

List of Certified Reference Materials (CRM)

No	Matrix	Elements	Organisation	Link
1	ERM-BB184 BOVINE MUSCLE (trace elements)	As, Cd, Cu, Fe, Mn, Se, Zn	European Commission – Joint Research Centre European Reference Materials	https://crm.jrc.ec.europa.eu/en/crms/ERM-BB184
2	ERM-BB185 BOVINE LIVER	As, Cd, Cu, Mn, Pb, Se, Zn	European Commission – Joint Research Centre European Reference Materials	https://crm.jrc.ec.europa.eu/en/crms/ERM-BB185
3	ERM-BB186 PIG KIDNEY	Cd, Cu, Fe, Mn, Pb, Se, Zn Indicative Values: As, Hg Information: Ca, Cl, K, Mg, Na	European Commission – Joint Research Centre European Reference Materials	https://crm.jrc.ec.europa.eu/en/crms/ERM-BB186
4	ERM-BB422 FISH MUSCLE	As, Cd, Cu, Fe, Hg, I, Mn, Se, Zn	European Commission – Joint Research Centre European Reference Materials	https://crm.jrc.ec.europa.eu/en/crms/ERM-BB422
5	ERM-BD150 SKIMMED MILK POWDER	Ca, Cl, K, Mg, Na, P, Cd, Cu, Fe, Hg, I, Mn, Pb, Se, Zn	European Commission – Joint Research Centre European Reference Materials	https://crm.jrc.ec.europa.eu/en/crms/ERM-BD150
6	ERM-BD151 SKIMMED MILK POWDER	Ca, Cl, K, Mg, Na, P, Cd, Cu, Fe, Hg, I, Mn, Pb, Se, Zn	European Commission – Joint Research Centre European Reference Materials	https://crm.jrc.ec.europa.eu/en/crms/ERM-BD151

7	ERM-BC211 RICE	Total Arsenic, Dimethylarsinic acid, The sum of arsenite and arsenate	European Commission – Joint Research Centre European Reference Materials	https://crm.jrc.ec.europa.eu/en/crms/ERM-BC211
8	ERM-BD512 DARK CHOCOLATE	Cd, Cu, Mn, Ni	European Commission – Joint Research Centre European Reference Materials	https://crm.jrc.ec.europa.eu/en/crms/ERM-BD512
9	ERM-CD200 SEAWEED (bladderwrack) (trace elements)	Arsenic (As), Cadmium (Cd), Copper (Cu), Mercury (Hg), Lead (Pb), Selenium (Se), Zinc (Zn)	European Commission – Joint Research Centre European Reference Materials	https://crm.jrc.ec.europa.eu/en/crms/ERM-CD200
10	ERM-CE101 TROUT MUSCLE	Hg, As, Fe, Mn, Se, Zn	European Commission – Joint Research Centre European Reference Materials	https://crm.jrc.ec.europa.eu/en/crms/ERM-CE101
11	ERM-CE278k MUSSEL TISSUE	As, Cd, Cr, Cu, Fe, Hg, Mn, Ni, Pb, Rb, Se, Sr, Zn Indicative Values: Ag Information: Co, Ca, Cl, K, Mg, Na	European Commission – Joint Research Centre European Reference Materials	https://crm.jrc.ec.europa.eu/en/crms/ERM-CE278k
12	ERM-CD281 RYE GRASS	Arsenic (As), Boron (B) Cadmium (Cd), Chromium (Cr), Copper (Cu), Mercury (Hg), Manganese (Mn), Molybdenum (Mo), Nickel (Ni), Lead (Pb), Antimony	European Commission – Joint Research Centre European Reference Materials	https://crm.jrc.ec.europa.eu/en/crms/ERM-CD281

		(Sb), Selenium (Se), Tin (Sn), Zinc (Zn)		
13	BCR-191 BROWN BREAD	Cadmium (Cd), Lead (Pb), Copper (Cu), Zinc (Zn), Iron (Fe), Manganese (Mn)	European Commission – Joint Research Centre Institute for Reference Materials and Measurements (IRMM)	https://crm.jrc.ec.europa.eu/en/crms/BCR-191
14	BCR® – 679 White Cabbage	Cadmium (Cd), Copper (Cu), Iron (Fe), Manganese (Mn), Molybdenum (Mo), Nickel (Ni), Strontium (Sr), Zinc (Zn), Mercury (Hg), Antimony (Sb), Thallium (Tl)	European Commission – Joint Research Centre Institute for Reference Materials and Measurements (IRMM)	https://crm.jrc.ec.europa.eu/en/crms/BCR-679
15	BCR-627 Tuna Fish Tissue	Arsenobetaine, Dimethylarsenic acid, Total Arsenic	European Commission – Joint Research Centre Institute for Reference Materials and Measurements (IRMM)	https://crm.jrc.ec.europa.eu/en/crms/BCR-627
16	ERM-AC626 Arsenobetaine in water	Arsenobetaine	European Commission – Joint Research Centre European Reference Materials	https://crm.jrc.ec.europa.eu/en/crms/ERM-AC626
17	TORT-3 Lobster Hepatopancreas Reference Material for Trace Metals	Arsenic (As), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Copper (Cu), Iron (Fe), Lead (Pb), Manganese (Mn), Mercury (Hg), Molybdenum (Mo), Nickel (Ni), Selenium	National Research Council Canada	https://nrc-digital-repository.canada.ca/eng/view/object/?id=ce56680f-1a1d-4a82-b1cb-74f4e9cbb22e

		(Se), Strontium (Sr), Tin (Sn), Vanadium (V), Zinc (Zn), Arsenobetaine (as As), Methylmercury (as Hg)		
18	DOLT-5: Dogfish liver	Arsenic (As), Cadmium (Cd), Calcium (Ca), Cobalt (Co), Copper (Cu), Iron (Fe), Lead (Pb), Magnesium (Mg), Mercury (Hg), Molybdenum (Mo), Potassium (K), Selenium (Se), Silver (Ag), Sodium (Na), Strontium (Sr), Tin (Sn), Vanadium (V), Zinc (Zn), Arsenobetaine (as As), Aluminium (Al), Nickel (Ni), Chromium (Cr), Methylmercury (as Hg), Manganese, Antimony (Sb), Phosphorus (P), Uranium (U)	National Research Council Canada	https://nrc-digital-repository.canada.ca/eng/view/object/?id=78bfab6b-21cf-4733-a871-cac430f711f5
19	DORM-4 Fish Protein	Arsenic (As), Cadmium (Cd), Calcium (Ca), Chromium (Cr), Copper (Cu), Iron (Fe), Lead (Pb), Magnesium (Mg), Manganese (Mn), Mercury (Hg), Nickel (Ni), Potassium (K), Selenium (Se), Silver	National Research Council Canada	https://nrc-digital-repository.canada.ca/eng/view/object/?id=4b507ca7-2404-4137-9184-68a93051a3f0

		(Ag), Strontium (Sr), Vanadium (V) , Zinc (Zn), Arsenobetaine (as As), Methylmercury (as Hg),Aluminium (Al), Sodium (Na), Tin (Sn), Cobalt (Co), Lithium (Li), Molybdenum(Mo), Phosphorus (P), Uranium (U)		
20	PRON-1 River prawn	As, Arsenobetaine, Pb Reference values: Cd, Ca, Cu, Mg, Hg, K, Se, Na, Sr, Zn	National Research Council Canada	https://nrc-digital-repository.canada.ca/eng/view/object/?id=86ed094d-3f24-429f-a683-e603e7b8a4aa
21	SQID-1 Cuttlefish	As, Cd, Hg, Pb, arsenobetaine Reference values: Ca, Cu, Mg, P, K, Na, Sr, U, Zn, methymercury Information values: Sb, Cr, Co, Fe, Mn, Mo, Se, Ag, Sn, dimethylarsenic, arsenic (III), arsenic (V)	National Research Council Canada	https://nrc-digital-repository.canada.ca/eng/view/object/?id=7c6abb25-fa54-4b44-a91c-947f2dc86fe8
22	SRM 1547 Peach Leaves	Aluminum (Al), Arsenic (As), Boron (B), Barium (Ba), Cadmium (Cd), Calcium (Ca), Chlorine (Cl), Copper (Cu), Iron (Fe), Manganese	National Institute of Standards & Technology	https://shop.nist.gov/ccrz__ProductDetails?sku=1547

		(Mg), Manganese (Mn), Mercury (Hg), Molybdenum (Mo), Nickel (Ni), Nitrogen (Total, N), Phosphorus (P), Potassium (K), Rubidium (Rb), Selenium (Se), Sodium (Na), Strontium (Sr), Vanadium (V), Zinc (Zn),		
23	SRM 1549a Whole Milk Powder	Barium (Ba), Calcium (Ca), Magnesium (Mg), Manganese (Mn), Phosphorus (P), Potassium (K), Selenium (Se), Sodium (Na), Strontium (Sr), Zinc (Zn), Copper (Cu), Iodine (I), Iron (Fe), Molybdenum (Mo), Nickel (Ni)	National Institute of Standards & Technology	https://shop.nist.gov/ccrz__ProductDetails?sku=1549A
24	SRM 1570 a Trace Elements in Spinach Leaves	Calcium (Ca), Phosphorus (P), Potassium (K), Sodium (Na), Aluminum (Al), Arsenic (As), Boron (B), Cadmium (Cd), Cobalt (Co), Copper (Cu), Manganese (Mn), Mercury (Hg), Nickel (Ni), Selenium (Se), Potassium (K), Rubidium (Rb), Selenium (Se), Strontium	National Institute of Standards & Technology	https://shop.nist.gov/ccrz__ProductDetails?sku=1570a

		(Sr), Thorium (Th), Vanadium (V), Zinc (Zn),		
25	SRM 1573 a Tomato Leaves	Aluminum (Al), Antimony (Sb), Arsenic (As), Boron (B), Cadmium (Cd), Calcium (Ca), Chromium (Cr), Cobalt (Co), Copper (Cu), Iron (Fe), Manganese (Mn), Mercury (Hg), Nitrogen (Total, N), Nickel (Ni), Phosphorus (P), Potassium (K), Rubidium (Rb), Selenium (Se), Sodium (Na), Vanadium (V), Zinc (Zn), Barium (Ba), Bromine (Br), Cerium (Ce), Cesium (Cs), Chlorine (Cl), Gadolinium (Gd), Hafnium (Hf), Hydrogen (H), Iodine (I), Lanthanum (La), Magnesium (Mg), Molybdenum (Mo), Nitrogen (N), Samarium (Sm), Scandium (Sc), Silver (Ag), Strontium (Sr), Sulfur (S), Thorium (Th), Uranium (U)	National Institute of Standards & Technology	https://shop.nist.gov/ccrz__ProductDetails?sku=1573a
26	SRM 1575 a	Calcium (Ca), Phosphorus (P), Potassium (K),	National Institute of Standards & Technology	https://shop.nist.gov/ccrz__ProductDetails?sku=1575a

	Pine Needles (<i>Pinus taeda</i>)	Aluminum (Al), Barium (Ba), Cadmium (Cd), Chlorine (Cl), Copper (Cu), Iron (Fe), Mercury (Hg), Rubidium (Rb), Zinc (Zn), Magnesium (Mg), Arsenic (As), Boron (B), Cesium (Cs), Cobalt (Co), Lead (Pb), Manganese (Mn), Nickel (Ni), Scandium (Sc), Selenium (Se), Sodium (Na), Cerium (Ce)		
27	SRM 3254 Green Tea (<i>Camellia sinensis</i>) Extract	Arsenic (As), Cadmium (Cd), Mercury (Hg), Lead (Pb), Aluminum (Al) Copper (Cu), Iron (Fe), Manganese (Mn), Zinc (Zn),	National Institute of Standards & Technology	https://shop.nist.gov/ccrz__ProductDetails?sku=3254
28	SRM 3255 Green Tea (<i>Camellia sinensis</i>) Extract	Arsenic (As), Lead (Pb), Aluminum (Al), Copper (Cu), Iron (Fe), Manganese (Mn), Zinc (Zn),	National Institute of Standards & Technology	https://shop.nist.gov/ccrz__ProductDetails?sku=3255
29	TRM-E-2002 Trace Elements in Drinking Water	Cadmium (Cd), Copper (Cu), Lead (Pb), Zinc (Zn)	National Institute of Metrology (Thailand)	https://rm.nimt.or.th/index.php
30	TRM-E-2003 Mercury in Drinking Water	Mercury (Hg)	National Institute of Metrology (Thailand)	https://rm.nimt.or.th/index.php

30	TRM-F-2002 Trace and Essential Elements in Prawn	Cadmium (Cd) , Copper (Cu), Lead (Pb), Zinc (Zn)	National Institute of Metrology (Thailand)	https://rm.nimt.or.th/index.php
31	TRM-F-2003 Arsenic in White Rice Flour	Total arsenic	National Institute of Metrology (Thailand)	https://rm.nimt.or.th/index.php
32	TRM-F-2001 Element in Glutinous Rice Powder	Cadmium (Cd), Chromium (Cr), Manganese (Mn), Zinc (Zn)	National Institute of Metrology (Thailand)	https://rm.nimt.or.th/index.php
33	NMIJ CRM 7405-a Trace Elements and Arsenic Compounds in Seaweed (<i>Hijiki</i>)	Sodium (Na), Potassium (K), Magnesium (Mg), Calcium (Ca), Strontium (Sr), Phosphorus (P), Aluminum (Al), Arsenic (As), Barium (Ba), Cadmium (Cd), Cobalt (Co), Chromium (Cr), Copper (Cu), Iron (Fe), Manganese (Mn) , Nickel (Ni), Lead (Pb), Zinc (Zn)	National Institute of Advanced Industrial Science and Technology, National Metrology Institute of Japan	https://unit.aist.go.jp/nmij/english/refmate/crm/cert/7405a_en.pdf
34	NMIJ CRM 7403-a Trace Elements, Arsenobetaine and Methylmercury in Swordfish Tissue	Mn, Fe, Cu, Zn, As, Se, Sr, Cd, Hg, Na, Mg, P, K, Ca, Arsenobetaine, Methylmercury	National Institute of Advanced Industrial Science and Technology, National Metrology Institute of Japan	https://unit.aist.go.jp/nmij/english/refmate/crm/cert/7403a_en.pdf
35	NMIJ CRM 7406-a Trace Elements in Squid Powder	P, Mg, Ca, Zn, Cu, Sr, As, Fe, Mn, Cd	National Institute of Advanced Industrial Science and Technology,	https://unit.aist.go.jp/nmij/english/refmate/crm/cert/7406a_en.pdf

			National Metrology Institute of Japan	
36	NMIJ CRM 7501-a Trace Elements in White Rice Flour (Cd Level I)	Mn, Fe, Cu, Zn, Cd, Mo, Na, Mg, K, Ca, P	National Institute of Advanced Industrial Science and Technology, National Metrology Institute of Japan	https://unit.aist.go.jp/nmij/english/refmate/crm/cert/7501a_en.pdf
37	NMIJ CRM 7502-a Trace Elements in White Rice Flour (Cd Level II)	Cr, Mn, Fe, Ni, Cu, Zn, As, Rb, Sr, Mo, Cd, Ba, Pb, Na, Mg, P, K, Ca, Inorganic arsenic compound (arsenite +arsenate), Dimethylarsinic acid	National Institute of Advanced Industrial Science and Technology, National Metrology Institute of Japan	https://unit.aist.go.jp/nmij/english/refmate/crm/cert/7502a_en.pdf
38	NMIJ CRM 7503-b Arsenic Compounds and Trace Elements in White Rice Flour	Inorganic arsenic compound (arsenite +arsenate), Dimethylarsinic acid, Zn, Mn, Cu, Fe, Mo, Cd, As	National Institute of Advanced Industrial Science and Technology, National Metrology Institute of Japan	https://unit.aist.go.jp/nmij/english/refmate/crm/cert/7503a_en.pdf
39	NMIJ CRM 7505-a Trace Elements in Tea Leaf Powder	Ca, K, Mg, P, Al, B, Ba, Cd, Cu, Fe, Li, Mn, Na, Ni, Pb, Rb, Sr, Zn, Co, Ti, V, Cr, Y, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu	National Institute of Advanced Industrial Science and Technology, National Metrology Institute of Japan	https://unit.aist.go.jp/nmij/english/refmate/crm/cert/7505a_en.pdf
40	NMIJ CRM 7511-a Trace Elements in Soybean	Ca, K, Mg, P, Cd, Cu, Fe, Zn	National Institute of Advanced Industrial Science and Technology, National Metrology Institute of Japan	https://unit.aist.go.jp/nmij/english/refmate/crm/cert/7511a_en.pdf

41	NMIJ CRM 7512-a Trace Elements in Milk Powder	Ca, Fe, K, Mg, Na, P, Ba, Cu, Mn, Mo, Rb, Sr, Zn	National Institute of Advanced Industrial Science and Technology, National Metrology Institute of Japan	https://unit.aist.go.jp/nmij/english/refmate/crm/cert/7512a_en.pdf
42	NMIJ CRM 7531-a Cadmium in Brown Rice Flour	Mn, Fe, Cu, Zn, As, Cd	National Institute of Advanced Industrial Science and Technology, National Metrology Institute of Japan	https://unit.aist.go.jp/nmij/english/refmate/crm/cert/7531a_en.pdf
43	NMIJ CRM 7532-a Arsenic Compounds and Trace Elements in Brown Rice Flour	Inorganic arsenic compound (arsenite +arsenate), Dimethylarsinic acid, Mg, Ca, Mn, Fe, Cu, Zn, As, Cd	National Institute of Advanced Industrial Science and Technology, National Metrology Institute of Japan	https://unit.aist.go.jp/nmij/english/refmate/crm/cert/7532a_en.pdf
44	NMIJ CRM 7533-a Arsenic Compounds and Trace Elements in Brown Rice Flour	Inorganic arsenic compound (arsenite +arsenate), Dimethylarsinic acid, Mg, Ca, Mn, Fe, Cu, Zn, As, Cd	National Institute of Advanced Industrial Science and Technology, National Metrology Institute of Japan	https://unit.aist.go.jp/nmij/english/refmate/crm/cert/7533a_en.pdf
45	NMIJ CRM 7202-c Trace Elements in River Water (Elevated Level)	B, Al, Cr, Mn, Fe, Ni, Cu, Zn, As, Se, Rb, Sr, Mo, Cd, Sb, Ba, Pb, Na, Mg, K, Ca	National Institute of Advanced Industrial Science and Technology, National Metrology Institute of Japan	https://unit.aist.go.jp/nmij/english/refmate/crm/cert/7202c_en.pdf
46	NMIJ CRM 7203-a Tap Water for Heavy Metals (Elevated Level)	Al, As, B, Cd, Cr, Cu, Fe, Mn, Mo, Ni, Pb, Rb, Sb, Se, Sr, Zn, Ca, K, Mg, Na	National Institute of Advanced Industrial Science and Technology, National Metrology Institute of Japan	https://unit.aist.go.jp/nmij/english/refmate/crm/cert/7203a_en.pdf

47	GBW07605 Tea	Ag, As, Al, Ba, Cd, Ce, Cu, Be, Fe, La, Bi, Mn, Ca, Na, Ni, Pb, Rb, Sb, Se, Th, Sr, Zn, Dy, Eu, F, Gd, Hf, Br, Co, Ho, Cr, K, Cs, Hg, Sc, Li, Sm, Lu, Ti, Mg, Mo, N, Nd, P, Pr, S, Sr, Tb, V, Y, Yb	National Institute of Metrology, China : National Sharing Platform for Reference Materials	https://www.ncrm.org.cn/Web/OrderingEn/MaterialDetail?autolD=7540
48-51	GBW10115 GBW10116 GBW10117 GBW10118 10 Elements in Milk Powder	Al, Cr, Ni, Cu, As, Se, Cd, I, Hg, Pb	National Institute of Metrology, China : National Sharing Platform for Reference Materials	https://www.ncrm.org.cn/Web/OrderingEn/MaterialDetail?autolD=10015 https://www.ncrm.org.cn/Web/OrderingEn/MaterialDetail?autolD=10016 https://www.ncrm.org.cn/Web/OrderingEn/MaterialDetail?autolD=10017 https://www.ncrm.org.cn/Web/OrderingEn/MaterialDetail?autolD=10018
52-55	GBW10119 GBW10120 GBW10121 GBW10122 Al in Vermicelli	Al	National Institute of Metrology, China : National Sharing Platform for Reference Materials	https://www.ncrm.org.cn/Web/OrderingEn/MaterialDetail?autolD=10019 https://www.ncrm.org.cn/Web/OrderingEn/MaterialDetail?autolD=10020 https://www.ncrm.org.cn/Web/OrderingEn/MaterialDetail?autolD=10021 https://www.ncrm.org.cn/Web/OrderingEn/MaterialDetail?autolD=10022
56	NMIA MX009 Trace Element in Freeze-Dried Prawn Tissue	Hg Information value: As, Ba, Ca, Cd, Co, Cu, Fe, K, Mg, Mn, Na, P, Pb, Se, Zn	Australian Government National Measurement Institute: National Measurement Institute Australia	https://www.industry.gov.au/sites/default/files/nmi/chemical-reference/2023-06/mx009_2020_01.pdf