

A 10 a - Surface Free Fat of Powder

GEA Niro Method No. A 10 a

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1. Definition

The content of free fat on the surface of milk powder particles is defined as the evaporation residue remaining, after the sample has been gently mixed with petroleum ether, filtered and dried.

2. Scope

The method is to be used for whole milk powder and all other dried dairy products containing fat.

3. Principle

The determination of free fat on the surface of milk powder particles is based on extraction of the fat on the surface of the particles.

4. Apparatus

1. Analytical balance, sensitivity ± 0.1 mg.
2. Balance - sensitivity 10 mg.
3. Funnel.
4. Erlenmeyer flask - 250 ml with ground glass stopper.
5. Pipettes - 25 ml.
6. Measuring cylinder - 50 ml.
7. Shaking apparatus (Stuart flask shakers).
8. Filter paper - Selecta 572 $\frac{1}{2}$ or similar.
9. Erlenmeyer flask, 100 ml.
10. Aluminium weighing dish.
 11. Drying oven without forced air circulation with a thermostatic control capable of maintaining the temperature at $105^{\circ}\text{C} \pm 1^{\circ}\text{C}$.
 12. Desiccator with water-absorbing material, e.g. silica gel.
 13. Stop watch.
 14. 50 ml dispenser.

5. Reagents

Petroleum ether, boiling point <50°C, density 0.645 - 0.665 g/ml

6. Procedure

1. Weigh out 10 g ± 0.01 g of the sample into a 250 ml Erlenmeyer flask.
2. Start the stop watch and add 50.0 ml of petroleum ether to the flask. Petroleum ether is added using a 50 ml dispenser. Check twice that the dispenser measures the correct volume by dispensing 50 ml into a measuring cylinder.
3. Close the flask and agitate in the shaking device. The degree of shaking must be regulated so the powder is moving and the contents are not splashed up on the sides of the upper half of the flask.
4. After exactly 15 minutes, stop the shaking and filter the solution. Two samples are filtered at a time. Collect the filtrate in a 100 ml Erlenmeyer flask. Record the extraction time from the moment the solvent comes in contact with the powder and until filtration begins.
5. As soon as the filtration is finished, pipette 25 ml of the filtrate into the pre-weighed aluminium dish.
6. Allow most of the petroleum ether to evaporate in the fume hood.
7. Dry in the drying oven for one hour at 105°C ± 1°C.
8. The sample is cooled in a desiccator until room temperature and weighed.
9. Measurements are carried out in duplicate.
10. Make a blind analysis for each batch of petroleum ether and correct if necessary.

7. Result

The content of surface free fat may be expressed as a percentage of the powder (or as a percentage of the amount of total fat).

$$\% \text{ free fat} = \frac{a \times 50 \times 100}{\left(ml - \frac{a}{0.94} \right) \times b}$$

ml = ml filtrate taken out with pipette.

a = evaporation residue in g.

b = g of powder used.

0.94 = estimated value of the density of free fat.

Calculate the result to 2 decimal places.

8. Reproducibility

Two determinations must not differ more than 5% relative.

9. Remarks

N/A

10. Literature

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