

Reference Material 8261

Adult Nutritional Formula (high protein)

REFERENCE MATERIAL INFORMATION SHEET

Purpose: This reference material (RM) is intended for harmonizing measurements of nutrients in infant formulas, adult nutritionals, or similar materials.

Description: A unit of RM 8261 consists of one can of powdered adult formula. Each can contains approximately 400 g of material.

Non-Certified Values: National Institute of Standards and Technology (NIST) non-certified values are best estimates based on currently available information. However, they do not meet NIST's criteria for certification. Non-certified values should not be used to establish metrological traceability to the International System of Units (SI) or other higher-order reference system [1].

Non-certified values on an as-received basis are provided in Table 1. The non-certified values for elements and vitamins are based on replicate measurements provided by the material manufacturer. These non-certified values are metrologically traceable to the materials and procedures used in their determination.

Table 1. Non-Certified Values for Selected Elements and Vitamins in RM 8261

Measurand	Mass Fraction ^(a,b) (mg/100 g)
Calcium (Ca)	292.5 ± 5.4
Manganese (Mn)	1.267 ± 0.023
Zinc (Zn)	10.59 ± 0.20
Free Vitamin B ₆	1.884 ± 0.039
Vitamin E Acetate	17.49 ± 0.14

^(a) These values are expressed as $x \pm 2u(x)$, where x is the value and $u(x)$ is the standard uncertainty of x . The standard uncertainty combines between-laboratory reproducibility and between-can heterogeneity. While the best estimate of the mass fraction for both measurands lies within the interval $x \pm 2u(x)$, this interval may not include the true value. For guidance in propagating this uncertainty, see reference 2.

^(b) The values for calcium, manganese, and zinc were determined using a sample size of 10 g. The value for free vitamin B₆ was determined using a sample size of 0.5 g. The value for vitamin E acetate was determined using a sample size of 1 g.

Period of Validity: The non-certified values are valid within the measurement uncertainty specified until **01 December 2023**. The value assignments are nullified if the material is stored or used improperly, damaged, contaminated, or otherwise modified.

Maintenance of Non-Certified Values: NIST will monitor this material to the end of its period of validity. If substantive technical changes occur that affect the assigned values before the expiration of this information sheet, NIST will notify the purchaser. Registration (see attached sheet or register online) will facilitate notification. Before making use of any of the values delivered by this material, users should obtain the most recent version of this documentation, available free of charge at <https://www.nist.gov/srm>.

Safety: RM 8261 is intended for laboratory use only, not for human consumption.

Storage: RM 8261 should be stored at controlled room temperature (20 °C to 25 °C) in an unopened can until needed. An open can may be retested for up to one month after opening, provided that the open can is resealed and stored at controlled room temperature (20 °C to 25 °C).

Use: Prior to removal of a test portion for analysis, the contents of a can of material should be mixed thoroughly. Test portion sizes should be appropriate to the measurands and analytical methods selected.

Homogeneity Assessment: The homogeneity of RM 8261 was assessed as part of the value assignment for elements and vitamins as described in Table 1. Analysis of variance of 10 replicate measurements across the batch at a 5 % significance showed no statistically significant heterogeneity. Homogeneity of other constituents was not assessed.

Other Information of Potential Interest: Additional information from the formulation of RM 8261 is provided in Appendix A. Data in the appendix may be of interest to the RM user, but insufficient information is available to assess the uncertainty associated with the values, therefore no uncertainty is provided. This information cannot be used to establish metrological traceability to the SI or other higher-order reference system.

REFERENCES

- [1] Beauchamp, C.R.; Camara, J.E.; Carney, J.; Choquette, S.J.; Cole, K.D.; DeRose, P.C.; Duewer, D.L.; Epstein, M.S.; Kline, M.C.; Lippa, K.A.; Lucon, E.; Phinney, K.W.; Polakoski, M.; Possolo, A.; Sharpless, K.E.; Sieber, J.R.; Toman, B.; Winchester, M.R.; Windover, D.; *Metrological Tools for the Reference Materials and Reference Instruments of the NIST Material Measurement Laboratory*; NIST Special Publication 260-136; U.S. Government Printing Office: Washington, DC (2020); available at <https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.260-136-2020.pdf> (accessed Apr 2021).
- [2] Possolo, A.M.; *Evaluating, Expressing, and Propagating Measurement Uncertainty for NIST Reference Materials*; NIST Special Publication (NIST SP) 260-202 (2020); available at <https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.260-202.pdf> (accessed Apr 2021).

Information Sheet Revision History: 06 April 2021 (Editorial changes); 25 February 2021 (Homogeneity assessment added; editorial changes); 04 February 2021 (Change of Folic Acid value in Appendix A; editorial changes); 26 January 2021 (Original Information Sheet date).

Certain commercial equipment, instruments, or materials may be identified in this Reference Material Information Sheet to adequately specify the experimental procedure. Such identification does not imply recommendation or endorsement by the National Institute of Standards and Technology, nor does it imply that the materials or equipment identified are necessarily the best available for the purpose.

Users of this RM should ensure that the Reference Material Information Sheet in their possession is current. This can be accomplished by contacting the Office of Reference Materials, 100 Bureau Drive, Stop 2300, Gaithersburg, Maryland 20899-2300; telephone (301) 975-2200; e-mail srminfo@nist.gov; or via the Internet at <https://www.nist.gov/srm>.

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APPENDIX A

Formulation Information Provided by the Manufacturer

Vitamins, Carotenoids, and Related Compounds

Measurand	Amount (mg/100 g)	Measurand	Amount (IU/100 g)
Vitamin B ₁	2.0	Vitamin A Acetate	350
Vitamin B ₂	1.8	Vitamin A Palmitate	1700
Vitamin B ₃ (Niacin)	5.8	Vitamin A (Total)	2000
Vitamin B ₃ (Niacinamide)	16	Vitamin D ₂	420
Pantothenic Acid	9.7	Vitamin D ₃	530
Biotin	0.21		
Folic Acid	0.30		
Vitamin B ₁₂	0.0059		
Vitamin C	150		
Carnitine	6.7		
Choline	940		
Inositol	21		
Vitamin K	0.025		
Beta-Carotene	0.005		
Lutein	0.023		
Lycopene	0.023		

Elements

Measurand	Amount (mg/100 g)	Measurand	Amount (mg/100 g)
Chloride (Cl)	800	Magnesium (Mg)	89
Chromium (Cr)	0.037	Molybdenum (Mo)	0.046
Copper (Cu)	0.90	Phosphorus (P)	230
Iodine (I)	0.032	Potassium (K)	1400
Iron (Fe)	5.5	Selenium (Se)	0.026

Proximates

Measurand	Amount (%)	Measurand	Amount (kcal/100 g)
Fat	16	Calories	400
Protein	15		

Nucleotides

Measurand	Amount (mg/100 g)	Measurand	Amount (mg/100 g)
Adenosine monophosphate	2.0	Guanosine monophosphate	2.7
Cytidine monophosphate	5.4	Uridine monophosphate	2.3

Fatty Acids

Measurand	Amount (mg/100 g)
(Z,Z,Z,Z)-5,8,11,14-Eicosatetraenoic Acid (C20:4 n-6)	Arachidonic Acid 210
(Z,Z,Z,Z,Z,Z)-4,7,10,13,16,19-Docosahexaenoic Acid (C22:6 n-3)	DHA 110

Amino Acids

Measurand	Amount (mg/100 g)
L-tryptophan	70
Taurine	33

Oligosaccharides and Sugars

Measurand	Amount (mg/100 g)
2'-Fucosyllactose (2'-FL)	78
Fructooligosaccharides (FOS)	950

***** End of Appendix A *****