STRATEGY FOR DEFENSE Against Post-Pasteurization Contamination

The dairy industry has developed an increased awareness of the need to control post-pasteurization contamination. Bacteriological hazards such as Salmonella, Yersinia, Shigella, Listeria, and others have been responsible for recent food borne illness outbreaks from dairy products. These outbreaks have resulted in increased regulatory surveillance, consumer awareness, and tightened internal specifications. To cope with these increased pressures, many dairy processors have developed plans to control the potential for post-pasteurization contamination of pathogenic bacteria.

Any plan designed to reduce the potential for post-pasteurization contamination of pathogenic bacteria must include this three point strategy:

1. Prevent their entry into the processing environment.
2. Control their survival and growth in the processing plant.
3. Prevent post-pasteurization contamination.

Furthermore, implementation of this three-point strategy for defense against post-pasteurization contamination requires identification and control of potential contamination hazards, documentation of control, and continuous surveillance.

Prevention of Entry

While there are several sources, a primary source of food borne pathogens can be raw products (raw milk). Therefore, steps designed to control food borne pathogens entry into the processing plant must include:

- Isolating receiving areas from processing areas.
- Restricting receiving personnel from the processing area.
- Eliminating all crossover connections from raw product to pasteurized products.
- Restricting airflow from the receiving area to the processing areas.
- Utilizing good housekeeping and sanitation in the receiving areas.
- Other measures used in restricting the entry of food borne pathogens into the processing environment.

Control of Survival and Growth

If not controlled, the processing environment can allow food borne pathogens to survive, grow, and, ultimately, contaminate pasteurized products. To help control this potential, the following measures are required:

- Effective pasteurization of all processed dairy products.
- Effective housekeeping and sanitation in the processing environment, including cleaning and sanitizing of walls, ceilings, floors, floor drains, and equipment exteriors.
- Training employees on proper, personal hygiene.
- Routine cleaning and sanitizing of the production environment; particularly those areas where water is allowed to accumulate.
- Other measures to control microbial survival and growth in the plant.

Control of Post-Pasteurization Contamination

The third and most important line of defense against post-pasteurization contamination of food borne pathogens is controlling post-pasteurization contamination. Measures needed to control product contamination are:

- Assure proper product pasteurization.
- Control of engineering defects such as cracked HTST plates, cracked product storage tanks, crossover CIP systems, defective gaskets, corroded equipment, etc.
- Proper cleaning and sanitizing of all product contact surfaces.
- Control of contamination from product packaging.
- Control of air borne and water borne pathogenic bacteria.

The three point strategy for defense against pathogens must be monitored with effective environmental, process, and product testing. While it is not recommended that microbiological analysis for food borne pathogens be conducted on site, laboratory procedures utilizing Coliform Counts, Gram-Negative Bacteria Counts, and Total Plate Counts can be indicators of post-pasteurization contamination. When coliforms and/or other gram-negative bacteria are found in product samples or line samples, action is required to control those sources of contamination.

While the presence of coliforms and other gram-negative bacteria do indicate post-pasteurization contamination, the lack of coliforms does not guarantee that post-pasteurization contamination is not occurring. Therefore, the sensitivity of coliform testing should be improved by collecting larger samples and utilizing preliminary incubation, followed by plating on selective media such as VRB (Stress Coliform Testing). Likewise, testing for gram-negative bacteria (post-pasteurization contaminants) could be conducted in a similar manner, utilizing a gram-negative selective media such as CVT agar.

In summary, defense against post-pasteurization contaminants can be accomplished by preventing their entry into the plant; controlling the survival in the processing environment; and by preventing post-pasteurization contamination. The effectiveness of these defenses must be monitored by continuous microbiological testing of the product, process, and environment. Utilization of "Stress Coliform Testing" procedures and/or other gram-negative testing procedures is helpful in identification of sources of post-pasteurization contamination. ■

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