National Research Council Canada
Conseil national de recherches Canada

Ottawa, Canada
K1A 0R6

Division of Chemistry
Division de chimie

Marine Analytical Chemistry Standards Program
Programme de standards de chimie analytique marine

December, 1986

DORM-1 **DOLT-1**

DOGFISH MUSCLE AND LIVER REFERENCE MATERIALS FOR TRACE METALS

The following two tables give those elements for which certified values have been established. Certified values are based on results of determinations by at least two independent methods of analysis. The uncertainties represent 95 percent tolerance limits for an individual sub-sample of 250 mg or greater.

Trace Elements - mg/kg

	DORM-1	DOLT-1
Arsenic (d,g,h,n,v)*	17.7 ± 2.1	10.1 ± 1.4
Cadmium (d,g,p)	0.086 ± 0.012	4.18 ± 0.28
Cobalt (d,g,n)	0.049 ± 0.014	0.157 ± 0.037
Chromium (d,g,n,p)	3.60 ± 0.40	0.40 ± 0.07
Copper (d,g,i,n,p)	5.22 ± 0.33	20.8 ± 1.2
Iron (d,f,i,n)	63.6 ± 5.3	712 ± 48
Lead (d,g,p)	0.40 ± 0.12	1.36 ± 0.29
Manganese (d,g,n)	1.32 ± 0.26	8.72 ± 0.53
Mercury (c,n,p)	0.798 ± .074	0.225 ± 0.037
Nickel (d,g,i,n)	1.20 ± 0.30	0.26 ± 0.06
Selenium (g,h,n,v)	1.62 ± 0.12	7.34 ± 0.42
Zinc (d,f,g,i,n,p)	21.3 ± 1.0	92.5 ± 2.3

Minor Elements - percent

Chlorine (n,t)*	1.13 ± 0.03	0.688 ± 0.022
Magnesium (d,f,i,n)	0.121 ± 0.013	0.110 ± 0.015
Potassium (f,i,n)	1.59 ± 0.10	1.01 ± 0.10
Sodium (d,f,i,n)	0.800 ± 0.060	0.726 ± 0.073

*See next page for key to coding.

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Coding

The coding refers only to the ultimate method of analyte determination. No mention is made here regarding the various methods of sample preparation, decomposition and possible analyte separation prior to determination within each coded method.

c - Cold vapour atomic absorption spectrometry.
d - Inductively coupled plasma mass spectrometry.
f - Flame atomic absorption spectrometry.
g - Graphite furnace atomic absorption spectrometry.
h - Hydride generation atomic absorption spectrometry.
i - Inductively coupled plasma atomic emission spectrometry.
n - Instrumental neutron activation analysis.
p - Isotope dilution inductively coupled plasma mass spectrometry.
t - Titrimetry.
v - Vapour phase chromatography.

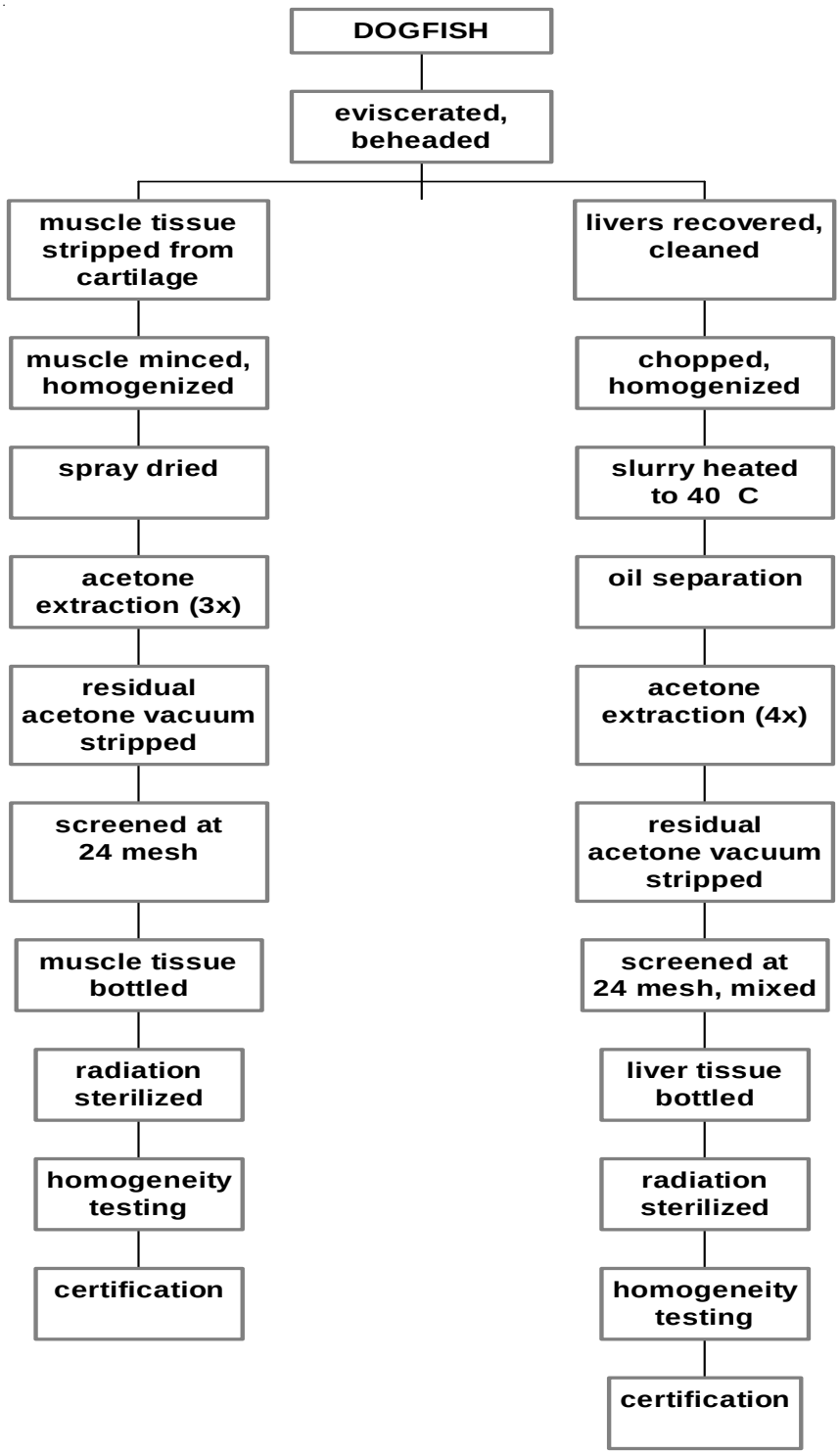
This reference material is primarily intended for use in the calibration of procedures and the development of methods used for the analysis of marine animals and materials with a similar matrix.

The material should be kept tightly closed in the original bottle and should be stored in a cool location, away from any intense radiation sources such as ultraviolet lamps and sunlight.

The bottle should be well mixed by rotation and shaking prior to use, and tightly closed immediately thereafter. A teflon ball is included with each sample. It should be inserted into the bottle the first time it is opened. This aids in mixing the material which may tend to cake on prolonged standing.

Preparation of Materials

These reference materials were processed at the Canadian Institute for Fisheries Technology, Technical University of Nova Scotia, Halifax. The preparation scheme is described in the accompanying schematic drawing.



Instructions for drying

DORM-I and DOLT-2 can be dried to constant weight by:

(1) drying at reduced pressure (e.g. 50 mm Hg) at room temperature in a vacuum desiccator over magnesium perchlorate for 24 hours.

(2) vacuum drying (about 0.5 mm Hg) at room temperature for 24 hours.

Both these methods were used to obtain a conversion factor to produce the "dry weight" results listed on the first page.

Homogeneity

The materials were tested for homogeneity at the Department of Chemistry, University of Alberta. Also, randomly selected bottles were used for the analytical determinations by the NRC laboratory and the collaborating laboratories.

Results from different bottles indicated no significant differences compared to results from sub-samples within bottles. It is assumed, then, that all bottles of these materials have essentially the same composition.

The homogeneity is warranted for samples of 250 mg weight and above for the elements listed the first page.

It is anticipated that as more data becomes available the established values may be updated and reliable values assigned to more elements. Updates will be sent to all users of this reference material.

Feedback and comments from users are encouraged.

Acknowledgements

This material was prepared following the advice of the NRCC Committee on Marine Analytical Chemistry (M. Waldichuk, Chairman). The guidance of the members of the Committee is much appreciated.

These members of staff of the Analytical Chemistry Section, Division of Chemistry, National Research Council of Canada, participated in the analyses: D. Beauchemin, S. Berman, V.J. Boyko, V.P. Clancy, J.W. McLaren, M.R. Miedema, A. Mykytiuk, P. Semeniuk, W.K.M. Siu, R. Sturgeon and S. Willie.

The cooperation of the following in the preparation and analysis of these materials is gratefully acknowledged:

E.G. Bligh and C.H. Hotton, Canadian Institute of Fisheries Technology, Technical University of Nova Scotia, Halifax, Nova Scotia.

D. Boomer, Laboratory Services and Applied Research Branch, Ministry of the Environment, Toronto, Ontario.

B. Kratochvil, Department of Chemistry, University of Alberta, Edmonton, Alberta.
S. Landsberger, Nuclear Reactor, McMaster University, Hamilton, Ontario.

B. McLeod, J. Pirie, I. Davies and G. Topping, Marine Laboratory, Department of Agriculture and Fisheries for Scotland, Aberdeen, Scotland.

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