# Processing Analytical Data Using the Redesigned USDA Nutrient Data Bank System



R. Thomas and S. Gebhardt. Nutrient Data Laboratory, BHNRC, ARS, USDA, Beltsville, MD



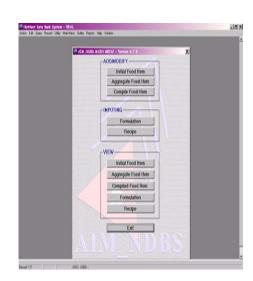
#### **Abstract**

**Objective:** To illustrate the management of analytical data using USDA's redesigned Nutrient Data Bank System (NDBS).

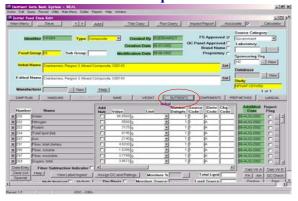
**Methods and Materials:** The redesigned NDBS is a relatively new, complex database management system. The USDA National Nutrient Database for Standard Reference (SR), Release 14, was the first SR release to utilize the redesigned NDBS in 2001. The NDBS integrates the nutrient data through a series of processes from data acquisition to dissemination. The first step is the electronic migration or manual entry of data. Detailed information about the food sampling and handling, data sources, analytical methodology and quality control, weights, and components is documented during this step. Acceptable data from different samples are then aggregated. Comparison reports and outlier tests help evaluate the data before they are aggregated. The final step is compilation which results in the finished food item that's ready for dissemination. The NDBS has the capability to perform various imputing calculations at this step. A step-by-step example is shown to demonstrate some of the details involved from the initial to the compiled stage.

**Results:** An enhanced SR is the current product of the NDBS. Analytical data can easily be viewed and compared, enabling food specialists to produce a more complete and accurate database product. Nutritionists are able to process data in a more timely manner and documentation is more organized and complete.

**Significance:** The management of food composition data relies on the availability of comprehensive data management software which facilitates the documentation, handling, and dissemination of large amounts of data for diverse types of food.



#### **Initial step**



### **Aggregation step**



## Compilation step

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- Data are either migrated from a spreadsheet using an Oracle script or manually entered into the NDBS
- Documentation includes laboratory or publication details and sponsoring organization.
   Sampling plan identifies pick-up location, region, and season; sample handling includes homogenization details.
- This composite is made up of several subsamples (nutrient data from various labs) and sample units (pickup locations).

Nutrient data details captured at this stage include the date and method of analysis; limits of detection and quantification; source codes and derivation codes.

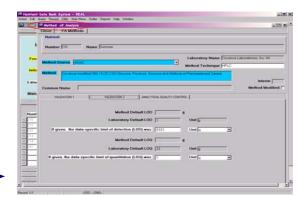
- Data are brought in from all available reliable sources.
- Nutritionist can compare and evaluate the nutrient values visually and by using built-in statistical outlier tests. Any values determined to be unacceptable may be rejected by checking the "Reject Flag" box.

Once all data are reviewed, the nutritionist clicks the "Aggregate" button. The resulting report shows the means for each nutrient, along with other statistics.

- At the compilation stage, the nutritionist brings in the aggregations with the data to be disseminated. Nutrients can still be rejected at this point.
- Any missing nutrients may be imputed now.
  There are several imputing methods from which to choose. For raw cranberries, fatty acids were imputed from currants.

The finishing touches are added on the compiled nutrient tab. The NDBS calculates fatty acid sums, carbohydrate, and energy. Footnotes may be added here. QC checks are run before food specialist can check FS Approved; an item is sent for Technical Review (check TR Approved) prior to dissemination of item in SR.

In the future, data quality indicators will be added.



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255	Water	87.1348	8	0.2772	4	.100	A	1	1	86.6236	87.898	3	86.2526			EB3	rug			
202	Nitrogen	0.0627	8	0.0154	4		A	1	1	0.025	0.089	3	0.0136	0.1115	23	EB3				
203	Protein	0.392	8	0.0965	4		A	1	1	0.1563	0.5563	3	0.085	0.6991	23	EB3				
204	Total livid (fat)	0.1255	8	0.0316	4		A	1	1	0.0745	0.2049	3	0.0248	0.2262	123	EB3				
207	Ash	0.1464	8	0.0285	4		A	1	1	0.0745	0.214	3	0.0557	0.2371	123	EB3				
291	Fiber, total dietary	4.6401	8	0.1172	4		A	1	1	4.2952	4.82	3	4.267	5.0132	23	EB3				
295	Fiber, soluble	0.9276	8	0.1091	4		A	1	1	0.7453	1.1799	3	0.5805	1.2747	123	EB3				
297	Fiber, insoluble	3.7124	8	0.105	4		A	1	1	3.5399	3.98	3	3.3782	4.0466	23	EB3				
269	Sugars, total	4.0367	8	0.2548	4		A	1	1	3.5517	4.7539	3	3.2257	4.8477	23	EB3				
210	Sucrose	0.1256	8	0.0225	4		A	1	1	0.0745	0.177	3	0.0539	0.1973	123	EB3				
211	Glucose (dextrose)	3.2804	8	0.194	4		A	1	1	2.8859	3.7809	3	2.6629	3.8979	23	EB3				
212	Fructose	0.6307	8	0.069	4		A	1	1	0.5139	0.796	3	0.4111	0.8503	23	EB3				
213	Lactose	0	8	0	4		A	1	1	0	0				123	EB3				
214	Maltose	0	8	0	4		A	1	1	0	0				123	EB3				
287	Galactose	0	8	0	4		A	1	1	0	0				123	EB3				
209	Starch	0	8	0	4		A	1	1	0	0				123	EB3				
301	Calcium, Ca	8.3925	mg	0.3596	4		A	1	1	7.36	9	3	7.248	9.5369	2.3	EB3				
303	Iron, Fe	0.2464	mg	0.0476	4		A	1	1	0.1899	0.3889	3	0.0949	0.3979	23	EB3				
304	Magnesium, Mg	5.955	max	0.1247	4		A	1	1	5.69	6.21		5.5583	6.3517		EB3				
305	Phosphorus, P	12.55	mg	0.6589	4		A	1	1	- 11	14.1	3	10.453	14.647		EB3				
306	Potassium, K	85.025	mg	2.4814	4		A	1	1	79	90.8		77.1281	92.9218		EB3				
307	Sodium, Na	1.595	mg	0.9572	4		A	1	1	0			-1.4513	4.6412		EB3				
309	Zinc, Zn	0.0987	mg	0.006	4		A	1	1	0.086	0.115		0.0796	0.1175		EB3				
312	Copper, Cu	0.061	mg	0.0022	4		A	1	1	0.057	0.067		0.0541	0.0679		EB3				
315	Manganese, Mn	0.3602	mg	0.0248	4		A	1	1	0.3269			0.2814	0.435		EB3				
317	Selenium, Se	0.139	meg		2		A	1	1	0.115	0.1629	1			23	EB3				
401	Vitamin C, total ascorbic acid	13.3	mg	1.2376	4		A	1	1	11.8	17		9.3614			EB3				
404	Thiamin	0.0117	mg	0.0012	4		A	1	1	0.0099	0.0149	3	0.0079	0.0154	23	EB3				
405	Riboflavin	0.0199	mg	0.0035	4		A	1	1	0.0149			0.0086	0.0312		EB3				
406	Nucin	0.1015	mg	0.0029	4		A	1	1	0.097	0.1099		0.0923	0.1106		EB3				
410	Pantothenic acid	0.2949	mg	0.0296	4		A	1	1	0.25	0.3799	3	0.2008	0.389	23	EB3				
415	Vitamin B-6	0.0575	mg	0.0131	4		A	1	1	0.0359	0.093	3	0.0159	0.095		EB3				
417	Folate, total	1	meg	0	4		A	1	1	1	- 1				123	EB3				
318	Vitamin A, IU	60	IU	5	- 4		A	1	1	48.3333	68.333		44.0878	75.9122		EB3				
320	Vitamin A, RAE	3 a	ncg RAE	0.25	4		A	1	1	2.4166	3.4166	3	2.2044	3.7955	23	EB3				

