

Certificate of the Reference Material

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Name of the Material : Elements in Sea Bass
Material Code : UME CRM 1209
Issue Date : 12.02.2021
Revision Date : 29.12.2025 (Revision history can be found on the last page)
Validity Period of the Certificate : 12 months from the sales date
Certified Values :

Element	Mass Fraction ^[1,3] , mg/kg	Uncertainty ^[2,3] , mg/kg
Cu	1.20	0.09
Fe	18.6	2.3
Hg	0.715	0.060
Se	1.00	0.14
Zn	17.9	1.6

- [1] Certified values have been assigned by using ID-ICP-MS method.
[2] The expanded uncertainty of certified value includes characterization, homogeneity, stability components and is stated as the standard uncertainty multiplied by the coverage factor $k = 2$, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with GUM "Guide to the Expression of Uncertainty in Measurement".
[3] The certified values and the uncertainties are traceable to the International System of Units (SI). Certified values are corrected for dry mass as described in the section "Instructions for use".

TÜBİTAK UME has been accredited by TÜRKAK as a reference material producer under the accreditation number AB-0001-RM in accordance with the TS EN ISO 17034:2018 standard.

Turkish Accreditation Agency (TÜRKAK) is a signatory to the European Cooperation for Accreditation (EA) Multilateral Agreement (MLA) and the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the recognition of reference material certificates.

Sales Date


Assoc. Prof. Mustafa ÇETİNTAŞ
Director

The following pages are an integral part of the certificate. The use of current certificate is customers' responsibility.

Most recent certificate can be downloaded from www.ume.tubitak.gov.tr.

Informative Values

Element	Mass Fraction ^[3] , g/kg	Uncertainty ^[3,4] , g/kg
As ^[1]	0.0017	0.0003
Ca ^[2]	0.67	0.05
K ^[2]	13.1	1.1
Mg ^[2]	0.91	0.08
Na ^[2]	2.35	0.17
P ^[2]	6.55	0.76

- [1] The value has been assigned from homogeneity, short term and long term stability measurements performed in three different days by HR-ICP-MS method using matrix matched external calibration technique.
- [2] The value has been assigned from homogeneity, short term and long term stability measurements performed in three different days by ICP-OES method using matrix matched external calibration technique.
- [3] The informative values and the uncertainties are traceable to the International System of Units (SI). Assigned values are corrected for dry mass as described in the section "Instructions for use".
- [4] The expanded uncertainty of the informative value has been composed of homogeneity, stability and measurement uncertainty, and is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2$, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with GUM "Guide to the Expression of Uncertainty in Measurement".

Description

The material is lyophilized and ground sea bass tissue in amber glass bottle packaging. Each bottle contains 10 g of fish tissue. Additional information can be found in the certification report.

Intended Use

This material is intended to be used for method validation of the determination of elements mass fractions in fish tissue and for quality control purposes.

Instructions for Use

The bottle should be kept in the laboratory environment to equilibrate with room temperature and should be shaken slowly in three dimensions before opening the cap to re-homogenize the content.

The homogeneity of the material has been proved according to the homogeneity tests performed with a sample of approximately 0.75 g.

Moisture content of the material should be determined by drying approximately 0.5 g of sample at (102 ± 2) °C temperature and atmospheric pressure for six hours. It is recommended to perform the moisture content determination of the material simultaneously with each measurement.

Storage Conditions

This material should be stored at (-20 ± 2) °C in a dark environment.

TÜBİTAK UME cannot be held responsible for changes that might happen to the material at customer's premises due to noncompliance with the instructions for use, and the storage conditions described in the certificate.

Safety Information

The usual laboratory safety measures apply as in the case of similar materials. It is highly recommended that the material must be handled and disposed according to the safety guidelines where applicable.

Participants

Information about the laboratory participated in the characterization study is presented in the table below.

Laboratory	Address
TÜBİTAK UME	TÜBİTAK Gebze Yerleşkesi, Barış Mahallesi, Dr. Zeki Acar Caddesi No.1, 41470 Gebze - Kocaeli / Turkey

Methods and/or Techniques Used for the Determination of the Certified Values

Methods and techniques used in the characterization study is presented below.

Method/Technique	Parameter
Isotope Dilution Inductively Coupled Plasma Mass Spectrometry (ID-ICP-MS)	Cu, Fe, Hg, Se, Zn

Revision History

Date	Remarks
12.02.2021	First Issue
11.10.2021	Certificate is updated due to changes in the format of certificate for reference materials.
29.12.2025	Certificate is updated due to corporate identity (logo) change of TÜBİTAK UME.