPHS/FDA CFSAN/MST, academic representatives and others.
- Equipment manufactured in conformity with 3-A Sanitary Standards and Accepted Practices complies with the sanitary design and construction standards of this *Ordinance*. For equipment not displaying the 3-A Symbol, the 3-A Sanitary Standards and Accepted Practices may be used by Regulatory Agencies as guidance in determining compliance with this Section.

Genesis of the 3-A Sanitary Standards

- During the period after World War II, the Dairy Industry was changing quickly as Pasteurization was becoming common place and required by many states and municipalities across North America. During this same period Dairy Sanitarians were working in collaboration with the Dairy Industry and Dairy Equipment Manufacturers to formulate the 3-A Sanitary Standards and Practices.
- A Group called the 3-A Symbol Council managed the issuance of 3-A Symbol Use Authorizations for Equipment Manufacturers.

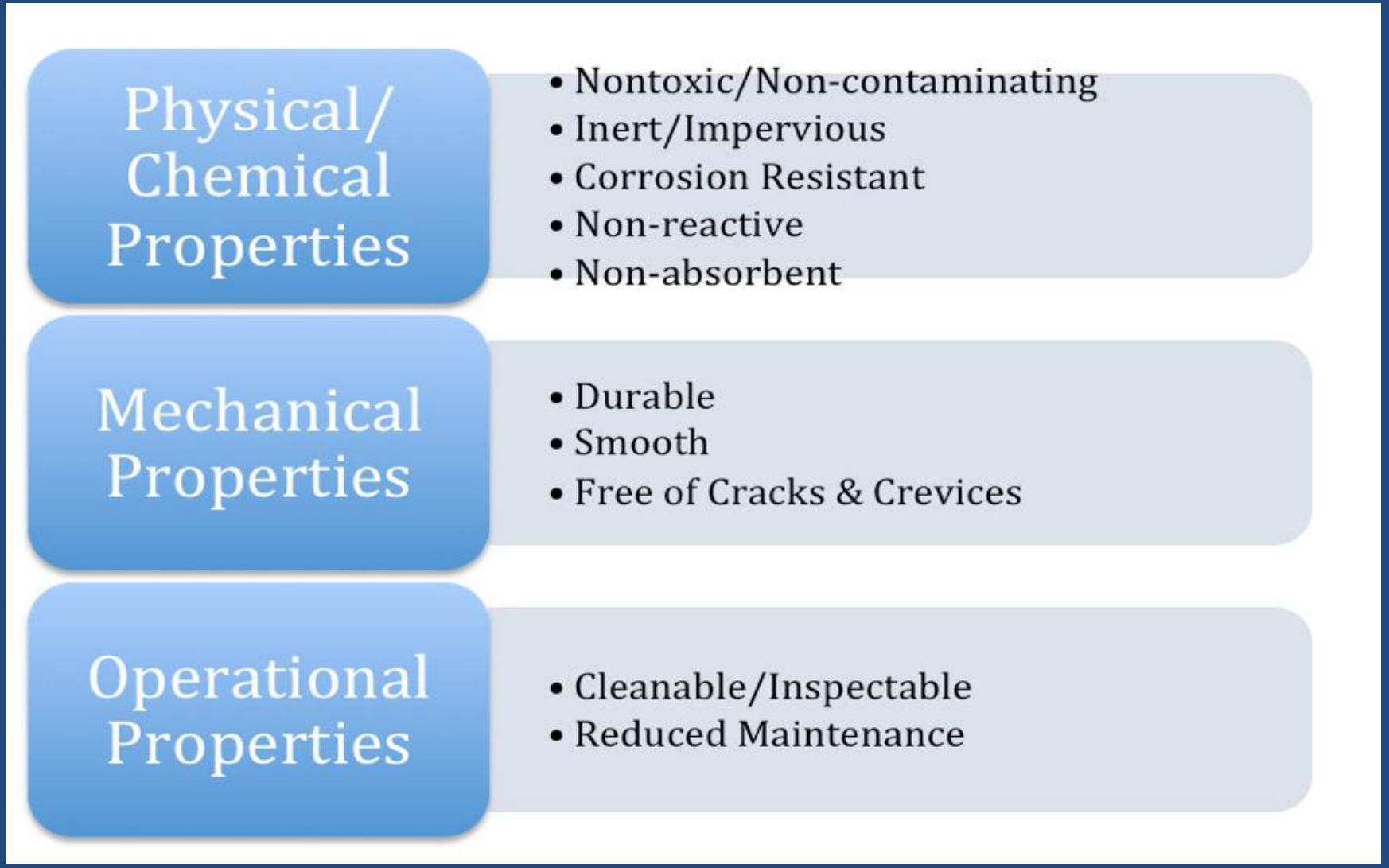
3-A Sanitary Standards Now

- Membership on the IAMFES 3-A Committee of Sanitary Procedure (3-A CSP) was at one time exclusive to Dairy Regulators and University Level Professors acting as scientific advisors.
- The IAFP Board of Directors voted to end the organizations support of the 3-A CSP at the 2025 IAFP Annual Business Meeting.

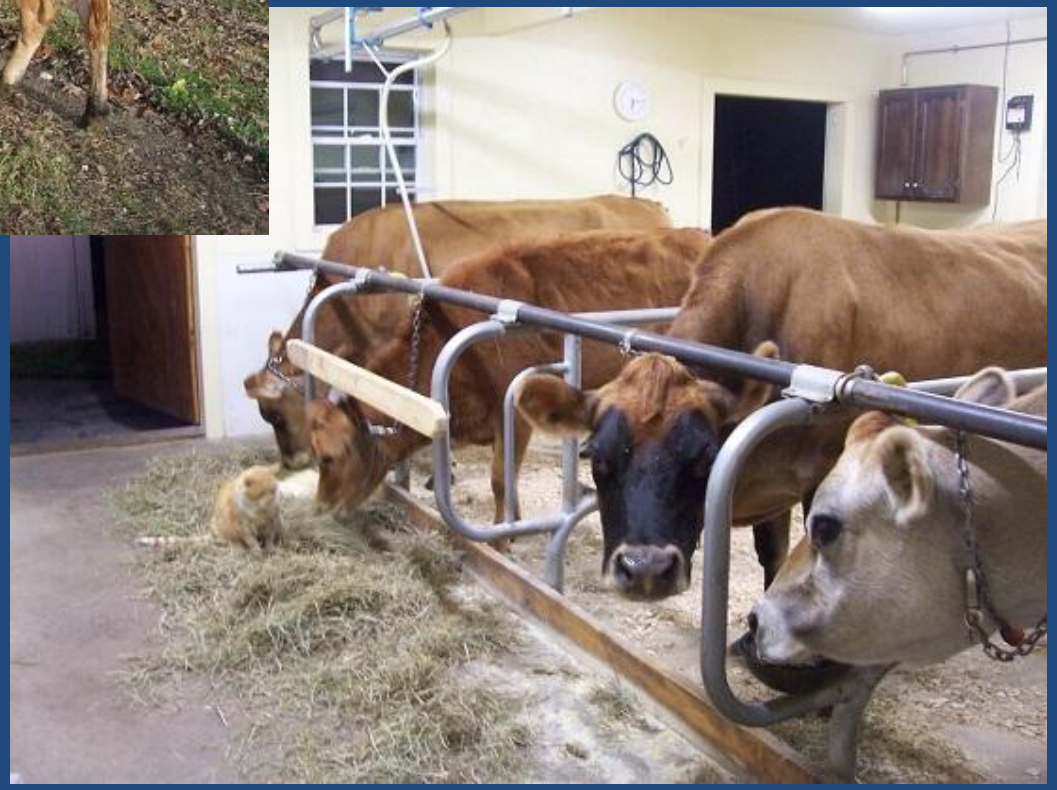
3-A Sanitary Standards Now

- 3-A Symbol Use Authorization is now managed by 3-A Sanitary Standards, Inc. which was implemented in 2003.
- Applicant Equipment Manufacturers need to audited by a 3-A Certified Conformance Evaluator (3-A CCE). 3-A CCE's are vetted and pay an annual license fee to maintain their status with 3-A SSI. This includes attendance at annual CCE training sessions both in-person and virtual sessions.

3-A Sanitary Standards




No calf, no man and no machine can do a safe, complete and satisfactory job of milking cows without TUG & PULL.
That's one of the big reasons why–in 1950–more thousands of farmers than ever before switched to Surge. Not just more farmers but more *thousands* of farmers.
Milk with Genuine Surge Tug & Pull
BABSON BROS. CO.



The Cow

Milk Haulers/Samplers

Landmark milk contamination case sends farmer to jail

By Mindy Desens
The Land Contributing Writer
From Stearns County

BELGRADE — Minnesota statute 32.21 begins: No person shall sell or knowingly buy unwholesome or adulterated milk or cream.

In violating this law, Roger Imdieke may be the first person in the state — possibly even the first in the nation — to serve jail time for selling contaminated milk.

Imdieke was charged for two misdemeanors in 1982 when measurable levels of penicillin were found in milk samples drawn at his farm. Hoping to prove the 1921 statute to be outdated and unfairly weighted against dairy producers, he took his case to a jury trial but was convicted on both counts in 1983. In an appeal, the state Supreme Court upheld the convictions, and on June 13 of this year, 7th District Judge Willard Lorette sentenced Imdieke to 30 days in jail plus a $1,000 fine.

"I argued that a jail term be included because of the defendant's prior history," explained prosecuting attorney Elizabeth Hayden of Stearns County Attorney's Office. "We had been notified of prior violations and a prior conviction with suspended sentence."

In fact, the Belgrade farmer had been warned a total of nine times since 1978 for selling contaminated milk. The court took serious note of that fact in sentencing him.

State's biggest concern

According to Bill Coleman, director of dairy industries division of the state Department of Agriculture, this problem can't be taken seriously enough. "I'd have to say that our biggest ongoing concern in the Minnesota state dairy industry is antibiotic contamination," he said. He pointed out that his agency recognizes that accidents occur; each situation is examined closely and warnings are usually issued before any legal action is taken.

"It's possible for a family member to treat a cow and forget to mark her," he said. "In some cases, a contaminant may be found simply because the individual animal metabolizes it more slowly than usual, although this factor is taken into consideration when time limits are determined." But Coleman is aware of another, more serious cause of antibiotic contamination. "Today's economic situation sometimes plays a part. A farmer thinks: 'Here's my cow producing 90 pounds of milk a day — I can't just throw it away' — and so he tries to slip it in. But, I don't think that kind of attitude is really prevalent. Most farmers are really conscientious and a large part of the contamination cases are accidental."

Imdieke, who is on a work-release from 5:30 a.m. to 8 p.m. so he can continue to farm, expressed surprise at the sentence he was given for his violations, "considering the circumstances," he said. "I wasn't even present three times that it happened. But the law doesn't call for proving any intent."

In fact it's the law itself with which Imdieke takes issue. "I'm not making excuses for what happened," he said. "But what disturbs me the most — and why we pursued it the way we did — is the fact that they're using a 1921 law that affects the farmers but leaves the milk processors immune."

He cited a 1978 federal law that allows for an "actionable level" of antibiotic to be present. In other words, a minute level of medication that won't affect the quality or safety of the processed milk, according to Imdieke.

Coleman argued against Imdieke's assertion that the 1921 law is outdated. "We've had antibiotics since then," he said. Even so, this precedent-setting case will "most definitely" have an effect on the statute. "Many states treat this sort of thing almost as they would a traffic violation," he said. A sizable fine is automatically leveled against offenders, and that fine is increased substantially with each infraction. "Maybe that's what we need in Minnesota," he reasoned. "The pocketbook counts a lot to a farmer today." Coleman noted that he's spoken recently with legislators who are interested in making the law more specific and more enforceable. "As it is now, a farmer in violation frequently just gets slapped with a warning and a 50 dollar fine."

If the law is changed, then Roger Imdieke said he believes he'll have accomplished one of his primary objectives. "Supposedly the Minnesota Department of Agriculture has made the review of this statute number one in their priorities for the next legislative session."

Nevertheless, the ramifications of marketing contaminated milk are far-reaching, and all farmers need to be made aware of that fact and of their responsibility. According to Coleman, not only is the economy of the dairy industry affected when processors are forced to turn large batches of otherwise-good milk into animal feed, but antibiotic-tainted milk poses a genuine health risk to individuals with allergic sensitivities. He's personally aware of the risk; his sister, who lives in another state, is allergic to penicillin. Twice in recent years she has been made seriously ill from drinking milk that later was found to have been contaminated with the antibiotic.

Imdieke is understandably cautious since the 1982 violations. "I test my own milk," he said, "and I have thrown it out when there's a question." He pointed out that the test for contaminants takes three hours to obtain a culture, so it's not always feasible. The availability of a new, faster-testing method, soon to be on the market, should help the farmer in monitoring his or her own milk production.

Coleman made a final point concerning the Imdieke case: "I hope other producers won't think the state is out to get them. That's not our interest at all. We just want to make sure that antibiotics stay out of the milk supply, not just for our own sake as a regulatory agency, but for the economic interest and welfare of the public." He added, "Eighty percent of Minnesota milk now moves out of state. If we want to keep it moving we've got to be careful of this kind of thing."

Imdieke summed up his own feelings when he said, "I'm not making excuses, but there certainly wasn't any intent here to sell contaminated milk. I just think that the producer and the processor should be treated equally. As it is now, the processor is protected by the word "knowingly" in the old statute."

SAINT PAUL PIONEER PRESS

25 TH APRIL 1993 SUNDAY

BUSINESS

TWIN CITIES

F D SECTION 8 PAGES

A driver prepares to unload his milk at the Schroeder Milk Co. in Maplewood. JOE ROSSI/ PIONEER PRESS

The milk industry is churning, with tanker trucks carrying Minnesota milk to Wisconsin and Wisconsin milk back here. It's the unexpected result of a law that was supposed to improve state dairy farm income.

How Minnesota's Milk Law Went Sour

BY LEE EGERSTROM
STAFF WRITER

Odds are, the milk you poured on your breakfast cereal today came from a Wisconsin cow, even if the carton lists a Minnesota dairy. And it's a good bet the Wisconsin-made cheese you'll melt on your lunch hamburger started with a cow on the Minnesota side of the border.

If you think that's strange, try this: The tankers hauling Minnesota milk to Wisconsin and vice-versa may well have passed on the road.

The criss-crossing milk trucks are the result of a well-intentioned law from the 1992 Minnesota Legislature that took a wrong turn. Last week, the Legislature tried to rectify the mistake with new dairy legislation that has the same aim but different procedures.

Last year's law was designed to help the state's dairy industry by putting a minimum price on milk for drinking. But the milk law went sour in December when a federal judge in Minneapolis ruled that Minnesota couldn't set a minimum for milk produced in other states.

Around the same time, farm milk prices started falling. The price gap between Minnesota milk and milk from surrounding states widened as the Minnesota minimum kicked in.

The result, say dairy industry officials: More Grade A Minnesota milk is being turned into butter, cheese and ice cream at Wisconsin manufacturing plants, where the higher prices don't apply. And more Wisconsin milk — which is not affected by the Minnesota minimum — is being trucked in to displace local milk in Minnesota's fresh milk market.

Despite all the fuss, milk prices for Minnesota consumers have stayed fairly level. "Some bottlers or retailers must have eaten the difference, because 2 percent drinking milk has averaged $2.59 a gallon for about six months," said Rep. Steve Wenzel, DFL-Little Falls, who is chairman of the House Agriculture Committee.

"It's a bizarre set of circumstances," said Paul Christ, vice president of public policy and analysis at Land O'Lakes in Arden Hills. "But it will be corrected. No one in the dairy industry wants to keep this in place."

Only individual dairy companies know how much milk has cruised the interstate highways during the past four months. "We don't keep that kind of records," ex-

MILK CONTINUED ON 4D ▶

The Minnesota milk price mess

March 24, 1992
Minnesota Legislature passes law setting minimum farm price for Grade A drinking milk at $13.20 for 100 pounds, $1.50 above federal minimum price. Aim is to help state dairy farmers.

Aug. 14, 1992
Minnesota Agriculture Department issues rules requiring processors to collect the difference between the market price of milk and the mandated minimum, and give the money to a state pool to compensate Minnesota dairy farmers. Applies to all milk bottled in Minnesota, whether produced here or in other states.

Dec. 22, 1992
A federal court rules that this is an unconstitutional tax on milk imported from other states. The law can apply only to milk produced and bottled in Minnesota.

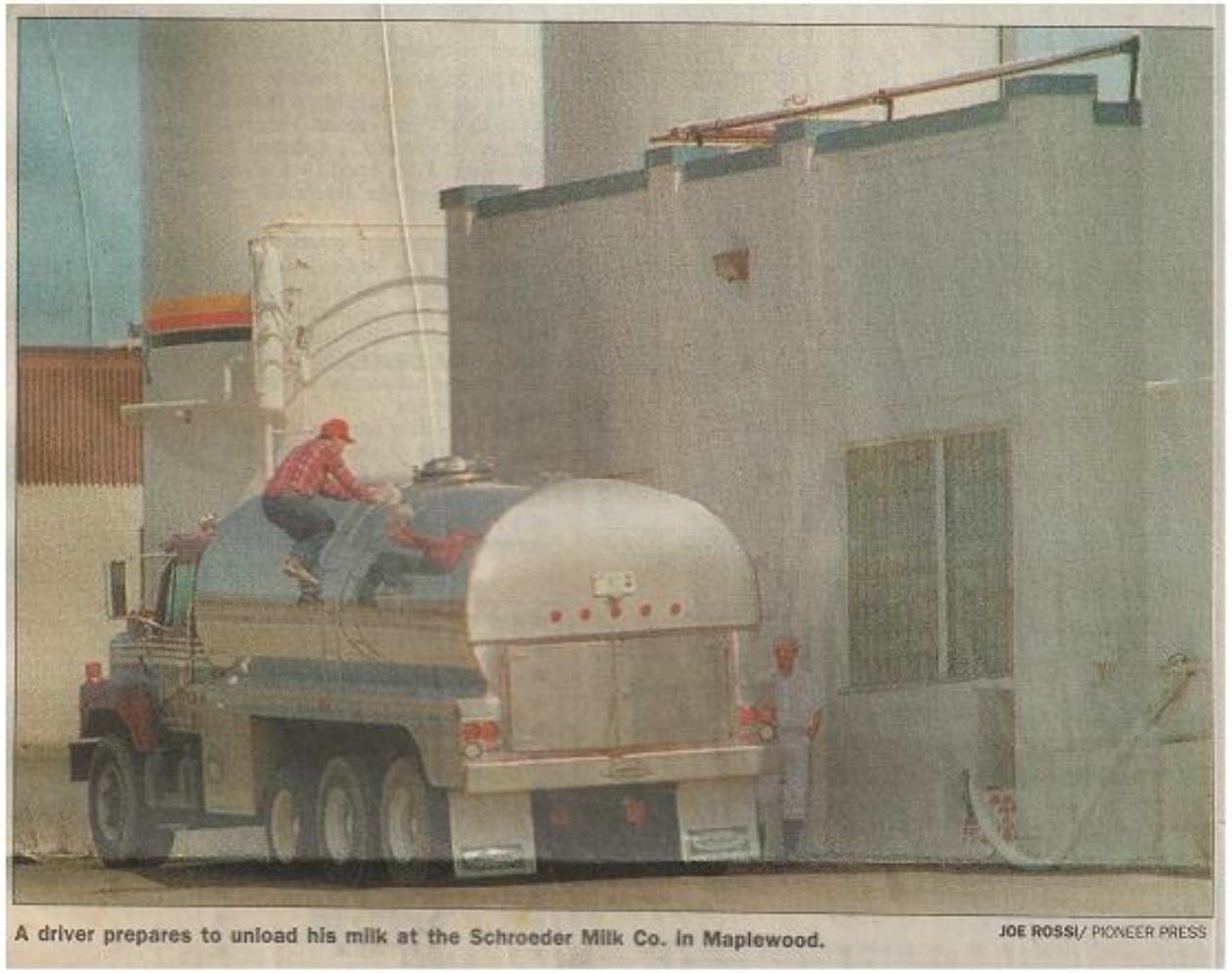
January 1993
Dairy companies begin shipping Minnesota milk to Wisconsin cheese plants, and Wisconsin milk to Minnesota bottling plants, to avoid Minnesota's milk tax. The difference between Minnesota and Western Wisconsin milk prices is 16 cents for 100 pounds.

February 1993
Minnesota legislators introduce bills to change state dairy laws. Price difference widens to 66 cents for 100 pounds.

March 1993
Price difference grows to $1.11 for 100 pounds. More Wisconsin milk comes to Minnesota, and state dairy groups ask Legislature to repeal old law fast.

April 1993
Minnesota Legislature votes to repeal 1992 law, which should end the milk shuffle across the border. But new law establishes a minimum retail price for milk that could raise Minnesota consumer prices 20 cents a gallon higher than in Wisconsin.

PMO Section 7. Item 15p.(A).3b. “Protection from Contamination”



A driver prepares to unload his milk at the Schroeder Milk Co. in Maplewood.

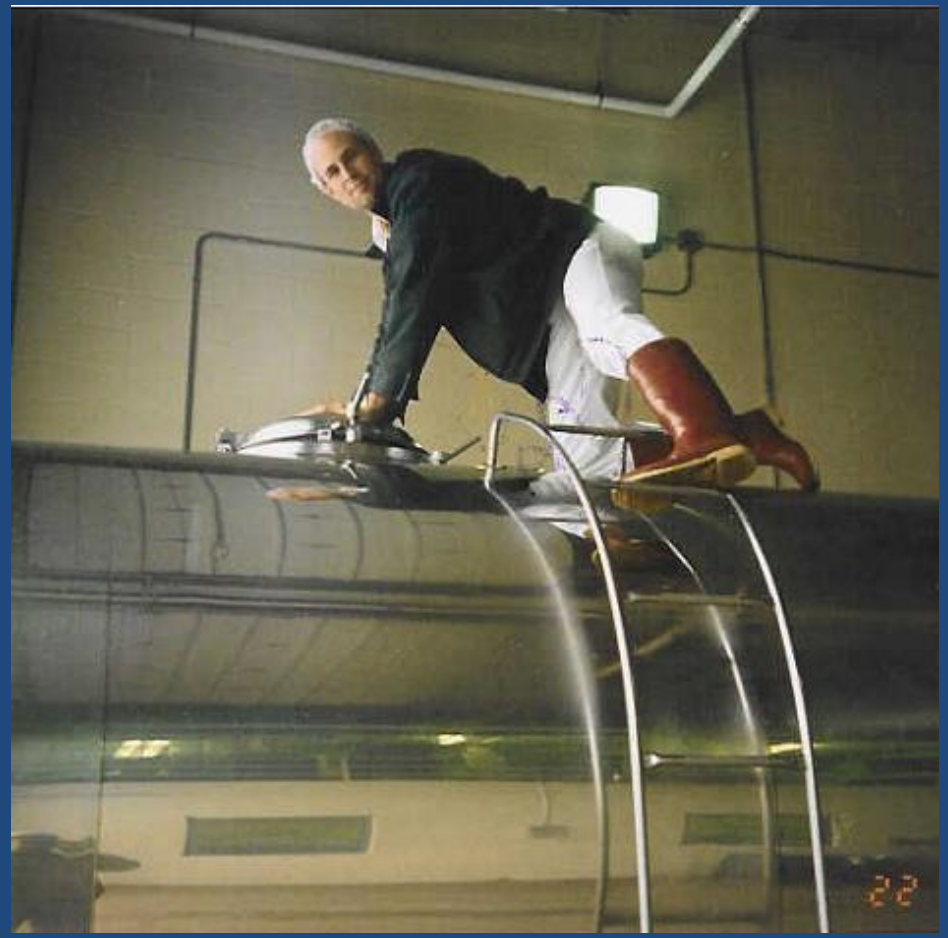
JOE ROSSI/ PIONEER PRESS

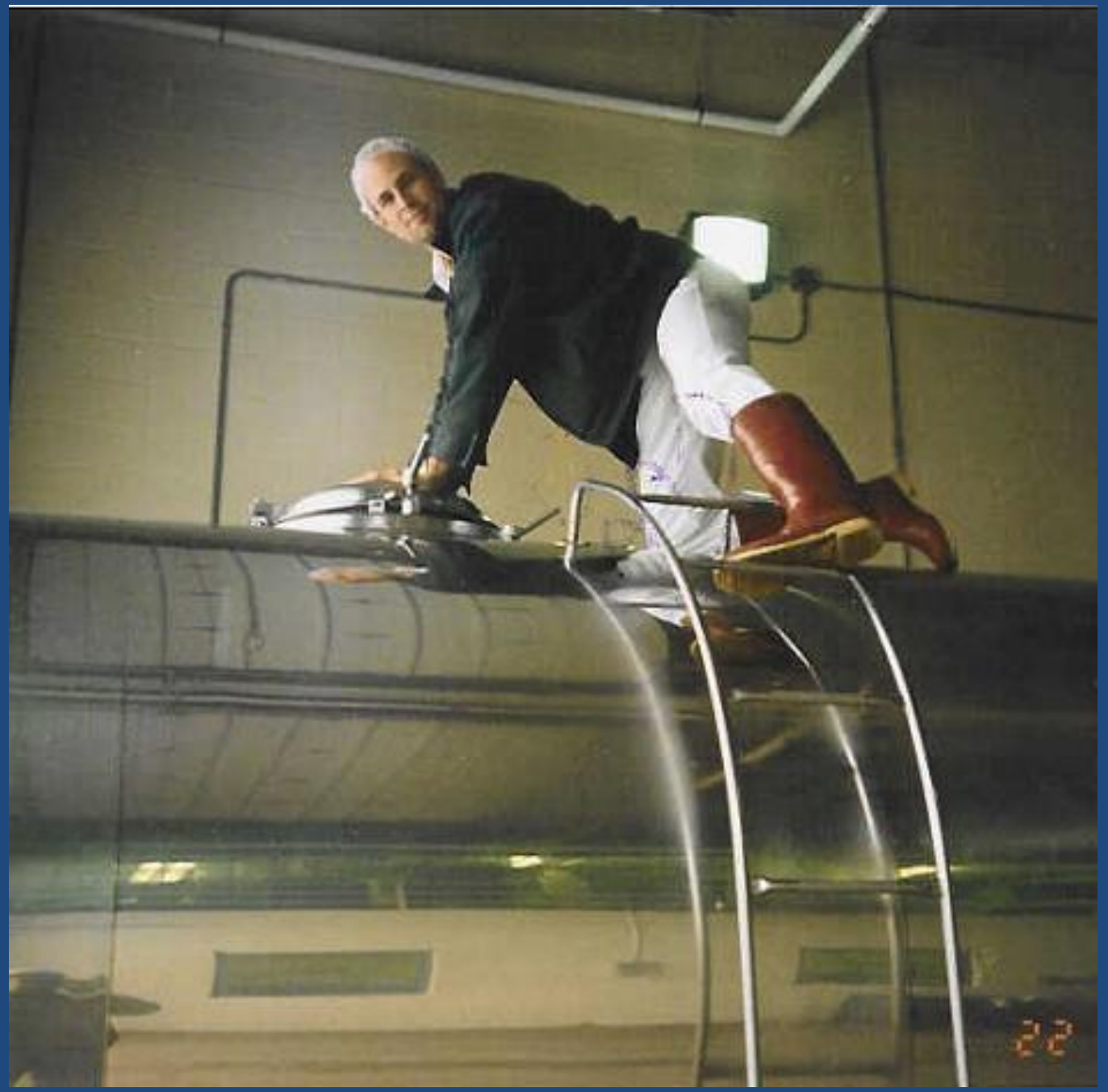
PMO Section 7. Item 15p.(A).3b. “Protection from Contamination”

- b. If the area is not completely enclosed or doors of the unloading area are open during unloading, a suitable filter is required for the manhole or air inlet vent and suitable protection shall be provided over the filter material either by design of the filter holding apparatus or a roof or ceiling over the area. When weather and environmental conditions permit, manhole openings and covers of milk tank trucks may be opened outdoors for the short period of time necessary for the collection of samples for animal drug residue screening.

PMO Appendix N
Becomes part of the PMO in 1995

- Requires that every load of milk received be tested for animal drug residues everyday!
- Sample collected from each tank compartment for testing.
- Sample collected by responsible individual.
- Testing is done by certified analysts.
- A positive test can not become negative.



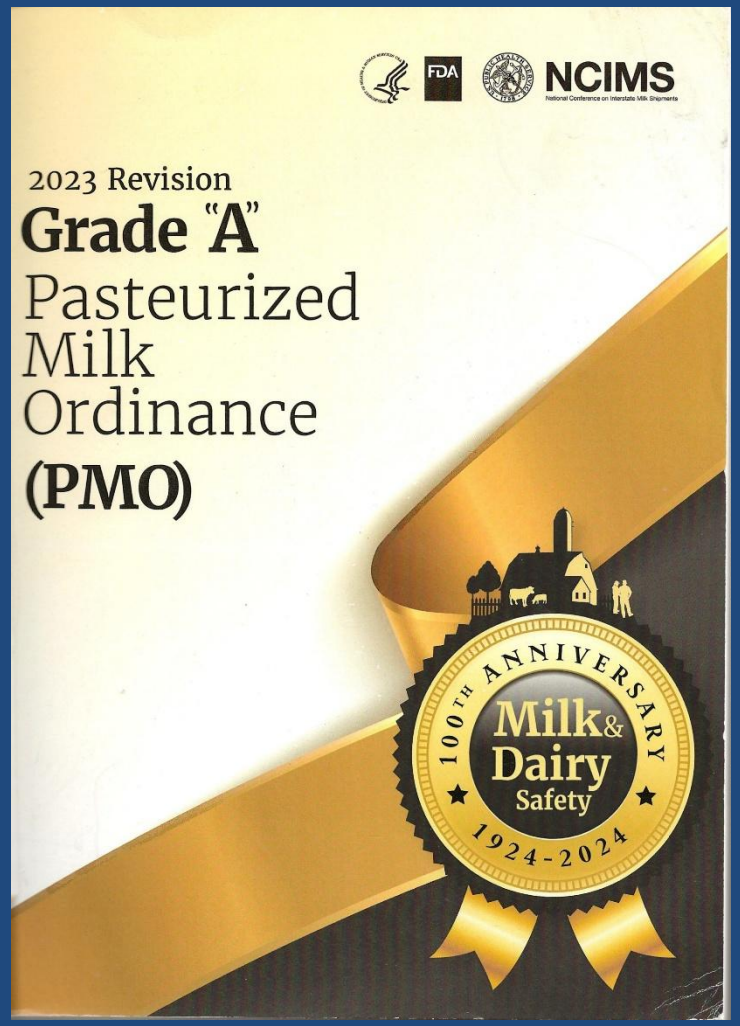


Grade "A"
Pasteurized
Milk
Ordinance

(Includes provisions from the Grade "A" Condensed and Dry Milk Products and Condensed and Dry Whey--Supplement I to the Grade "A" PMO)

2017 Revision

U.S. Department of Health and Human Services
Public Health Service
Food and Drug Administration



FSMA 2011

- Food
- Safety
- Modernization
- Act

FSMA Implementation for “Dairy” began in September 2018

Appendix “T” placed in the 2017 Revision of PMO.

The first dairy companies to be evaluated under this HACCP based inspection program by the US FDA completed an Appendix “T” evaluation.

Under PMO Appendix “T” Equipment and Processes need to be evaluated to ensure that the systems are cleanable and properly cleaned after each day used. “The 3-A Sanitary Standards are a building block for verifying this requirement.”

3-A Symbol Use Authorization and the EDTCF

- Engineering, Design and Technical Construction File
- An EDTCF, Table of Contents is to be on hand for the audit visit.

Display of the 3-A Symbol

Display of the 3-A Symbol


53-02
www.kaoflit.dk
1.4404
227053

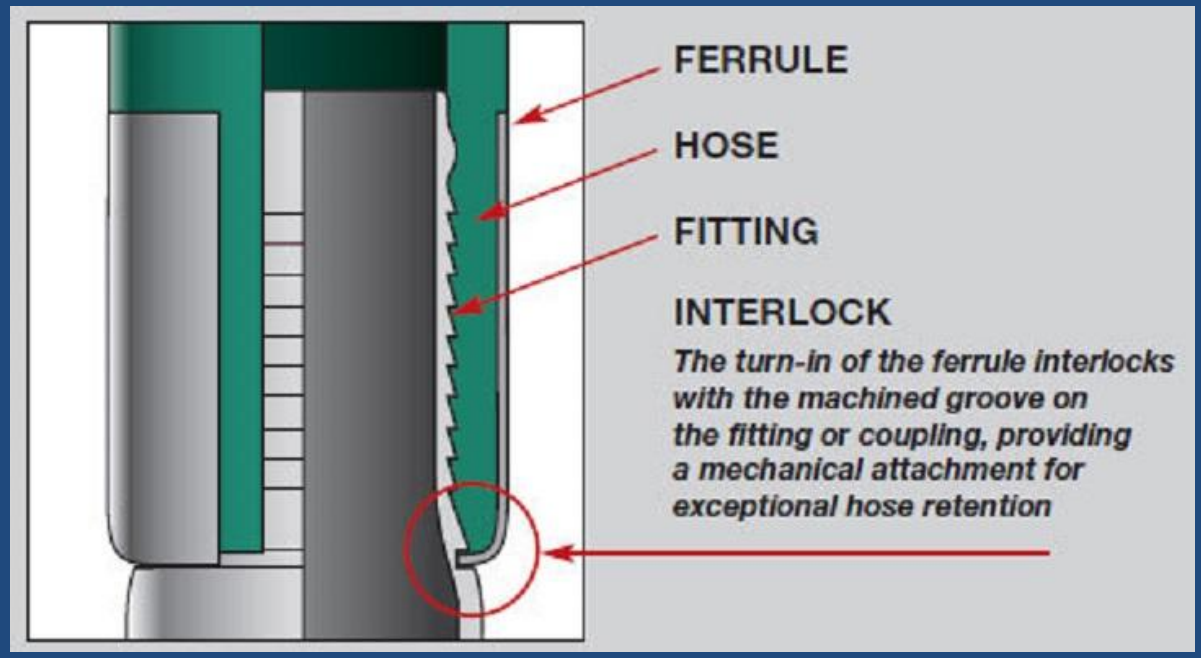
3-A Sanitary Standards and Practices


CERTIFIED
EHEDG
TYPE EL
AUGUST 2006
3A

Slip Joints

(No longer allowed in Plant applications).

Hose Assemblies (62-02)



Quality Management Program

- 3-A CCE's are required to evaluate a 3-A Symbol Use Authorization Applicant's QM, QA or QC Program. While an ISO 9001-2015 certificate is not required under the 3-A TPV program, having a certified program is considered a plus and is recorded by the CCE's in the Third-Party Verification (TPV) Audit report.
- On-site Audit Visits are required. In some very limited cases a Virtual Audits can take the place of Onsite visits.

Material Selection

- Rubber and Rubberlike Materials
- Plastic Materials

    3-A Sanitary Standards for Rubber and Rubberlike Materials #18-03

    3-A Sanitary Standards for Plastics #20-27

<u>These standards contain test criteria for a material's compatibility with product and the ability to withstand the environment of intended use!</u>

3-A Sanitary Standard for General Requirements
ANSI/3-A 00-01-2018

D1.2 **Nonmetals**

D1.2.1 Plastic, rubber and rubber-like materials may be used for gaskets or seals. When permitted by specific equipment 3-A Sanitary Standards or 3-A Accepted Practices, plastic, rubber and rubber-like materials may be used for other components.

D1.2.1.1 Plastic, rubber and rubber-like materials, when used as product contact surfaces, shall be inert and non-toxic, nonabsorbent, fat-resistant, relatively resistant to scratching, scoring, decomposition, crazing, and chipping under normal use and when exposed to the conditions encountered in the environment of their intended use, including cleaning, sanitizing treatment, and/or sterilization.

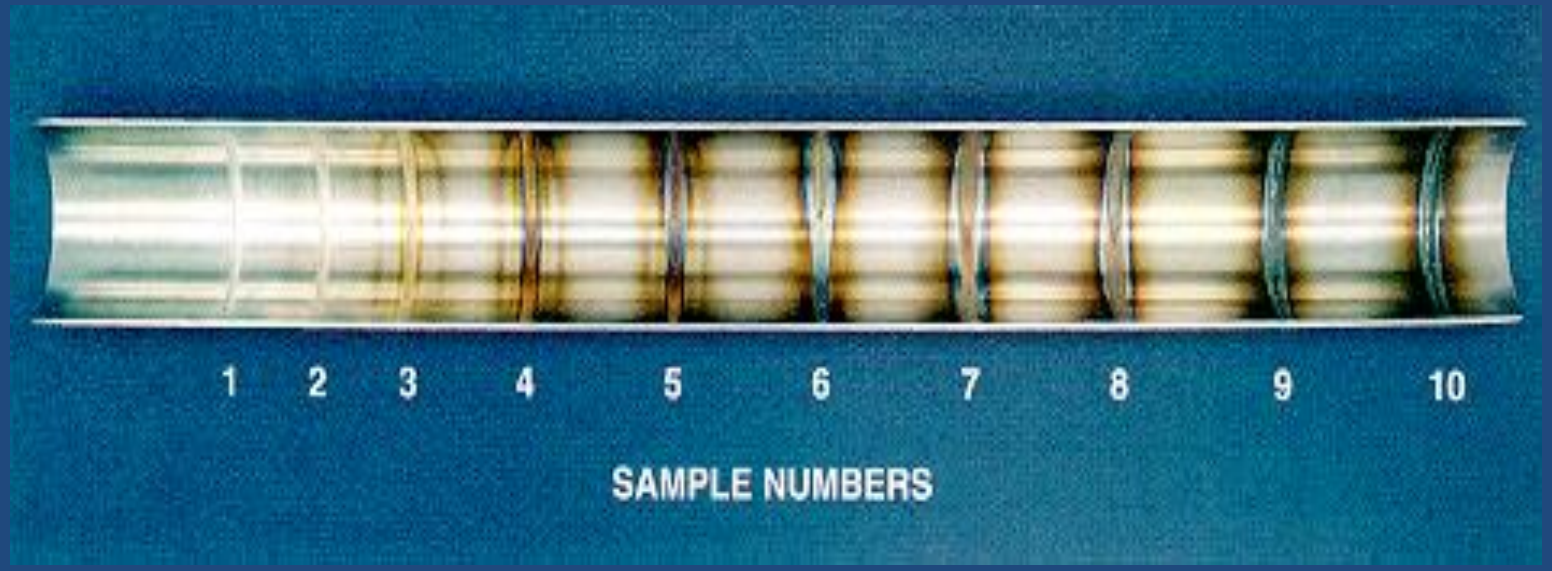
D1.2.1.2 Plastics, rubber and rubber-like materials, when used as product contact surfaces, shall not impart flavor or odor to the products under repeated use conditions.

Note: D1.2.1.2 does not apply to the 3-A SSI Symbol Authorization program.

Standard Compliance Declaration Statement for Rubber & Plastics

- **US FDA Food Contact Status**
- When used unmodified and processed in accordance with Good Manufacturing Practices (GMP) for food contact applications, this product will comply with the U.S. Food and Drug Administration's food additive regulation Title 21 CFR 177.1520(c) 3.2c. This product may be used to produce articles or components of articles used in contact with food for all food types described in Table 1 and Conditions of Use C-H described in Table 2 of U.S. FDA's regulation 21 CFR §176.170(c). The preceding statement refers to regulatory requirements only, not to the product's physical utility. It is the responsibility of the article producer or food packager to determine that the article is suitable for its environment of intended use.

Heat Tint Levels on the Inside of Welded 316L Stainless Steel Tube

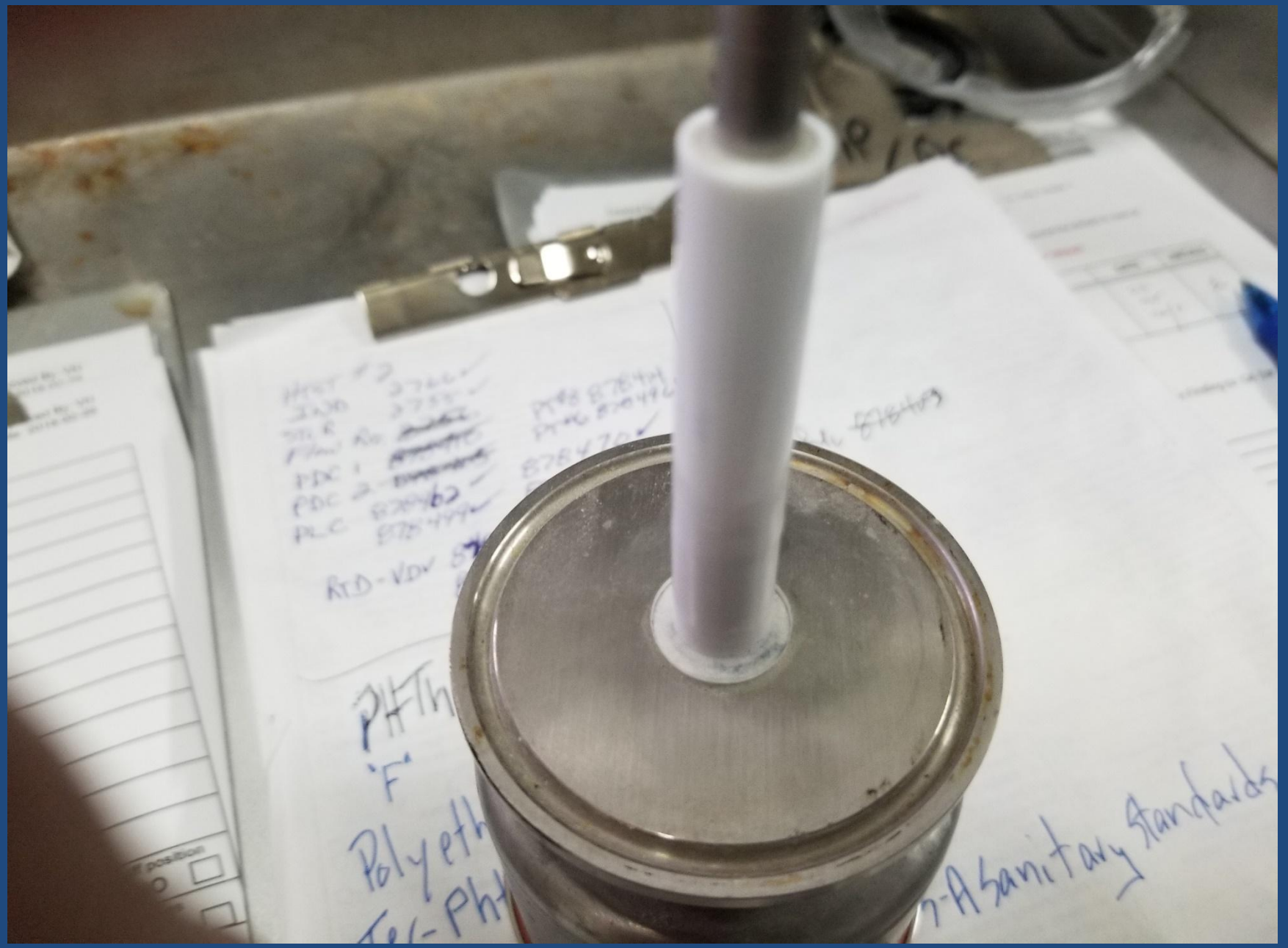


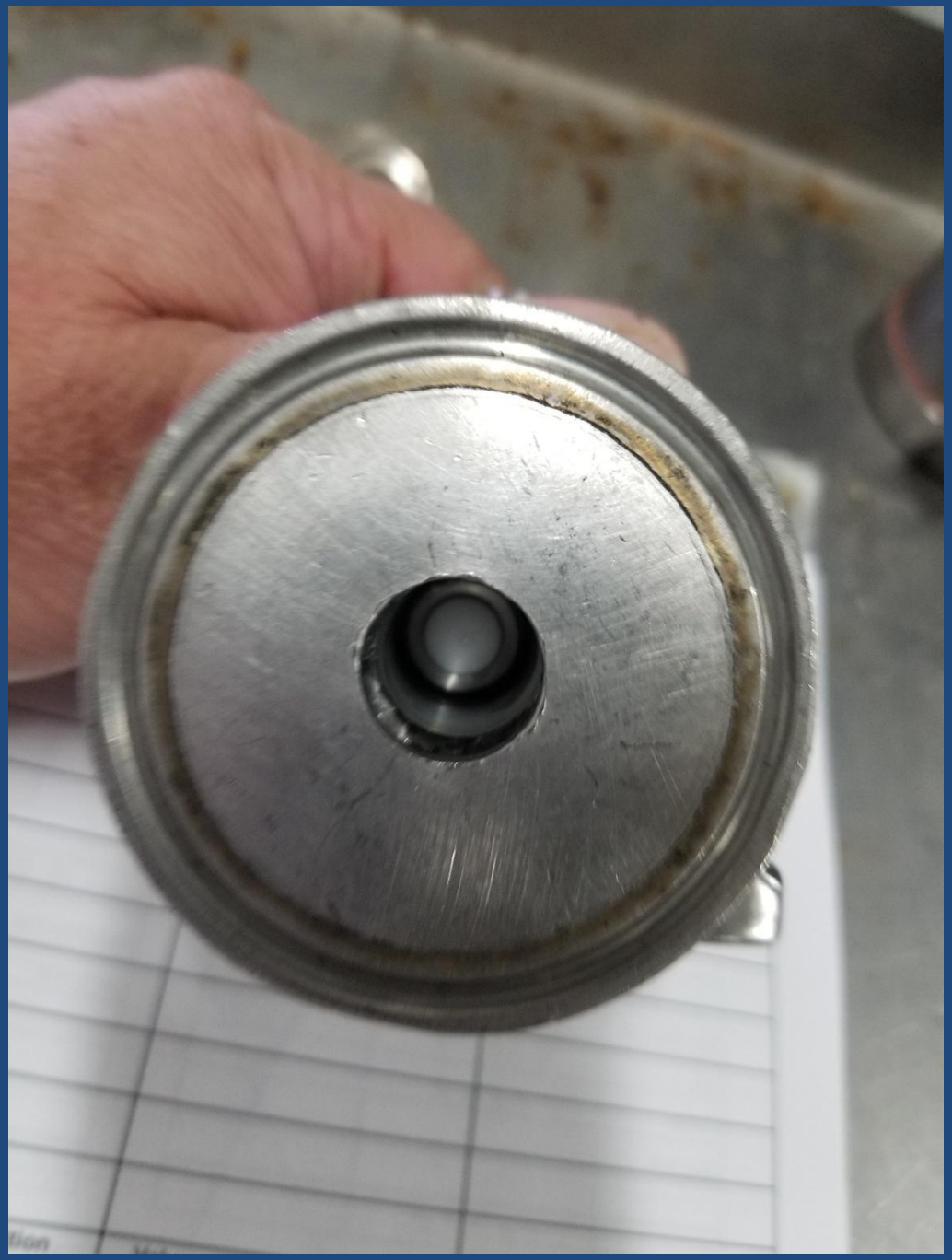
The Sample Numbers refer to the amount of oxygen in the purging gas:

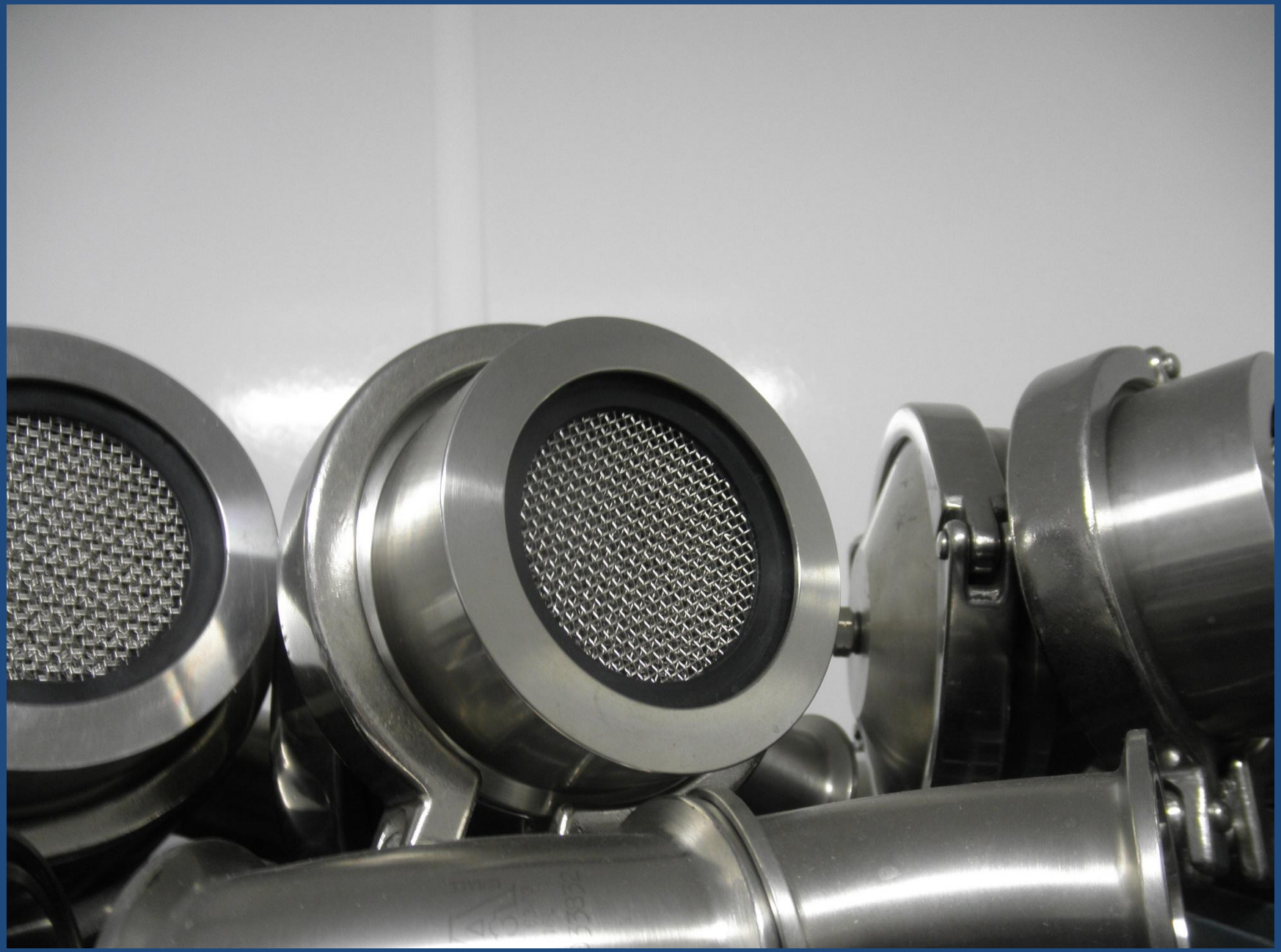
No.1- 10ppm No.2 - 25ppm No.3 - 50ppm
No.4 - 100ppm No.5 - 200ppm No.6 - 500ppm No. 7 - 1000ppm
No.8 - 5000ppm
No.9 -12500ppm No.10 -. 25000ppm


#1
#2
#3
#4


Threads in a product contact area.

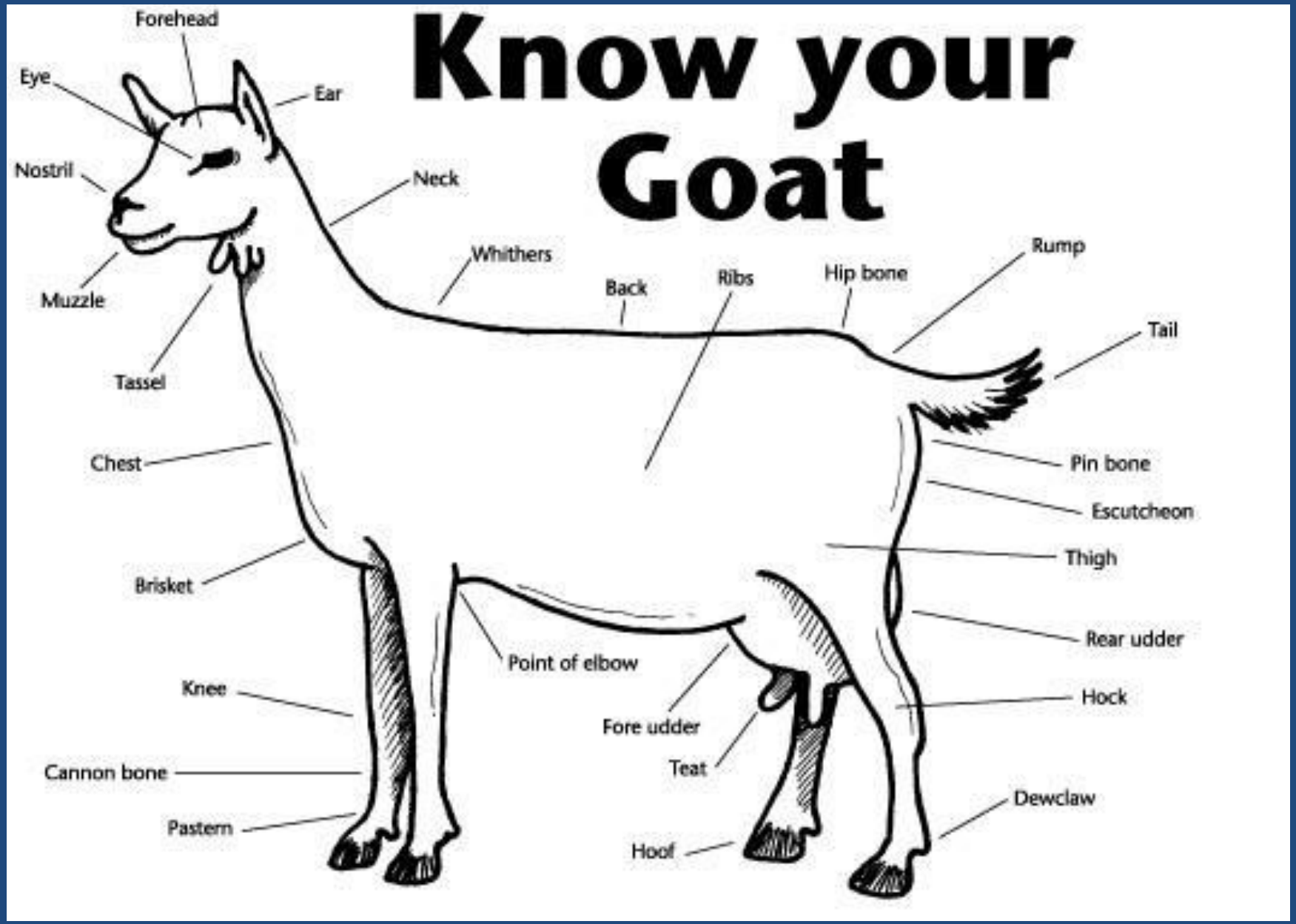

PHTh
'F'
Polyeth
Ter-Pht
3-A Sanitary Standards





The PMO Grade A Inspection Program and 3-A Sanitary Standards have a Global Reach

- The International Certification Program (ICP) began with a demand from the World Trade Organization (WTO) to allow Foreign competitors to have market access in the early 2000's. An ICP Pilot Program began in 2007.
- Prior the Pilot Program, Three States adopted Three Foreign Dairies. Vermont, New York and Florida to provide inspection and certification.
- The ICP became a permanent part of the PMO at the 2015 NCIMS.


Know your Goat
Forehead
Eye
Ear
Nostril
Neck
Whithers
Rump
Back
Ribs
Hip bone
Muzzle
Tail
Tassel
Chest
Pin bone
Escutcheon
Thigh
Brisket
Rear udder
Point of elbow
Knee
Hock
Fore udder
Teat
Cannon bone
Dewclaw
Pastern
Hoof

Dr. Ron Schmidt

Why the rope?

QUESTIONS?

The Carton
Grocery Store Dairy Case

Thank you for your attention.

Upcoming Food Safety Webinars (April – May 2026)

Date	Time (Eastern Time)	Webinar Title
Apr 30	2:00 PM – 3:30 PM	Intro to Gen-FS: An overview of the Genomics for Food and Feed Safety Collaboration
May 4	12:00 PM – 1:00 PM	Clostridium botulinum in Dairy: Risk, Control, and Prevention Strategies – A Live Expert Roundtable
May 20	12:30 PM – 1:30 PM	Neurodivergent Thinking in Food Safety: Implications for Practice, Performance, and Inclusion
May 28	1:00 PM – 2:00 PM	Using Data Trends to Improve Microbial Risk Detection in Food Safety Systems

This webinar is being recorded and will be available for access by **IAFP members** at www.foodprotection.org within one week.

Not a Member? We encourage you to join today.
For more information go to: www.FoodProtection.org/membership/

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JULY 26–29