



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB 5413.36-2010

**National food safety standard - Determination of Trans Fatty
Acids in Foods for Infants and Young Children**

婴幼儿食品和乳品中反式脂肪酸的测定

(English Translation)

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action is required - Full-copy of this standard wil**

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Foreword

Annex A of this Standard is informative.

This Standard was issued for the first time.

National Food Safety Standard - Determination of Trans

Fatty Acids in Foods for Infants and Young Children

1 Application Scope

This Standard specifies the method for the determination of trans fatty acids in foods for infants and young children.

This Standard applies to the determination of trans fatty acids in foods for infants and young children.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition dated applies to this document. For undated references, the latest edition of the referenced documents (including all amendments) applies to this Standard.

3 Principle

The fat in specimens is extracted with solvents. The extract reacts with methyl alcohol under the alkaline condition and generates fatty acid methyl ester; use the gas chromatograph equipped with flame ionization detector to separate cis fatty acid methyl esters and trans fatty acid methyl esters; use the external standard method for quantitation.

4 Reagents and Materials

Unless specified otherwise, all reagents used in this method are analytically pure and the water is grade 1 water specified in GB/T 6682.

4.8 Amylase. unit of activity. 1.5 U/mg, adjust its use level in accordance with the active unit size.

4.10 Potassium hydroxide-methyl alcohol solution (4 mol/L). weigh 26.4 g of potassium hydroxide to dissolve in about 80 mL of methyl alcohol. Cool to room temperature; use methyl alcohol to add dropwise to 100 mL; add about 5 g of anhydrous sodium sulphate (4.9); fully stir before filtering; keep the filtrate.

4.11 Fatty acid methyl ester standard substance. methyloctadecanoate (C18.0), methyl trans-9-octadecenoate (C18.1-9t), methyl cis-9-octadecenoate (C18.1-9c), methyl trans-9.12-octadecadienoate (C18.2-9t, 12t), methyl cis-9.12-octadecadienoate (C18.2-9c, 12c). Place in a refrigerator for storage at - 15°C.

4.12 Trans fatty acid methyl ester standard stock solution. the concentrations are respectively 10.0 mg/mL. Weigh 500 mg (accurate to 0.1 mg) of methyl trans-9-octadecenoate standard substance and methyl trans-9.12-octadecadienoate standard substance; use normal hexane to dissolve and add dropwise to 50.0 mL, respectively. Place in a refrigerator for storage at - 15°C.

4.13 Trans fatty acid methyl ester standard intermediate solution. the concentrations

are 1.0 mg/mL respectively. Absorb 10.0 mL of the two trans fatty acid methyl ester standard stock solutions (4.12) respectively; add them to the same 100-mL volumetric flask and use normal hexane (4.4) to add dropwise to scale. Prepare immediately prior to use. It also works as the maximum concentration of the standard curve.

4.14 Trans fatty acid methyl ester standard working solution. prepare immediately

prior to use. Absorb respectively 0, 2.0, 4.0, 8.0, 10.0 mL of trans fatty acid methyl ester standard intermediate solution (4.13) to pour into a 10-mL volumetric flask; use normal hexane to add dropwise to scale. Then obtain the standard working solutions of concentrations 0, 0.2, 0.4, 0.6, 0.8 and 1.0 mg/mL.

4.15 Fatty acid methyl ester standard mixed solution. use normal hexane to make

fatty acid methyl ester standard substance (4.11) into fatty acid methyl ester standard mixed solution, with the concentrations of each constituent about 0.05 mg/mL ~ 0.5 mg/mL. Use it for the separation degree and qualitative identification of trans fatty acid methyl ester.

5.1 Gas chromatograph, equipped with hydrogen flame ionization detector.

octadecenoic acid methyl esters or trans octadecadienoic acid methyl esters.

6.2.4 Testing of specimen solutions

Inject the specimen test solutions into the gas chromatograph. See Figure A.1 of Annex A for the positions of the peaks of trans fatty acid esters in the specimen test solutions. Measure the peak areas of Area C18.1t and Area C18.2t respectively and search the standard curves to obtain the mass concentrations of trans octadecenoic acid methyl esters or trans octadecadienoic acid methyl esters.

7 Expression of Analytical Result

The concentrations of trans octadecenoic acids or trans octadecadienoic acids in the specimen are expressed by X1 and X2, which are calculated respectively in accordance

with Formula (1).

where,

X(1 or 2)-the concentration of trans octadecenoic acids or trans octadecadienoic acids in the specimen, in mg/100 g;

V-the constant volume of specimen, in mL;

m-the mass of specimen, in g;

ci-the mass concentration of trans octadecenoic acids or trans octadecadienoic acids in the specimen test solution, in mg/mL;

Mai-the molecular weight of trans octadecenoic acids or trans octadecadienoic acids;

Mbi-the molecular weight of trans octadecenoic acid methyl esters or trans octadecadienoic acid methyl esters.

The total concentration of trans fatty acid in the specimen is calculated in accordance with Formula (2).

where,

X-total concentration of trans fatty acids, in mg/100g;

X1-the concentration of trans octadecenoic acids in the specimen, in mg/100 g;

X2-the concentration of trans octadecadienoic acids, in mg/100 g.

(1 or 2)

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