EUROPEAN COMMISSION
JOINT RESEARCH CENTRE
Institute for Reference Materials and Measurements

CERTIFIED REFERENCE MATERIAL
BCR® – 431

CERTIFICATE OF ANALYSIS

BRUSSELS SPROUTS POWDER			
Vitamin	Mass fraction (dry matter)		Number of accepted sets of results p
	Certified value[1)]	Uncertainty [2)]	
C (total ascorbate)	4.83 g/kg	0.24 g/kg	7
Niacin	43 mg/kg	3 mg/kg	9

1) This value is the unweighted mean of the means of p accepted sets of results obtained by different sample preparation procedures and analytical techniques. The values are traceable to the International System of Units (SI).
2) The uncertainty is taken as the half-width of the 95 % confidence interval of the mean defined in (1).

This certificate is valid for one year after purchase.

Sales date:

The minimum amount of sample to be used is 2 g vitamin C and 5 g for niacin.

NOTE
This material has been certified by BCR (Community Bureau of Reference, the former reference materials programme of the European Commission). The certificate has been revised under the responsibility of IRMM.

Brussels, March 1997
Revised: February 2007

Signed: 

Prof Dr. Hendrik Emons
Unit for Reference Materials
EC-JRC-IRMM
Retieseweg 111
2440 Geel, Belgium

DESCRIPTION OF THE SAMPLE

BCR-431 is a lyophilised Brussels sprouts powder which is packaged into food-grade, heat-sealed, aluminium laminate sachets. Each sachet contains approximately 20 g of material.

ANALYTICAL METHOD USED FOR CERTIFICATION

- Reverse phase HPLC with fluorometric or ultra-violet detection (vitamin C)
- Fluorometric (after derivatization with o-phenylenediamine) (vitamin C)
- Microbiological assay using *Lactobacillus Plantarum* (ATCC 8014) (niacin)
- Chemical determination using König reaction (niacin)

A detailed description of the employed methods can be found in the certification report.

PARTICIPANTS

- F. Hoffmann La Roche Ltd., Basel, Switzerland (CH)
- IGB Keuringsdienst van Waren, Maastricht (NL)
- Institute of Food Research, Norwich (GB)
- Institut fur Chemie und Biologie (BFE), Stuttgart (DE)
- Institut fur Wirkstoffprufung, Kiel (DE)
- Laboratory of the Government Chemist, Teddington (GB)
- National Food Administration, Uppsala (SE)
- National Food Agency of Denmark, Soborg (DK)
- Schweizerishes Vitaminstitut, Basel (CH)
- TNO Nutrition & Food Research Institute, Zeist (NL)
- Unilever Research Colworth Laboratory, Bedford (GB)
- VTT Biotechnology and Food Research, Espoo (FI)

SAFETY INFORMATION

The usual laboratory safety measures apply.

INSTRUCTIONS FOR USE

The material is intended to be used for calibration and for performance verification of an analytical method.

1. Samples should be allowed to equilibrate to room temperature before opening. Contents should be used on the day of opening only.
2. Before removing a sample for analysis, the material in the sachet should be thoroughly mixed. The recommended sample sizes are 2 g for vitamin C and 5 g niacin.
3. Methods employed for the determination of vitamin C should measure total ascorbate [ascorbic acid (AA) + dehydroascorbic acids (DHAA)]. As DHAA is non-UV absorbing, it must first be reduced to AA using, for example, homocystein or dithioreitol, prior to determination by reverse phase HPLC with UV detection. Alternatively, AA can be oxidised to DHAA using, for example, charcoal, followed by either pre-column or post-column derivatisation with o-phenylenediamine to produce a fluorescent derivative.
4. Methods employed for the determination of naicin are based on extraction using acid digestion and autoclaving followed by microbiological assay with Lactobacillus plantarum (ATCC 8014). Organism growth is measured either at 575-600 nm using a spectrometer, or by lactic acid titration using 0.1 N NaOH solution. As an alternative, chemical procedures can also be used for niacin but these can be more variable. 1. Upon arrival each sachet should be stored unopened, and at temperatures not exceeding - 30 °C. Sachets should be allowed to equilibrate to room temperature before opening. Contents should be used on the day of opening only.
5. The dry matter correction must be made on a separate sub-sample of the content of the same sachet which is taken for vitamin analysis and should be made in parallel to the vitamin analysis. The dry matter correction is determined after drying at atmospheric pressure in a well-ventilated oven at 103 ºC ± 2 ºC for 2 hours. The temperature should be uniform throughout the oven. The loss of matter is expressed as a percentage by matter of the sample.
6. The stated uncertainty applies when the reference material is used for calibration, or for verifying the validity of a calibration curve. When it is used to assess the performance of an analytical technique, the user may refer to the recommendations in the chapter "Instructions for Use" of the certification report.

STORAGE

The cans should be kept unopened in at temperatures not exceeding - 30 ºC. However, the European Commission cannot be held responsible for changes that happen during storage of the material at the customer's premises, especially of opened samples.

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NOTE

A technical report on the production of BCR-431 is available on the internet (http://www.irmm.jrc.be). A paper copy can be obtained from IRMM on request.

European Commission – Joint Research Centre
Institute for Reference Materials and Measurements (IRMM)
Retieseweg 111, B - 2440 Geel (Belgium)
Telephone: +32-(0)14-571.722 - Telefax: +32-(0)14-590.406