

## **FOOD PLANT SANITIZATION**

The purpose of implementing a sanitation system using the latest technology is to eliminate any foodborne pathogens on all food contact surfaces

### **Contributing Factors of a Total Sanitation/Food Safety Program**

#### *Type of food contact surface*

The type of material used to make up the food contact surface is of great importance. These surfaces are comprised of many materials including:

\* Stainless Steel

\* Rubber

\* Plastic

Fiberglass

Concrete

Mesh Belts

Soft Metals

\* Wood (in some rare cases)

All materials are either porous, or as in the case of metals such as stainless steel, aluminum and others, when viewed under a microscope, have jagged saw tooth ridges. The metal surface appears to be smooth, but in reality it is a very rough terrain. Organic residues become attached to these areas and provide a good source for the bacteria, and also contribute to becoming a biofilm.

### ***Organic challenge and biofilms***

Soil or organic challenge is food product or residue that does not belong on the contact surface. The most common of soils are proteins, fats, oils, grease, carbohydrates, sugars and mineral deposits such as calcium carbonates, and burned on carbonaceous material from hot oil processing.

For every type of soil there is a different chemistry and method for removal.

Fats, oils and grease require a hydroxide type of chemistry, minerals require an acid product.

Burned on soil requires a boil out technique using a high pH product.

Biofilms are probably the most dangerous of soil loads because they are difficult to detect and are a harborage and food source for bacteria. Any time there is a synthetic material in contact with a bio product, such as food soil, biofilms will occur. Pasteurizers, paddles, and other equipment will support the presence of biofilm. Synthetic conveyor belts also prove to be supportive of biofilm growth.

Proteins are required for the bacteria to adhere to the surface, and as the proteins unfold, they become attached to the surface, and once attached, begin to build until a thin layer is present.

The type of surface is directly related to the biofilm build up. Porous or rough surfaces provide a favorable surface for attachment.

### ***The role of water in cleaning and sanitizing***

Water in itself is very solvent and is a major ingredient in cleaning systems. The chemistry that is used is diluted with water, high pressure systems using water are used in cleaning, and water is a major player in removing soil loads, and bacteria from food contact surfaces.

Fats, oils and greases can be removed at a lower temperature, and do not require such high heat. Steam cleaning is definitely a disadvantage since a 212°F product is cooked on very rapidly. Also, high water temperature will increase in precipitation of minerals left over from processing

the food ingredients and additives, and now calcium carbonate and other minerals will leave a white, chalky deposit. Water is an excellent tool, but if not used properly, can cause more work than anticipated.

***Methods of agitation:*** There are various methods of agitation used to remove organic soils, which include:

- Hand Detailing
- High Pressure - Chemical Agitation
- Steam Cleaning (which has been used, but its disadvantages far outweigh its advantages.)

***Clean in Place (CIP) systems:*** These systems are usually found in dairies, beverage plants, and other processing facilities and allow for cleaning and sanitizing without having to disassemble the equipment. Non-foaming cleaners and sanitizers are used in CIP cleaning. A foaming product can cause cavitation of the pump impellers, and also will reduce the cleaning efficiency of the system.

***COP systems:*** COP is cleaning out of place. This means that equipment is disassembled and placed in a tank which allows the equipment to soak in the cleaning solution. A pump can be installed which will allow the water to agitate the parts, or air can be introduced to cause agitation.