ThermOmegaTech®

SANITIZATION IN FOOD & BEVERAGE

DEVELOPING A SANITIZATION PROCEDURE FOR YOUR FACILITY THAT CHECKS ALL THE BOXES

Food is central to an individual's long-term health and overall well-being. Authoritative agencies, such as the FDA and USDA, ensure the quality of food available to the everyday consumer and prevent food-borne illnesses. These agencies outline sanitization requirements that each facility must adhere to, or risk being fined.

Rules & Regulations Governing Sanitization

To establish uniform guidelines and protect citizens from unmanaged food and beverage production and packaging standards, the USDA's HACCP regulation, "The Preventive Controls Regulation for Human Food," established the following controls: process, allergen, sanitization, supply chain, and recall.

Section 117.135 (c) 3 addresses explicitly the sanitization control and procedures that must be developed in service of it, as detailed below:

(3) sanitization controls. Sanitization controls include procedures, practices, and processes to ensure that the facility is maintained in a sanitary condition adequate to significantly minimize or prevent hazards such as environmental pathogens, biological hazards due to employee handling, and food allergen hazards. Sanitization controls must include, as appropriate to the facility and the food, procedures, practices, and processes for the:

(i) Cleanliness of food-contact surfaces, including food-contact surfaces of utensils and equipment.

(ii) Prevention of allergen cross-contact and cross-contamination from insanitary objects and from personnel to food, food packaging material, and other food-contact surfaces and from raw product to processed product.

Elements of Cleaning & Sanitizing

In everyday language, the words cleaning, sanitizing, and disinfecting are often used interchangeably. This is not the case in the development of processes.

See the exact definitions, used by the USDA, of each of these words below:

CLEANING: The removal of soil particles from surfaces by mechanical, manual, or chemical methods.

SANITIZING: Treatment of a cleaned surface with a chemical or physical agent to destroy disease/spoilage causing organisms. Reduces the total vegetative cell population to a safe level.

DISINFECTING: Destruction of all vegetative state organisms.

STERILIZING: The complete destruction of all organisms, including spores.

DIRTY: A surface that is not clean.

Establishing A Program

Facilities must develop, document, implement and maintain procedures for cleaning each piece of equipment – from large mixing tubs and floors to smaller, less obvious components on the production line.

Below are three steps to building a comprehensive and effective production line sanitization procedure to ensure compliance with food safety guidelines.

Step 1: Identify Hazards

Hazards must be removed from food production lines to prevent food-borne illnesses or a cross-contaminated product.

Some of the hazards associated with the production of consumables that must be mitigated include but are certainly not limited to:

Food product residue	Transient soil from workers
Liquid contamination	Detergent residues
Airborne contamination	Microorganisms

Methods for identifying contamination risk areas range from a visual inspection to the use of a PH swab or other detection equipment.

Step 2: Evaluate Relevant Regulations

The food processing sector is divided into two broad categories: “meat/poultry,” which is governed primarily by the Food Safety Inspection Service (FSIS) of USDA, and “all other food processors,” which are overseen by the FDA.

While these categories may seem fairly clear cut, it is vital to correctly identify which one your product falls under to adhere to specific guidelines and inspection procedures (for example, the FDA regulates macaroni and noodle products [21 CFR 139]).

However, the USDA regulates any spaghetti sauce with meat in it [9 CFR 319.307]). Regulations also extend to transportation, storage, and products intended for animal consumption.

Guidelines defer between state and federal levels as well, so be sure to perform thorough due diligence when outlining relevant regulations to guide your facility’s production line sanitization procedure.

Step 3: Build a Comprehensive Plan

Determine when, where, and how often to conduct sanitization procedures throughout the facility.

Each production run should always begin with thorough sanitization of all line components and the replacement of any worker-worn protection (such as gloves) to prevent or minimize cross-contamination between products.

Both the frequency and intensity of cleaning may differ based on the products produced in an individual facility, current procedures, and official recommendations. Factors that must be considered when determining the when, where, and frequency are typically remembered by the acronym TACT WINS:

T – Time. The length of time required to properly sanitize a dirty surface can vary depending on the method of cleaning, the type of soil on it, and the type of equipment. Too little time and the surface will not be cleaned. Too much time and chemical agents left on the surface between washes may begin to dry, requiring a restart or additional steps.

A – Action. This refers to the amount of energy needed to clean a surface and does not always mean manual scrubbing – action during cleaning can also refer to the activity of a foam cleaner, the flow through pipes in a CIP system, etc.

C – Concentration. Cleaning agents must be used at the correct concentration when cleaning surfaces – too low of a concentration, and the cleaning agent will not perform as desired.

T – Temperature. Each cleaning agent used has an optimal temperature at which it functions most effectively, especially when used to remove fats.

W – Water. Typically, the first step in most cleaning procedures is to rinse with water, as it is a universal solvent, and it is also used to wash away detergents and solutions used later on. It's important to test a plant's water and account for water hardness when selecting a cleaning compound, as minerals can interact with and impact the performance of agents.

I – Individual. This is who is going to be doing the cleaning. Each person assigned must be properly trained on cleaning procedures and provided with appropriate PPE to perform the cleaning.

N – Nature. What kind of products are produced determines what type of soil is to be removed, with the five basic types typically present in the food industry: fats/grease, proteins, minerals, sugars, and complex carbohydrates, though food allergens are often acknowledged as a common sixth.

S – Surface. This is the material construction of equipment being cleaned. Some metals may develop corrosion over time, although this is unlikely with stainless steel, which is often the material of choice in food processing facilities.

When constructing your individual production line sanitization procedure, reference both official and facility-specific guidelines to ensure compliance with nationally recognized food safety standards.

Step 4: Sanitize Effectively

After determining the when, where, and how often to conduct cleaning procedures, the final question is how to sanitize in an effective and convenient way.

The four main factors to consider when performing sanitization are concentration, temperature, time, and mechanical force applied. The ratios of each factor will vary depending on which cleaning methods listed below are implemented.

Foam: a sanitizing foam is applied to the production line and rinsed off; some manual cleaning may be used for stubborn substances.

Manual: the manual scrubbing of the line and equipment by personnel.

Clean Out of Place (COP): removing equipment and sanitizing it before placing it back in the line.

Clean In Place (CIP): equipment is cleaned without moving it from the production line.

Depending on the facility and production line setup, a combination of the above methods may be used to ensure thorough sanitization.

Selecting A Washdown Station

Sanitization procedures often require washdown equipment to supplement other cleansing methods. Washdown stations, also known as hose stations, can supply a steady flow of high-pressure and high-temperature water that can be used to clean machinery and equipment.

Driven by increasingly stringent cleanliness practices and demand for effective machinery that produces results quickly, washdown stations are often used in industrial production facilities such as dairy, food processing, manufacturing, and pharmaceutical plants.

Steam/Water Washdown Stations

For facilities that have an existing supply of steam – often as a by-product of the production process or a steam heat tracing system – a washdown station that mixes steam and cold water is often the most convenient and cost-effective choice.

These stations typically incorporate a mixing valve that automatically combines steam and water inlet streams to the operator's set temperature. For precise temperature output, it is recommended to implement a thermostatically controlled mixing unit, such as the STVM Washdown Station.

This washdown station operates 100% mechanically and employs a Venturi cartridge-style thermostatic mixing valve which ensures long uninterrupted use, prevents mineral build-up in the station, and minimizes operating noise.

For facilities with tough to clean residue - such as oils and fats - steam-powered washdown stations are an effective supplement to detergents, expediting cleaning with high temperatures and pressurized flow.

Most steam/water mixing stations have built-in safety features designed to prevent accidental steam-only operation and keep employees safe.

The STVM Washdown Station, for example, has interlocking ball valves to prevent live steam from releasing and a high-temperature over-ride, which will reduce flow should temperatures rise above the unit's set-point (150°F/185°F) and will completely shut off flow 15°F above that temperature.

Washdown stations can be an effective cleaning method, so long as the proper tools and procedures are used.

No matter which brand you choose, it is vital to properly train your operators on its use to ensure effective cleansing as part of the overall procedure and supply them with sufficient personal protective equipment that can withstand temperatures in excess of 200°F.

Hot Water/Cold Water Washdown Stations

If steam isn't available, a station that mixes hot and cold water to a specific temperature can be used. These stations may utilize a mixing valve or two individual globe valves to proportionately blend hot and cold-water inlets to produce flow at the user's defined temperature.

These mixing units present a safety risk to the equipment operators if not operated within proper guidelines (150°F water can cause 3rd-degree burns after only two seconds of exposure to the skin), but are can be operated safely with the proper training and protective equipment.

Selecting a station with built-in safety features is recommended to avoid accidental scalding from excessively high temperatures.

The HCX Washdown Station, for example, includes ThermOmegaTech's SmartFlow feature, a thermostatically controlled in-line safety shutoff valve that reduces flow should outlet temperatures exceed the factory set-point and completely shuts off flow 10°F above that with a minimal amount of leakage.

This keeps workers safe and prevents unintended operation of the unit.

Single-Channel Washdown Stations

Other facilities may require a simpler, no-fuss design that provides an easy and reliable source of water – for situations where access to flow is more important than temperature, a single-channel station could be appropriate.

These no-frill stations, such as the HCS washdown station, provide convenient delivery of a single stream of hot or cold water for washdown applications.

Installed into a facility's water supply line, these stations quickly provide a high-powered stream of hot or cold water at the turn of a single ball valve.

Maintenance Considerations

No matter which washdown equipment is selected, considerations should be made for ongoing regular maintenance time and requirements.

Significant differences between stations that can heavily impact downtime include frequency of maintenance, inherent designs that may lessen the frequency, system complexity (how hard it is to get what has to be cleaned or replaced), and whether or not the system is in-line serviceable.

The STVM Washdown Station, as an example, has a mixing valve that utilizes a patented vortex mixing method to significantly reduce mineral build, thus resulting in less frequent maintenance requirements.

The system is also in-line serviceable with only one moving part within the valve cartridge. The cartridge can be replaced in minutes by unscrewing it with a wrench and inserting a replacement. No getting it off the wall, lengthy dismantling, or downtime required.

Choosing a simple but effective system that emphasizes simple maintenance designs will keep your facility running – maximizing uptime and minimizing downtime between runs.

The type of system selected will ultimately depend on the unique facility setup and needs and how the system fits into the sanitization procedure.

Familiarity with federal and local guidelines and a detailed sanitization process design with supplemental and effective washdown stations will keep your facility operating at peak levels for years to come.

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