

Vervangt NEN-EN 14333-3:2002 Ontw.

Nederlandse norm

# **NEN-EN 14333-3 (en)**

Non fatty foods - Determination of benzimidazole fungicides carbendazim, thiabendazole and benomyl (as carbendazim) - Part 3. HPLC method with liquid/liquid-partition clean up

ICS 67.050; 67.080.01

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VOORBEELD  
Preview

Normcommissie 370 275 "Voedingsmiddelenanalyse - Horizontale methoden"

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ICS 67.080.01

English version

Non fatty foods - Determination of benzimidazole fungicides  
carbendazim, thiabendazole and benomyl (as carbendazim) -  
Part 3: HPLC method with liquid/liquid-partition clean up

Aliments non gras - Détermination des benzimidazoles  
antifongiques : le carbendazime, le thiabendazole et le  
bénomyl en tant que carbendazime - Partie 3: Méthode  
CLHP avec purification par séparation liquide/liquide

Fettarme Lebensmittel - Bestimmung der Benzimidazol-  
Fungizide Carbendazim, Thiabendazol und Benomyl (als  
Carbendazim) - Teil 3: HPLC-Verfahren mit Reinigung  
durch Flüssig/Flüssig-Verteilung

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## Foreword

This document (EN 14333-3:2004) has been prepared by Technical Committee CEN/TC 275 "Food analysis - Horizontal methods", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2005, and conflicting national standards shall be withdrawn at the latest by April 2005.

EN 14333 consists of the following parts, under the general title *Non fatty foods – Determination of benzimidazole fungicides carbendazim, thiabendazole and benomyl (as carbendazim)*:

- Part 1: HPLC method with solid phase extraction clean up;
- Part 2: HPLC method with gel permeation chromatography clean up;
- Part 3: HPLC method with liquid/liquid-partition clean up.

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## 1 Scope

This document specifies a high performance liquid chromatographic method for the determination of the benzimidazole fungicides carbendazim and thiabendazole in fruits, vegetables and processed products.

When benomyl is present, it is completely degraded to carbendazim and is also determined as carbendazim. Thiophanate-methyl is not determined with the method.

The method has been validated for carbendazim and thiabendazole in an interlaboratory test with homogenates of apples, French beans, mushrooms, lemons and fruit based infant food.

## 2 Principle

The sample is homogenized with ethyl acetate, sodium hydroxide solution and anhydrous sodium sulfate and the homogenate is filtered. An aliquot portion of the ethyl acetate extract is partitioned with hydrochloric acid solution; the aqueous phase is made alkaline and partitioned with ethyl acetate. The organic layer is evaporated and the residue is dissolved in the HPLC mobile phase. Carbendazim and thiabendazole are determined by reversed-phase high performance liquid chromatography (HPLC) with UV or UV and fluorescence detectors.

## 3 Reagents

### 3.1 General

Unless otherwise specified, use reagents of recognized analytical grade, preferably for HPLC and pesticide residue analysis, and only distilled or demineralized water.

### 3.2 Safety aspects associated with reagents

Vapours from some volatile solvents are toxic. Several of these solvents are readily absorbed through skin. Use an effective fume hood to remove vapours of these solvents as they are set free. Carbendazim and thiabendazole are toxic; avoid contact with skin and eyes.

### 3.3 Ethyl acetate

### 3.4 Methanol

### 3.5 Sodium hydroxide solution, mass concentration $\rho$ (NaOH) = 26 g/100 ml

### 3.6 Diluted sodium hydroxide solution, $\rho$ (NaOH) = 2,6 g/100 ml

### 3.7 Sodium sulfate, anhydrous

### 3.8 Hydrochloric acid solution, $\rho$ (HCl) = 0,1 mol/l

### 3.9 Alkaline solution, pH 13,4

Dissolve 33 g of anhydrous sodium acetate, 200 g of sodium chloride and 40 g of sodium hydroxide in 1 l of water.

### 3.10 Phosphate buffer solution, pH 7,2 to 7,5

Dissolve 2 g of dipotassium hydrogen phosphate trihydrate and 0,5 g of potassium dihydrogen phosphate in 1 l of water.

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