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A 9 b - Total Fat by Gerber/Teichert

GEA NIRO® Method No. A 9 b

Revised: January 2024

1. Definition

The fat can be separated from fat-containing milk/milk powder through the addition of sulphuric acid. The fat content is read directly on a special calibrated butyrometer after centrifugation.

2. Scope

The method is to be used for fat-containing milk powders.

3. Principle

The fat can be separated from fat-containing milk/milk powder through the addition of sulphuric acid. The separation is made by using amyl alcohol and centrifugation. The fat content is read directly on a special calibrated butyrometer.

4. Apparatus

1. Balance - sensitivity ± 0.01 g
2. Special butyrometer-scale 0-35% or 0-70%, Teichert, '2.5 g lait en poudre' 65°C
3. Caoutchouc stoppers
4. Pipettes - 1 and 10 ml
5. Centrifuge, Funke Gerber - 1200 rpm, equipped with heating element

5. Reagents

1. Sulphuric acid, H_2SO_4 - density 1.816 ±0.003 g/ml 90-91%, clear, colourless.
2. Amylalcohol, $C_5H_{12}O$ - density 0.811 ±0.002 g/ml

6. Procedure

1. Pour successively into the butyrometer:

   10 ml sulphuric acid.

   8 ml distilled water (must not be mixed with the acid).

   Exactly 2.5 g powder.

   1 ml amylalcohol.

2. Close the butyrometer with the caoutchouc stopper and shake until the powder is dissolved. Turn the butyrometer upside-down 5 times.

3. Spin in the centrifuge for 15 minutes at 65°C.

4. Shake for further 5 minutes. Spin in the centrifuge for 15 minutes at 65°C. Adjust the fat column by using the stopper, so that it will be in the graduated part of the butyrometer. The fat percentage can then be read directly after spinning again for further 5 minutes.

5. Measurements are carried out in duplicate.

7. Result

The fat content is read directly on the butyrometer and an average value of the two determinations is calculated. Calculate the result to 1 decimal place.

8. Reproducibility

± 0.3 % for the 0-35 % scale

± 0.5 % for the 0-70 % scale

9. Remarks

1. It is important to wear acid resistant gloves, protection glasses or a protection shield.

2. Samples containing sugar must not be analyzed by this method. Sugar can react very violently with concentrated sulphuric acid and cause an explosion.

3. If the powder is not dissolved after step 5.2, place it in a water bath at $\leq$ 65°C until it is dissolved.

4. If the fat content is >70%, the procedure is repeated using only 1.25 g of powder instead of 2.5 g, and the result is multiplied by 2.

5. For baby food and whole milk, a butyrometer with the scale from 0-35% is used. For powders with a higher fat content, a butyrometer with a scale from 0- 70% is used.

6. If the expected fat content is close to 1%, or if a higher precision of the fat content is required, use the Röse Gottlieb Method A 9 a.

7. The sample must be 65°C when reading the fat percentage. If the centrifuge is not adjusted to the right temperature, the butyrometer must be heated in a water bath.

10. Literature

- GEA Niro Research Laboratory
- IDF Standard 1C:1987.