

January 4, 2021



UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-8390

Dear HAMQAP Participant,

The requested samples from the available options for the Health Assessment Measurements Quality Assurance Program (HAMQAP) exercise are enclosed. Please check the contents of the package upon receipt against the enclosed packing slip and complete the online sample receipt confirmation form (<https://tinyurl.com/Ex6Receipt>) within 24 h. Additionally, please look over the reporting website (<https://qa.nist.gov/hamqap>) prior to making any measurements and let us know if you have any questions.

We would like you to use your usual in-house methods of analysis for determination of the analytes in the study samples described below. The following pages of this document provide additional details for each study. Please store all samples appropriately and pay close attention to the minimum sample size requirements to ensure that a representative sample from the material is used for analysis.

Laboratories who are participating in HAMQAP exercises can choose to self-identify on the program website. Although NIST cannot endorse laboratories, this list of HAMQAP participants may be helpful to individuals searching for third party laboratories. If you would like your laboratory's information to be shared on the website, please be sure to check the corresponding box on the *My account* tab. NIST will not share data with outside sources, but you are welcome to use your data from reports to demonstrate performance.

Results are due by **February 12, 2021**. If you have any questions about these projects, you can contact us anytime at hamqap@nist.gov. Thank you for your interest and participation.

Sincerely,

HAMQAP Team

NUTRITIONAL ELEMENTS (Chlorine, Iodine, Chromium, Molybdenum, Selenium)

Nutritional Elements Dietary Intake Samples

Sample Composition

Multivitamin: Three bottles, each containing 30 multivitamin tablets, are provided. Before use, grind all 30 tablets and mix the resulting powder thoroughly. After grinding, the resulting powder can be stored at room temperature (20 °C to 25 °C) and should be analyzed within two days for analytes in this study. A sample size of at least 0.2 g is recommended for the measurement of iodine, chromium, molybdenum, and selenium, while a sample size of at least 0.75 g is recommended for the measurement of chlorine.

Infant Formula A: Three packets, each containing approximately 10 g of powdered infant formula, are provided. Before use, the contents of each packet should be mixed thoroughly. A sample size of at least 0.5 g is recommended.

Sample Storage

Multivitamin: Controlled room temperature, 20 °C to 25 °C, for the original unopened bottles and for the resulting ground powder.

Infant Formula: –20 °C or colder in the original unopened packets.

Sample Reporting

Prepare one sample and report one value from each bottle of multivitamin or packet of infant formula provided, on an as received basis, in units of mg/kg.

TOXIC ELEMENTS (Arsenic, Cadmium, Lead, Mercury)

Toxic Elements Dietary Intake Samples

Sample Composition

Rice Flour: One bottle containing 50 g of rice flour is provided. Before use, the contents of the bottle should be mixed thoroughly. Allow the contents to settle for one minute prior to opening to minimize the loss of fine particles. A sample size of at least 0.5 g is recommended.

Green-Tea Tablets: Three packets, each containing 2.5 g of powdered green tea-containing solid oral dosage form (ground tablets) are provided. Before use, the contents of each packet should be mixed thoroughly. Allow the contents to settle for one minute prior to opening to minimize the loss of fine particles. A sample size of at least 0.5 g is recommended.

Sample Storage

Controlled room temperature, 20 °C to 25 °C, in the original unopened bottles or packets.

Sample Reporting

Prepare three samples and report three values from the single bottle of rice flour provided. Prepare one sample and report one value from each packet of green-tea SODF provided. Report all values on an as received basis, in units of mg/kg.

WATER-SOLUBLE VITAMINS (Biotin, Vitamin C (Ascorbic Acid))

Water-Soluble Vitamins Dietary Intake Samples

Sample Composition

Multivitamin: Three bottles, each containing 30 multivitamin tablets, are provided. Before use, grind all 30 tablets and mix the resulting powder thoroughly. After grinding, the resulting powder can be stored at -20°C or colder and should be analyzed within two days for analytes in this study. A sample size of at least 1.5 g is recommended for determination of biotin, while a sample size of at least 2 g is recommended for determination of vitamin C.

Infant Formula A: Three packets, each containing approximately 10 g of powdered infant formula, are provided. Before use, the contents of each packet should be mixed thoroughly. A sample size of at least 1 g is recommended for determination of biotin, while a sample size of at least 2 g is recommended for determination of vitamin C.

Sample Storage

Multivitamin: Controlled room temperature, 20°C to 25°C , for the original unopened bottles; -20°C or colder for ground tablets.

Infant Formula: -20°C or colder in the original unopened packets.

Sample Reporting

Prepare one sample and report one value from each bottle or packet provided, on an as-received basis, in units of mg/kg.

FAT-SOLUBLE VITAMINS (Vitamins A and E)

Fat-Soluble Vitamins Dietary Intake Samples

Sample Composition

Multivitamin: Three bottles, each containing 30 multivitamin tablets, are provided. Before use, grind all 30 tablets and mix the resulting powder thoroughly. After grinding, the resulting powder can be stored at -20°C or colder and should be analyzed within two days. A sample size of at least 2 g is recommended.

Infant Formula A: Three packets, each containing approximately 10 g of powdered infant formula, are provided. Before use, the contents of each packet should be mixed thoroughly. A sample size of at least 3 g is recommended for determination of vitamin A, while a sample size of at least 2 g is recommended for determination of vitamin E.

Sample Storage

Multivitamin: Controlled room temperature, 20°C to 25°C , for the original unopened bottles; -20°C or colder for ground tablets.

Infant Formula: -20°C or colder in the original unopened packets.

Sample Reporting

Prepare one sample and report one value from each bottle or packet provided, on an as-received basis, in units of mg/kg. Values may be reported as total (sum of all forms measured) or as individual forms (e.g., retinyl acetate, retinyl palmitate, α -tocopheryl acetate).

FATTY ACIDS (OMEGA-3, OMEGA-6)

Fatty Acids Dietary Intake Samples

Sample Composition

Fish Oil: Three ampoules of fish oil, each containing 1.2 mL, are provided. The contents of the ampoule should be mixed thoroughly prior to removal of a test sample for analysis. A sample size of at least 0.5 g is recommended.

Anchovies: One can of anchovies, containing approximately 56 g of material, is provided. The entire contents of the can should be blended, preferably with a handheld homogenizer or immersion blender, prior to sampling. Use a sample size appropriate for your usual in-house method of analysis.

Sardines: One can of sardines, containing approximately 120 g of material, is provided. The entire contents of the can should be blended, preferably with a handheld homogenizer or immersion blender, prior to sampling. Use a sample size appropriate for your usual in-house method of analysis.

Sample Storage

Fish Oil: Under refrigeration, 2 °C to 4 °C, in the original unopened ampoules.

Anchovies and Sardines: Controlled room temperature, 20 °C to 25 °C, in the original unopened cans.

Sample Reporting

Fish Oil: Prepare one sample and report one value from each ampoule provided, on an as-received basis, in units of mg/g, as the free fatty acid.

Anchovies and Sardines: Prepare three samples and report three values from the single jar provide, on an as received basis, in units of mg/g, as the free fatty acid.

Fatty Acids Human Metabolites Samples

Sample Composition

Human Red Blood Cells (RBCs): Three vials each of Human RBCs Samples A and B, each containing 0.6 mL, are provided. Precautions should be taken to avoid exposure of these materials to direct UV light. These materials should be allowed to thaw at room temperature for at least 30 min prior to sampling. After a material is thawed, it should be processed immediately. The contents of each vial should be gently mixed prior to removal of a test portion for analysis. Use a sample size appropriate for your usual in-house method of analysis.

Sample Storage

–70 °C or colder in the original unopened vials.

Sample Reporting

Prepare one sample and report one value from each vial provided in mass fraction for the individual fatty acids and weight percent (%) of total fatty acids.

Additional Sample Notes: These materials are from a human source. Handle products as a biohazardous material capable of transmitting infectious disease. The supplier of the source materials used to prepare this product found the materials to be non-reactive when tested for hepatitis B surface antigen (HBsAg), human immunodeficiency virus (HIV), hepatitis C virus (HCV), and human immunodeficiency virus 1 antigen (HIV-1Ag) by Food and Drug Administration (FDA) licensed tests. However, no known test method can offer complete assurance that hepatitis B virus, hepatitis C virus, HIV, or other infectious agents are absent from this material. Accordingly, this human blood-based product should be handled at the Biosafety Level 2 or higher as recommended for any potentially infectious human serum or blood specimen by the Centers for Disease Control and Prevention (CDC) Office of Safety, Health, and Environment and the National Institutes of Health (NIH).

BOTANICALS (Anthocyanidins)

Botanicals Dietary Intake Samples

Sample Composition

Cranberry: Three packets, each containing 6 g of freeze-dried, powdered cranberry fruit, are provided. Before use, the contents of each packet should be mixed thoroughly. Allow the contents to settle for one minute prior to opening to minimize the loss of fine particles. A sample size of at least 1 g is recommended.

Blueberry: Three packets, each containing 5 g of freeze-dried, powdered blueberry fruit, are provided. Before use, the contents of each packet should be mixed thoroughly. Allow the contents to settle for one minute prior to opening to minimize the loss of fine particles. A sample size of at least 1 g is recommended.

Bilberry: Three packets, each containing 1 g of bilberry extract, are provided. Before use, the contents of each packet should be mixed thoroughly. Allow the contents to settle for one minute prior to opening to minimize the loss of fine particles. A sample size of at least 0.1 g is recommended.

Sample Storage

Controlled room temperature, 20 °C to 25 °C, in the original unopened packets.

Sample Reporting

Prepare one sample and report one value from each packet provided, on an as-received basis, in units of mg/kg. Values may be reported as the sum of all anthocyanidins measured, as calibrated to cyanidin-3-glucoside (C3G), or as individual forms (e.g., cyanidin, delphinidin).

NATURAL PRODUCTS (Caffeine, Theobromine, Theophylline)

Botanicals Dietary Intake Samples

Sample Composition

Protein Powders: One packet of each protein powder A and B, containing approximately 10 g of material, are provided. Before use, the contents of each packet should be mixed thoroughly. Allow the contents to settle for one minute prior to opening to minimize the loss of fine particles. Use a sample size appropriate for your usual in-house method of analysis.

Sample Storage

Controlled room temperature, 20 °C to 25 °C, in the original unopened packets.

Sample Reporting

Prepare three samples and report three values from the single packet provided, on an as-received basis, in units of mg/g.

CONTAMINANTS I (Chlorate, Perchlorate)

Contaminants Dietary Intake Samples

Sample Composition

Infant Formula B: Three packets, each containing approximately 10 g of powdered infant formula, are provided. Before use, the contents of each packet should be mixed thoroughly. Use a sample size appropriate for your usual in-house method of analysis.

Infant Formula C and E: One packet of each material, each containing approximately 100 g of powdered infant formula whey-based raw ingredient, are provided. Before use, the contents of each can should be mixed thoroughly. Use a sample size appropriate for your usual in-house method of analysis.

Infant Formula D: One packet, containing approximately 20 g of powdered infant formula soy-based raw ingredient, is provided. Before use, the contents of the packet should be mixed thoroughly. Use a sample size appropriate for your usual in-house method of analysis.

Infant Formula F and G: One can of each material, each containing approximately 400 g of powdered infant formula, are provided. Before use, the contents of each can should be mixed thoroughly. Use a sample size appropriate for your usual in-house method of analysis.

Sample Storage

Controlled room temperature, 20 °C to 25 °C, in the original unopened packets or cans.

Sample Reporting

Infant Formula B: Prepare one sample and report one value from each packet provided, on an as-received basis, in units of ng/g.

Infant Formula C, D, E, F, and G: Prepare three samples and report three values from each packet or can provided, on an as-received basis, in units of ng/g.

CONTAMINANTS II (Glyphosate, AMPA)

Contaminants Dietary Intake Samples

Sample Composition

Oat Flour A and B: One jar of each Oat Flour A and B, each containing approximately 100 g of material, are provided. Before use, the contents of each jar should be mixed thoroughly. Allow the contents to settle for one minute prior to opening to minimize the loss of fine particles. A sample size of at least 1 g is recommended.

Sample Storage

Controlled room temperature, 20 °C to 25 °C, in the original unopened jars.

Sample Reporting

Prepare three samples and report three values from each jar provided, on an as-received basis, in units of ng/g.

PROXIMATES (Ash, Calories, Carbohydrates, Fat, Protein, Solids)

Proximates Dietary Intake Samples

Sample Composition

Infant Formula A: Three packets, each containing approximately 10 g of powdered infant formula, are provided. Before use, the contents of each packet should be mixed thoroughly. Use a sample size appropriate for your usual in-house method of analysis.

Rice Flour: One bottle containing 50 g of rice flour is provided. Before use, the contents of the bottle should be mixed thoroughly. Allow the contents to settle for one minute prior to opening to minimize the loss of fine particles. Use a sample size appropriate for your usual in-house method of analysis.

Sample Storage

Infant Formula A: $-20\text{ }^{\circ}\text{C}$ or colder in the original unopened packets.

Rice Flour: Controlled room temperature, $20\text{ }^{\circ}\text{C}$ to $25\text{ }^{\circ}\text{C}$, in the original unopened bottle.

Sample Reporting

Infant Formula A: Prepare one sample and report one value from each packet provided, on an as-received basis, in units of percent for ash, carbohydrates, fat, protein, and solids, and in units of kcal/100 g for calories. For protein, use a nitrogen conversion factor of 6.38 as recommended in AOAC Official Method 991.20.

Rice Flour: Prepare three samples and report three values from the single jar provided, on an as-received basis, in units of percent for ash, carbohydrates, fat, protein, and solids, and in units of kcal/100 g for calories. For protein, use a nitrogen conversion factor of 5.95 for the rice flour samples, as recommended by FAO/WHO.