



CERTIFIED REFERENCE MATERIAL BCR[®] – 191

CERTIFICATE OF ANALYSIS

LYOPHILISED BROWN BREAD				
Elements	Mass fraction (based on dry mass)		Number of accepted sets of results p	
	Certified value ¹⁾	Uncertainty ²⁾		
Cd	28.4 µg/kg	1.4 µg/kg	12	
Pb	187 µg/kg	14 µg/kg	12	
Cu	2.63 mg/kg	0.07 mg/kg	8	
Zn	19.5 mg/kg	0.5 mg/kg	13	
Fe	40.7 mg/kg	2.3 mg/kg	12	
Mn	20.3 mg/kg	0.7 mg/kg	11	
<p>1) Unweighted mean of the means of p accepted sets of results, each set being obtained in a different laboratory and/or with a different method of determination. The certified values are traceable to the SI.</p> <p>2) The uncertainty is taken as the half-width of the 95 % confidence interval of the mean value defined in 1).</p>				

This certificate is valid for one year after purchase.

Sales date:

The minimum amount of sample to be used is 200 mg.

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, December 1986

Last revision: May 2015

Signed: _____

Prof. Dr. Hendrik Emons
European Commission
Joint Research Centre
Institute for Reference Materials and Measurements
Retieseweg 111
B-2440 Geel, Belgium

Additional Material Information		
Elements	Mass fraction ¹⁾ (based on dry mass)	Number of accepted sets of results p
Ca	0.41 g/kg	3
Cl	16.5 g/kg	2
Hg	2 µg/kg	4
Mg	0.5 g/kg	3
Na	10 g/kg	4
Ni	0.44 mg/kg	3
P	2.1 µg/kg	2
K	3.1 g/kg	4
Se	25 µg/kg	8
1) Unweighted mean of the means of p accepted sets of results, each set being obtained in a different laboratory and/or with a different method of determination. The values are traceable to the SI.		

DESCRIPTION OF THE SAMPLE

The material is a powder of lyophilised brown bread consisting of particles having passed through a 125 µm sieve. It is provided in brown glass bottles with screw caps in units of approximately 25 g.

ANALYTICAL METHOD USED FOR CERTIFICATION

A wide range of sample pre-treatment techniques was applied, including wet digestions with nitric, perchloric or sulphuric acid at atmospheric pressure boiling temperatures or in pressurised bomb, and programmed dry ashing. Methods of final determination were:

Neutron activation analysis (Zn, Mn, Fe)

Cold vapour, flame or graphite furnace atomic absorption spectrometry (Cd, Pb, Cu, Zn, Fe, Mn)

Plasma atomic emission spectrometry (Cu, Zn, Fe, Mn)

Voltammetric techniques (Pb, Cd, Cu)

Isotope dilution mass spectrometry (Pb, Cd, Cu, Zn)

Absorption spectrometry in solutions (Fe)

PARTICIPANTS

- Agricultural Institute, Wexford (IE)
- Animal and Grassland Research Institute, Maidenhead (GB)
- Bundesforschungsanstalt für Getreide- und Kartoffelverarbeitung, Detmold (DE)
- CNRS, Service Central d'Analyse, Vernaison (FR)
- CRN, Centro di Radiochimica, Pavia (IT)
- Energie Centrum Nederland (ECN), Petten (NL)
- Gesellschaft für Strahlen- und Umweltforschung, Neuherberg (DE)
- Greater Manchester Council, Public Analyst's Laboratory, Manchester (GB)
- Kernforschungsanlage Jülich, Jülich (DE)
- Laboratory of the Government Chemist, London (GB)
- Institut d'Hygiène et d'Epidémiologie, Brussels (BE)
- Institut für Spektrochemie und Angewandte Spektroskopie, Dortmund (DE)
- Max-von-Pettenkofer-Institut des Bundesgesundheitsamtes (BGA), Berlin (DE)
- Plasmon Dietetici Alimentari SPA, Milan (IT)
- Rijksinstituut voor Volksgezondheid en Milieuhygiene (RIVM), Bilthoven (NL)
- Rijks-Kwaliteitsinstituut voor Land- en Tuinbouwprodukten (RIKILT), Wageningen (NL)
- Rijksuniversiteit Gent, Gent (BE)
- Risø National Laboratory, Roskilde (DK)
- Universitaire Instellingen Antwerpen, Antwerpen (BE)
- Universität Regensburg, Institut für Chemie, Regensburg (DE)
- Vrije Universiteit Brussel, Brussels (BE)

SAFETY INFORMATION

The usual laboratory safety precautions apply.

INSTRUCTIONS FOR USE

The material is intended to be used

- a) for calibration purposes
- b) to check the performance of a method

The portion for analysis should be taken after mixing the contents of the bottle. The moisture content is to be determined by drying another portion of the sample at 103 ± 2 °C until constant mass is reached as described in the certification report (see Chapter 11.2, instructions for use).

The contents of the bottle should be thoroughly mixed before each test portion is taken. All care must be taken to avoid contamination during opening of the bottle and handling of the material.

STORAGE

The material should be stored in the dark at 18 °C.

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-191 is available on the internet (<http://www.irmm.jrc.be>). A paper copy can be obtained from IRMM on request.