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COIMBATORE-641 035, TAMIL NADU

DEPARTMENT OF FOOD TECHNOLOGY

19FTE402 &

MEAT, FISH AND POULTRY PROCESS

TECHNOLOGY

UNIT V – HYGIENE AND SANITATION

Topic: Cleaning, Sanitation and Pest Control: Equipment and Facility Design for Meat Industry

Sanitation and hygiene are most important requirement in meat plant operations. Meat product quality, shelf life and consumer acceptability are directly influenced by the sanitary conditions under which the meat is processed and hygienic practices followed in a meat plant. Sanitation can be defined as safeguarding human health through cleanliness. Hygiene is the practice of keeping self and living and working areas clean in order to prevent illness and diseases. Sanitation and hygienic programs have become integral part of meat processing operations. The effective sanitation program in a meat plant would help in achieving the above goals.

a. Cleaning: Physical removal of all visible soil and debris by chemical and or/physical means.

b. Sanitizing: Process used to reduce the number of microorganisms on a surface to safe levels. Sanitizer is a chemical which kills 5 log bacteria on equipment surface or 3 log bacteria on food surface within 30 seconds.

General cleaning and sanitizing procedure

Step 1. Remove all exposed products

Step 2. Dry clean/sweep area

Step 3. Wet area to be cleaned

Step 4. Clean and scrub area

Step 5. Rinse

Step 6. Sanitize

Step 7. Air dry/store properly

Sanitizers

Chlorine based sanitizers: Acts by inhibiting protein synthesis; breakdown nucleic acid; alter the permeability of cell membranes and oxidize the cell surface compounds. Most commonly

used upto 200 ppm, cheap, broad-spectrum antimicrobial, works with any water hardness. However, they are rapidly inactivated in presence of organic matter, pH sensitive (<7 most effective), Temperature sensitive (ideal 21-48º C), short storage stability. May results in formation of carcinogenic chloramines and trihalomethanes. Examples includes Sodium Hypochlorite (liquid); Calcium hypochlorite (powder); Chlorine dioxide (gas); Chloramine-T (powder)

c. Quaternary Ammonium Compounds: They are most suitable for meat Industries. They are synthetic surface-active agents eg. Cationic detergents and act by binding with phospholipid and proteins-permeability change, breaks cell membranes. Their benefits include no taste or odour, more stable in presence of organic compounds, forms bacteriostatic film on the surface after treatment, comparatively cheap and have good storage stability. However, these are very selective (does not kill viruses), require longer contact time and not suitable with hard water.

3. Peroxides: Includes Peracetic Acid/Peroxyacetic acid and Hydrogen Peroxide (Acetic acid+H2O2=PAA). They denature proteins and lipids of microorganisms, oxidizes outer cell membrane of microorganisms. Their benefits include broad-spectrum, rapid inactivation and excellent for low temperature application. However, they are corrosive to skin, special training required for handling, inactivated in presence of high organic matter and not effective against yeast/mold.

4. Ozone: It is formed when O2 molecules collide with oxygen atom (O) to produce O3. Powerful, naturally unstable gas, excellent germicidal activity and more effective than Chlorine/Chlorine dioxide. It is very strong oxidizing, fast reactive and decomposes rapidly without harmful residues. However, it is extremely unstable-must be generated onsite, irritating and toxic, no residual effect, costly with initial capital cost and operational cost. Other sanitizers includes iodine based sanitizers, acid-anionic sanitizers, fatty acid sanitizers

Sanitation and maintenance practices

A cleaning and sanitation programme shall be drawn up and observed and the record thereof shall be properly maintained, which shall indicate specific areas to be cleaned, cleaning frequency and cleaning procedure to be followed, including equipment and materials to be used for cleaning. Equipment used in manufacturing will be cleaned and sterilized at set frequencies. Cleaning chemicals shall be handled and used carefully in accordance with the instructions of the manufacturer.

• Should have adequate potable water supply and free from cross-connections and back-flow

• Proper plumbing with adequate floor drainage and sewage disposal

• Adequate, accessible, sanitary toilet facilities and proper trash and waste disposal facilities

• Convenient hand-washing and sanitizing facilities

• Building shall be kept in good repair to prevent pest access and to eliminate potential breeding sites. Holes, drains and other places where pests are likely to gain access shall be kept in sealed condition or fitted with mesh / grills / claddings or any other suitable means as required and animals, birds and pets shall not be allowed to enter into the food establishment areas/ premises. Treatment with permissible chemical, physical or biological agents, within the appropriate limits, shall be carried out without posing a threat to the safety or suitability of food.

• Fly catcher lights shall not be placed above the meat processing equipments to avoid physical contamination.

• Staff handling exposed or wrapped fresh meat or working in rooms and areas in which such meat is handled, packaged or transported must in particular wear clean and easily cleanable headgear, footwear and light-colored working clothes and, where necessary, clean neck shields or other protective clothing.

• Water facilities should be readily available to wash hands during working days. The temperature of the water must be optimum (Too hot and too cold water is to be avoided). Water must be supplied with a non-hand-operated outlet. This may be controlled by foot, knee or sensor. Bactericidal soap must be available, with disposable paper towels provided.