# **Titre d’article**: Assessing hygiene indicators in two dairies in Algeria in producing pasteurized milk

**Abstract :**

Background and Aim: There is a worldwide controversy about the choice of microbial flora for use as process hygiene indicators. This study aimed to evaluate the pertinence of using either coliforms or Enterobacteriaceae (EB) as process hygiene indicators in the pasteurized milk production line. Two flora families and total flora were used as bacterial indicators in some stages of pasteurized milk production line to identify the origin of post-pasteurization contamination and compare the results obtained for each flora. In addition, the bacteriological profile of isolated coliforms and EB was developed. Materials and Methods: One thousand and two hundred samples of pasteurized cow milk and surfaces (pipes and tank) at various processing stages were taken from two dairies in the northern region of Algeria. The total microbial flora (TF), total coliforms (TC), thermotolerant coliforms, and EB were enumerated, following the recommendations of ISO 4833:2006, ISO 4832:2006, and ISO 21528-2:2017 methods, respectively. The bacteriological profile was determined using the API 20E and 10S tests (bioMérieux, France). Furthermore, the cleaning efficiency and disinfection protocol of surfaces were evaluated using contact agar slides 1 (Liofilchem™, Italy). Results: Enumeration of the different indicators shows that the highest contamination rate is recorded by the total flora in the two units, 3.28 and 3.78 log CFU/mL, respectively. EB (−0.60 log CFU/mL) at post-pasteurization stage in Unit 1 and coliforms (0.44 log CFU/mL) at the pasteurized packaged milk stage in Unit 2 are the least significant germ families. The lowest compliance rates of bacterial contamination were reported for total flora (82-85%) at the three sampled sites in Unit 2. In comparison, the highest was reported in Unit 1 (99.8%) and 2 (98%) by the EB indicator. Assessing the surface cleaning and disinfection protocol compliance shows that the tank records the highest non-compliance rates for EB and TF (4% and 3%) in Unit 2. EB are represented in both units by various species. Acinetobacter baumannii in Unit 1 and Enterobacter cloacae in Unit 2 are the common species of the three indicator families. Acinetobacter and Enterobacter in Unit 1, Escherichia, Citrobacter, Enterobacter, Klebsiella, and Hafnia in Unit 2 are the most time persistent bacterial genera along the production line. Stenotrophomonas, Serratia, Salmonella, Enterobacter, and Escherichia are common genera in both units. Conclusion: The results obtained show no difference in the use of EB or TC as hygiene indicators. However, if the objective is to identify the species of bacterial populations, using EBs are the most appropriate.