



Practical Exercise 12

Study of sterilizer, sterilization of milk and determination of sterilization efficiency

Objective

Study of sterilizer, sterilization of milk and determination of sterilization efficiency

Requirements

Batch sterilizer, milk, reagent (listed in the practical)

Study of batch steriliser and sterilization of milk

- i. Fill milk in crown cork bottles and seal it with crown cork.
- ii. Load the milk bottles into the sterilizer (Fig.12.1).
- iii. Close the lid of the sterilizer tightly.
- iv. Open the steam valve to supply steam to the sterilizer and set the steam control valve such that pressure inside the sterilizer is 15 PSI.
- v. Maintain 15 psi pressure for 20 minutes.



- vi. Open the vent slowly and allow steam to get released.
- vii. Remove the bottles and allow cooling at room temperature.

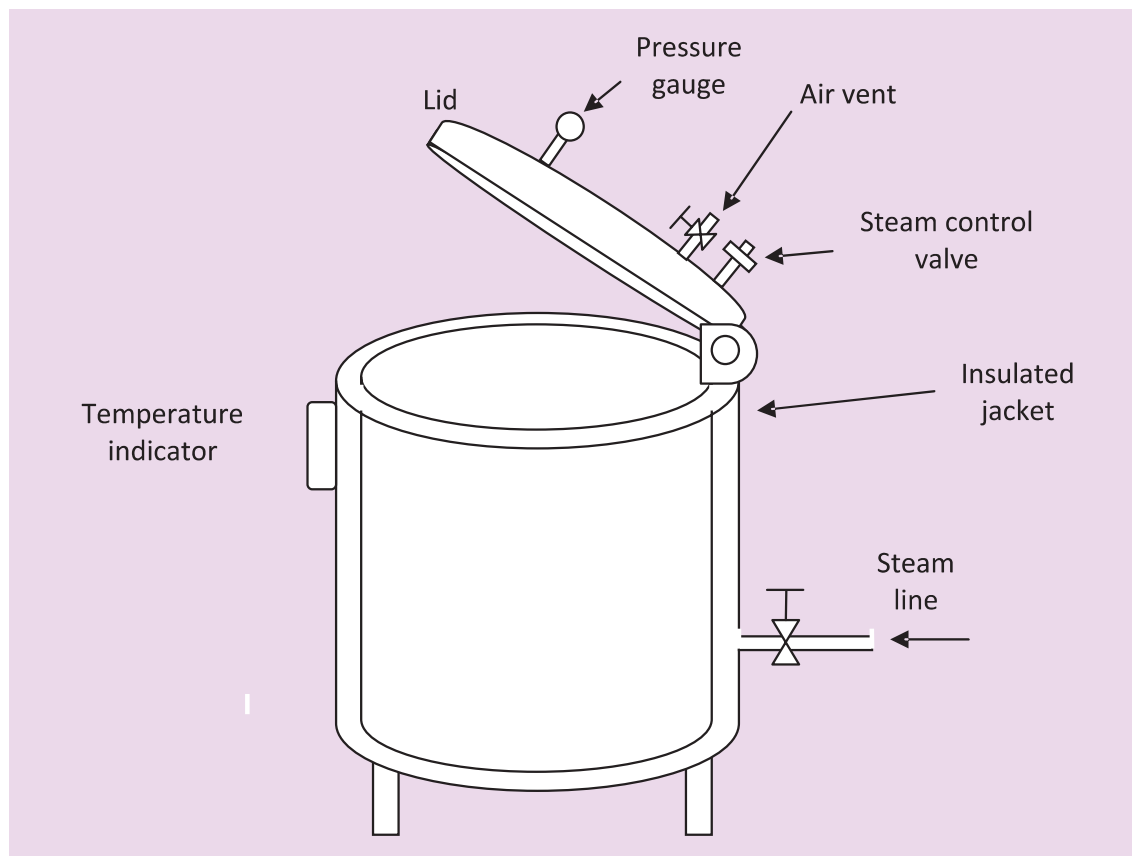


Fig.12.1. Batch sterilizer

Determination of sterilization efficiency by turbidity test

The turbidity test depends upon the denaturation of proteins of milk especially albumin after sterilization. When solutions of inorganic salts or acids are added albumin separates with the casein. The sample after treatment with ammonium sulphate is filtered and heating of the filtrate shows turbidity due to presence of albumin on account of insufficient heat treatment. If milk has been sterilized properly all albumin will have been precipitated and no turbidity will be produced. The test is not suitable for UHT milk.



Materials

- Ammonium sulphate AR
- Conical flask, 50 ml
- Graduated cylinder, 25ml.
- Test tubes 150 /16 mm
- Funnels, 6 cm dia.
- Beaker, 400 ml.
- Whatman No. 12 or equivalent, 12.5 cm folded filter paper
- Pipette, 20 ml

Procedure

Pipette 20 ml of milk in a 50 ml conical flask, add 4.0 ± 0.1 g of ammonium sulphate. Shake the flask till the ammonium sulphate is completely dissolved. Allow the mixture to settle for 5 min, filter through a folded filter paper in a test tube. Keep about 5 ml of the above filtrate in a boiling water bath for 5 min. Cool the tube in a beaker of cold water and examine the contents for turbidity by moving the tube in front of an electric light shaded from the eyes of the observer. The milk is considered sterilized when the filtrate shows no turbidity.

Reference

FSSAI. 2012. Manual of methods of analysis of foods. Milk and milk products. Ministry of Health and Family Welfare, GOI, New Delhi

REVIEW QUESTIONS

1. Describe procedure for milk sterilization by batch method?
2. How will you determine sterilization efficiency?
3. At what pressure and time duration milk bottles should be sterilized?
4. Why it is necessary to determine sterilization efficiency?