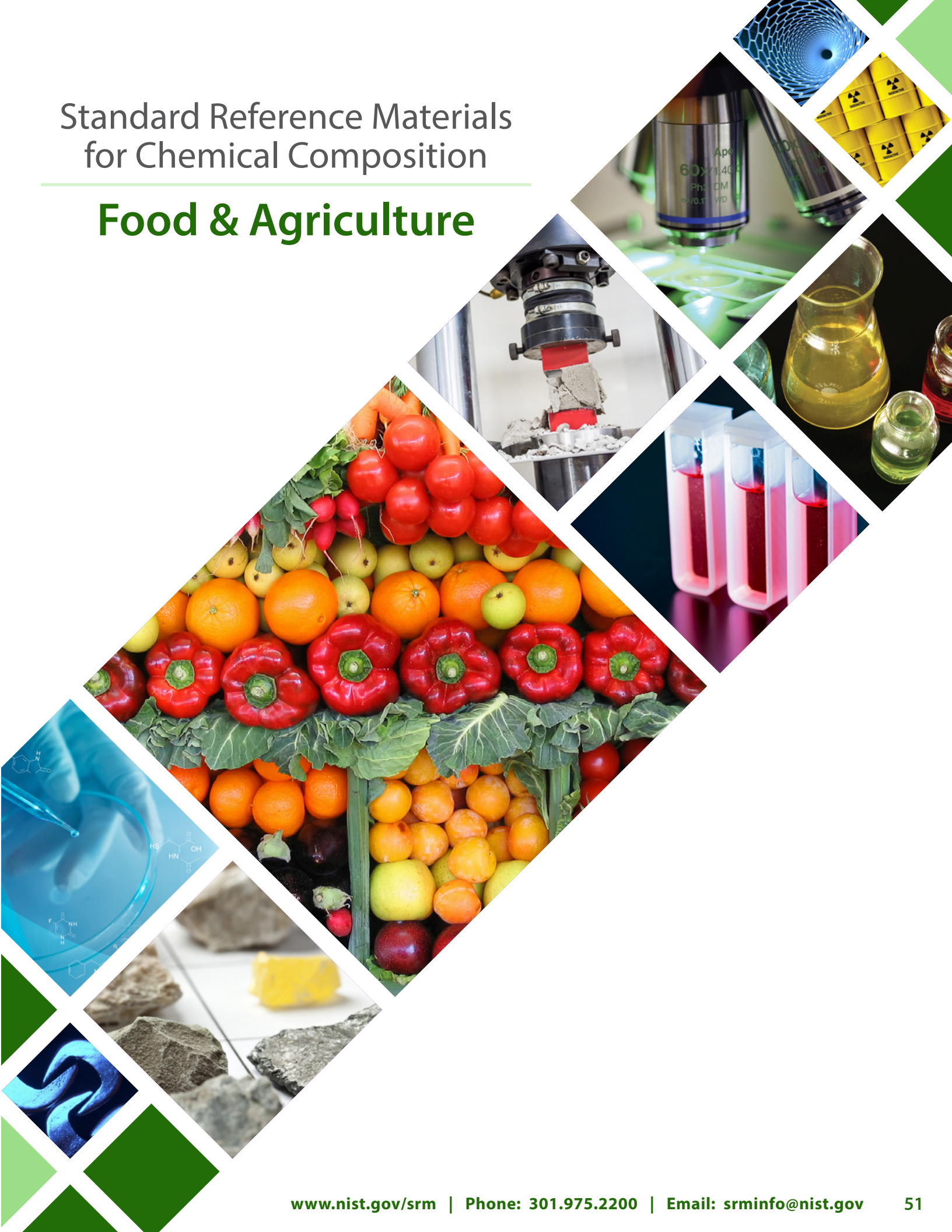
Standard Reference Materials
for Chemical Composition

Food & Agriculture



Foods and Beverages - Macro and Micronutrients

These SRMs are for validation of analytical procedures and calibration of apparatus used in the analysis of trace elements and other analytes in foods and related products.

SRM	Description	Unit of Issue
1546a	Meat Homogenate	4 cans x 85 g
1548b	Typical Diet	2 x 5 g
1549a	Whole Milk Powder	5 pouches x 10 g each
1566b	Oyster Tissue	25 g
1567b	Wheat Flour	50 g
1568b	Rice Flour	50 g
1570a	Trace Elements in Spinach Leaves	60 g
1577c	Bovine Liver	20 g
1845a	Whole Egg Powder	5 pouches x 10 g each
1849a	Infant/Adult Nutritional Formula I (milk-based)	10 pouches x 10 g each
1869	Infant/Adult Nutritional Formula II (milk/whey/soy-based)	10 pouches x 10 g each
1947	Lake Michigan Fish Tissue	5 x 8 grams
2383a	Baby Food Composite	4 x 70 g
2384	Baking Chocolate	5 x 91 g
2385	Slurried Spinach	4 x 70 g
2386	Avocado Powder	5 x 10 g
2387	Peanut Butter	3 x 170 g
3035	Arsenic Species in Apple Juice	5 x 1.5 mL
3233	Fortified Breakfast Cereal	60 g each
3234	Soy Flour	50 g
3235	Soy Milk	10 x 10 mL
3252	Protein Drink Mix	5 pouches x 10 g each
3253	Yerba Mate Leaves	2 x 10 g
3254	Green Tea (*Camellia sinensis*) Leaves	5 x 3 g
3255	Green Tea (*Camellia sinensis*) Extract	5 x 1 g
3281	Cranberry (Fruit)	5 x 6 g
3282	Low-Calorie Cranberry Juice Cocktail	5 x 1.2 mL
3287	Blueberry (Fruit)	5 pouches x 5 g each
3290	Dry Cat Food	5 pouches x 10 g each
3530	Iodized Table Salt (Iodide)	1 bottle x 200 g
8256	Wild-caught Coho Salmon	2 jars, 6 g to 8 g
8257	Aquacultured Coho Salmon	2 jars, 6 g to 8 g
8258	Wild-caught Shrimp	2 jars, 6 g to 8 g
8259	Aquacultured Shrimp	2 jars, 6 g to 8 g
8260	Infant Nutritional Formula (hydrolyzed milk-based)	400 g
8261	Adult Nutritional Formula (high-protein)	400 g

See Table 110.1 on the website for more information.

Foods and Beverages - Other Components of Potential Interest

These SRMs are for validation of analytical procedures and calibration of apparatus used in the analysis of trace elements and other analytes in foods and related products.

SRM	Description	Unit of Issue
1548b	Typical Diet	2 x 5 g
1565	Mycotoxins in Corn	2 x 60 g
1566b	Oyster Tissue	25 g
1849a	Infant/Adult Nutritional Formula I (milk-based)	10 pouches x 10 g each
1869	Infant/Adult Nutritional Formula II (milk/whey/soy-based)	10 pouches x 10 g each
1946	Lake Superior Fish Tissue	5 x 7-9 grams
2386	Avocado Powder	5 x 10 g
2387	Peanut Butter	3 x 170 g
3233	Fortified Breakfast Cereal	60 g each
3234	Soy Flour	50 g
3235	Soy Milk	10 x 10 mL
3253	Yerba Mate Leaves	2 x 10 g
3254	Green Tea (*Camellia sinensis*) Leaves	5 x 3 g
3255	Green Tea (*Camellia sinensis*) Extract	5 x 1 g
3278	Tocopherols in Edible Oils	5 x 1 mL
3281	Cranberry (Fruit)	5 x 6 g
3282	Low-Calorie Cranberry Juice Cocktail	5 x 1.2 mL
3287	Blueberry (Fruit)	5 pouches x 5 g each
8260	Infant Nutritional Formula (hydrolyzed milk-based)	400 g
8261	Adult Nutritional Formula (high-protein)	400 g
8403	Cocoa Flavanol Extract	5 x 2 g

See Table 110.1 on the website for more information.

Wheat Hardness (kernel form)

This RM is intended primarily for calibrating instruments used to determine the hardness of bulk or single kernel wheat. RM 8441a was prepared and analyzed by the Federal Grain Inspection Service program, Grain Inspection Packers and Stockyards Administration of the United States Department of Agriculture.

SRM	Description	Unit of Issue
8441a	Wheat Hardness (kernel form)	set (50)

See Table 110.6 on the website for more information.

Food Contaminants and Allergens

SRM	Description	Unit of Issue
1566b	Oyster Tissue	25 g
1947	Lake Michigan Fish Tissue	5 x 8 g
1953	Organic Contaminants in Non-Fortified Human Milk	5 x 5 mL
1954	Organic Contaminants in Fortified Human Milk	5 x 5 mL
2387	Peanut Butter	3 x 170 g
3256	Green Tea-Containing Solid Oral Dosage Form	5 x 2.5 g
8238	Glyphosphate in Oat Flour (High Level)	100 g
8239	Glyphosphate in Oat Flour (Low Level)	100 g
8404	Almond Flour for Allergen Detection	3 x 170 g
8405	Hazelnut Flour for Allergen Detection	5 x 8 g
8642a	FDA Saxitoxin Dihydrochloride Solution	5 x 1.2 mL

See Table 110.2 on the website for more information.

Agricultural Materials (powder form)

SRM	Description	Unit of Issue
1515	Apple Leaves	50 g
1547	Peach Leaves	50 g
1570a	Trace Elements in Spinach Leaves	60 g
1573a	Tomato Leaves	50 g
1575a	Trace Elements in Pine Needles (*Pinus taeda*)	50 g

See Table 110.4 on the website for more information.

Fertilizers (powder form)

These SRMs are intended for use in the fertilizer industry as working standards.

SRM	Description	Unit of Issue
120c	Phosphate Rock (Florida)	90 g
193	Potassium Nitrate	90 g
194a	Ammonium Dihydrogen Phosphate	90 g
200b	Potassium Dihydrogen Phosphate (Fertilizer Standard)	90 g
694	Phosphate Rock, Western	90 g
695	Trace Elements in Multi-Nutrient Fertilizer	70 g
2429	Flue Gas Desulfurization Gypsum	200 g

See Table 110.5 on the website for more information.

Tobacco-Related Materials

SRM	Description	Unit of Issue
3222	Cigarette Tobacco Filler	20 x 10 g

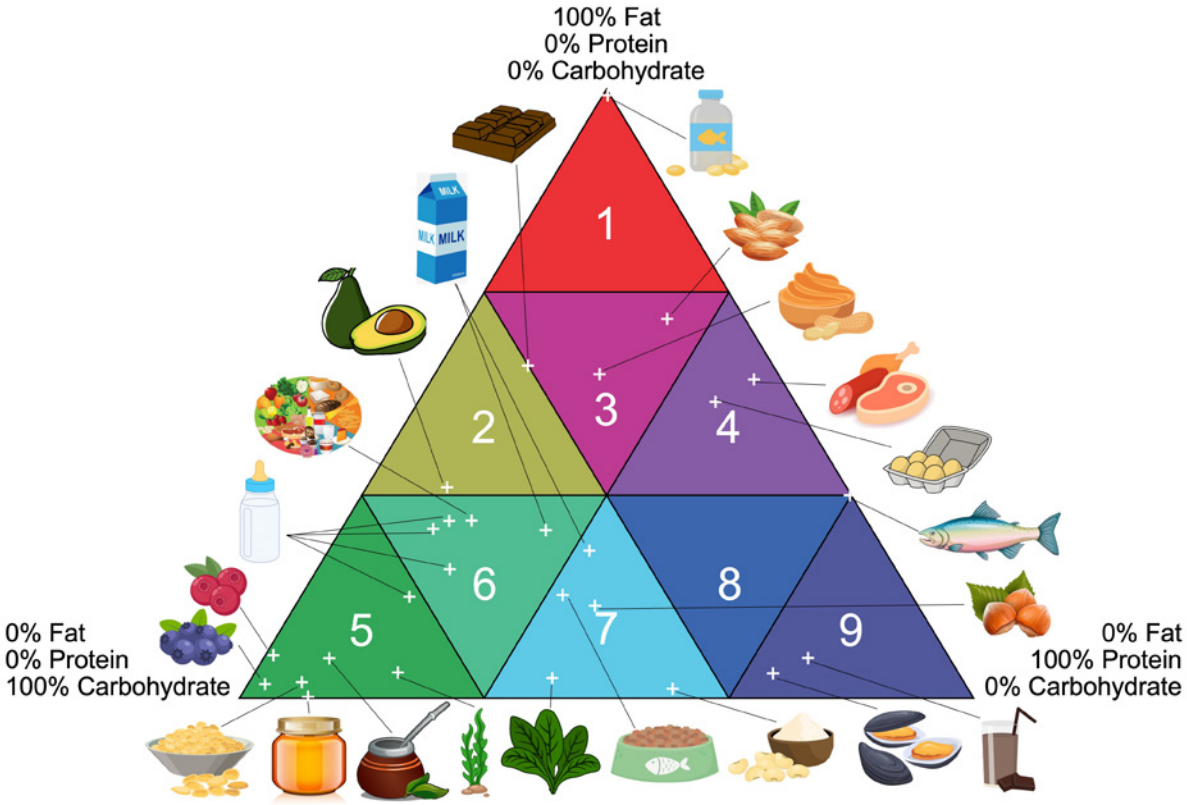
See Table 110.10 on the website for more information.

Dietary Supplement Materials (includes nutraceuticals and herbs)

SRM	Description	Unit of Issue
3232	Kelp Powder (*Thallus laminariae*)	3 x 5 g
3235	Soy Milk	10 x 10 mL
3246	*Ginkgo biloba* (Leaves)	5 x 3 g
3247	*Ginkgo biloba* (Extract)	5 x 1 g
3248	Ginkgo-Containing Tablets	5 x 1 g
3250	Saw Palmetto *(Serenoa repens)* Fruit	5 x 6 g
3251	Saw Palmetto *(Serenoa repens)* Extract	5 x 1 mL
3254	Green Tea (*Camellia sinensis*) Leaves	5 x 3 g
3255	Green Tea (*Camellia sinensis*) Extract	5 x 1 g
3256	Green Tea-Containing Solid Oral Dosage Form	5 x 2.5 g
3262	St. John's Wort (*Hypericum perforatum* L.) Aerial Parts	5 x 3.3 g
3268	Kudzu (*Pueraria montana var. lobata*) Extract	5 x 1 g
3275	Omega-3 and Omega-6 Fatty Acids in Fish Oil	3 ea 2 x 1.2 mL
3279	Chromium Dietary Supplement	5 x 6 g
3281	Cranberry (Fruit)	5 x 6 g
3282	Low-Calorie Cranberry Juice Cocktail	5 x 1.2 mL
3283	Cranberry Extract	5 x 2.5 g
3284	Cranberry-Containing Solid Oral Dosage Form	5 x 2.5 g
3285	Mixed-Berry Containing Solid Oral Dosage Form	5 x 2.5 g
3289	Multivitamin Tablets	30 x 5 bottles
3291	Bilberry Extract	5 x 1 g
3294	Multielement Tablets	30 x 5 bottles
3299	Ground Turmeric (*Curcuma longa* L.) Rhizome	5 x 3 g
3300	Curcumin Extract of Turmeric (*Curcuma longa L.*) Rhizome	5 x 1 g
3384	Ground Asian Ginseng (*Panax ginseng C.A. Meyer*) Rhizome	5 x 3 g
3385	Asian Ginseng (*Panax ginseng*) Extract	5 x 1 g
3389	Ginsenosides Calibration Solutions	5 x 1 mL
3398	Ginger (*Zingiber officinale*) Rhizome	5 x 1.6 g
3530	Iodized Table Salt (*Iodide*)	1 x 200 g
8037	Krill Oil	3 x 4.5 mL
8183	Omega-3 and Omega-6 Fatty Acids in Botanical Oils	4 x 1.2 mL
8186	Soy Protein Isolate	5 x 10 g
8187	Soy Protein Concentrate	5 x 10 g
8188	Soy-Containing Solid Oral Dosage Form	5 x 2.6 g
8650	Ground Kudzu (*Pueraria montana var. lobata*) Rhizome	5 x 3 g
8652	Kudzu-Containing Solid Oral Dosage Form	5 x 2.6 g
8644	Ginseng-Containing Solid Oral Dosage Form	5 x 2.6 g
8666	Ginger (*Zingiber officinale*) Extract	5 x 3 g

See Table 110.9 on the website for more information.

Distribution of SRMs in the AOAC Food Triangle



NIST classifies food-matrix SRMs based on fat, protein, and carbohydrate content using a triangle developed by AOAC INTERNATIONAL[1], based on the supposition that foods (and thus reference materials) within each sector will have similar properties and therefore will pose similar challenges in determination of the same nutrient. Preparation of food-matrix SRMs has been based on the distribution of foods from a typical US diet in the AOAC triangle, with a majority of common foods and SRMs categorized in sectors 5 and 6 (e.g., fruits, vegetables, cereals, and grains). Conversely, only a small fraction of foods and SRMs are categorized in sectors 1 through 4 (higher-fat foods like meats and nuts). Additional materials are also prepared based on suggestions from user communities.

1 SRM 1588c Organics in Fish Oil
SRM 3275 Fatty Acids in Fish Oils

2 SRM 2384 Baking Chocolate
SRM 2386 Avocado Powder

3 SRM 2387 Peanut Butter

4 SRM 1546a Meat Homogenate
SRM 1845a Whole Egg Powder

5 SRM 1568b Rice Flour
SRM 2383a Baby Food Composite
SRM 3233 Fortified Breakfast Cereal
SRM 3287 Blueberries
SRM 1869 Infant/Adult Nutritional Formula

6 SRM 1548b Typical Diet
SRM 1549a Whole Milk Powder
SRM 1849a Infant/Adult Nutritional Formula

7 SRM 1566b Oyster Tissue
SRM 2385 Slurried Spinach
SRM 3234 Soy Flour
SRM 3290 Dry Cat Food

9 SRM 1946 Lake Superior Fish Tissue
SRM 1947 Lake Michigan Fish Tissue
SRM 2974a Mussel Tissue
SRM 3252 Protein Drink Mix

[1] W.R. Wolf, K.W. Andrews (1995) *Fresenius J. Anal Chem* 352:73-76.

Measuring Herbicide Residue in Oat-Based Food Products

Reference Material 8238 and 8239 Glyphosate in Oat Flour

Glyphosate in Oat Flour

The Environmental Protection Agency (EPA) establishes tolerances for pesticide and herbicide residues in food that are still considered safe for consumption. For food manufacturers to test their products a reference material is recommended to ensure their measurements are accurate. Oats are of particular interest as the herbicide, glyphosate, is used as a desiccant to dry out the crop before harvest. This allows for earlier harvests and greater uniformity of crops. Consequently, glyphosate is typically found at higher levels than other herbicides.

The reference materials are oat flour obtained from commercial sources. The level of glyphosate in the RM 8238 (high level) was targeted to represent typical glyphosate levels found in oats from conventional agriculture practices. The level of glyphosate in RM 8239 (low level) was targeted to represent typical glyphosate levels found in oats from organic agriculture practices, yet high enough to detect by current glyphosate analytical methods These materials are intended for harmonizing measurements of glyphosate in grains and similar materials.

A unit of RM 8238 or 8239 consists of one bottle of oat flour. Each bottle contains approximately 100 g of material.

https://www.nist.gov/news-events/news/2023/01/measuring-herbicide-residue-oat-based-food-products