
EXPERIMENT 15 SANITIZATION OF EQUIPMENT IN DAIRY PLANT

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15.1 INTRODUCTION

Sanitization of equipment is an integral and very essential process, which is performed after an effective cleaning operation in a dairy plant. Sanitization is a process of disinfections, which effects the reduction, without adversely affecting the food, by means of hygienically satisfactory chemical agents and /or physical methods, of the number of micro organisms to a level that will not lead to harmful contamination of food. In this way, the microbial load of cleaned surfaces are reduced to a safe range by applying effective sanitizers.

The sanitization has special importance where initial load of microbes accelerates product spoilage during holding and transportation prior to processing. Standard operating procedures (SOPs) for the chemicals are very useful for the plant personnel to avert any unwanted effect on products, equipment and human being.

15.2 OBJECTIVES

- identify various sanitizers and sanitization methods employed in dairy plant.
- learn the sanitizing process of various dairy equipments & containers.

15.3 EXPERIMENT

i. Principle

Sanitizer solution of desired concentration at optimum temperature has ability to kill microorganisms and their application over the cleaned surface results in reduction of microbial load over surface. The ineffectiveness or absence of sanitization increases the microbial load of product causing faster spoilage. Sanitizers of required concentration are applied over the cleaned surface by way of mopping, dipping or passing though the surface of equipment.

The selection of sanitizer / disinfectant will depend on the type of micro organisms to be inactivated, the food being processed and the food contact surface along with quality of water. Live steam is considered to be best disinfectant, which

quickly dries the surface. Other disinfectants generally used are hot water and chemicals like iodophore, chlorine solution etc. The most commonly used sanitizers in dairy industry are chlorine water, hypochlorite, iodophors, quaternary ammonium compounds etc.

ii. Requirement

Plant Equipment: A dairy plant or milk chilling plant

Chemical/material requirement: Soft & clean water, sanitizer

Hypochloride solution: 150-400 PPM available chlorine.

iii. Procedure

- i) Prepare in a clean vessel /vat required sanitizer solution of desired concentration and quantity from the known quality sanitizing material.
- ii) Observe the surface after cleaning. If required re-clean.
- iii) Apply the above solution according to the method to be employed depending upon the size and shape of equipment/vessel to be sanitizer.
 - Milk Cans: If cleaned in the straight through or rotary can washer, these are generally sterilized with live steam or hot air. In manual cleaning or cleaning by can scrubbers, the cans are steamed for sufficient period over the steam block. In the absence of the above facilities, iodophore or chlorine solutions of required concentration are applied after cleaning. Cans are either immersed into the solution or rinsed with small quantity of solution or sprayed over the inside surface. Proper draining of sanitiser solution is ensured.
 - Small size dairy equipment are normally immersed into the sanitizer solution of desired concentration for sufficient time.
 - In the large size or compact type equipments like milk silos/tanks/ ice-cream freezer, milk packing machine, the prepared sanitizer solution is applied by suitable methods like mopping or spraying /passing over the surface.
 - Sterilization of chiller / pasteurizer/evaporator/concentrator/milk line is generally done by circulating hot water at 80 to 85 deg. C for 15-20 minutes.
 - Cold stores are usually disinfected with the bleaching powder.
 - Ensure proper draining of sanitizer solution before using the equipment.

iv. Observations

Observe the followings and record:

Process/Equipment	Sanitizing Method/Sanitizer/	Parameters Conc./Temp/Time
1. Milk reception		
Cans/lid		
Weigh bowl		
Dump vat		
Milk line		
2. Milk pasteurization		
Pasteurizer		
Homogenizer		
Cream separator		

- Tank/Silo
- Milk line
- 3. Milk Product manufacturing
 - Equipment 1
 - Equipment 2
 - Equipment 3
 - Evaporator/dryer
 - Icecream Freezer
 - Other Vessels
- 4. Milk packing
 - Market tank
 - Packing machine
 - Milk lines
 - Other items
- 5. Milk Cold store

v. Results

1. Number of cans cleaned :
2. Quantity of sanitizer used :
3. Concentration of sanitizer solution:
4. Temperature of above solution :
5. Time taken for cleaning :
6. Nos. of cans physically checked:
7. Number of can found deficient in cleaning:
8. Other equipment cleaned :

15.4 PRECAUTIONS

1. Use Standard operating procedure for sanitizers selection and application.
2. Ensure proper cleaning before sanitization.
3. Do not recirculate the sanitizer solution, as it may re-contaminate the surface.
4. Dairy equipment should be, sanitized before and after each use.
5. Complete draining of sanitisers be ensured before use of equipment to prevent affecting product quality.