COMPARISON OF SIX NUTRIENT DATABASES WITHIN THE U.S. DEPARTMENT OF AGRICULTURE

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INTRODUCTION

The database comparison I will be describing is a result of an ongoing cooperative effort among six USDA groups and INFOODs. The project originated at a USDA Nutrient Database Capabilities Workshop held last Fall in Bethesda, Maryland. This comparison is a first step towards understanding nutrient database development. Specifically, we need to understand why databases develop independently, how they need to differ given varying regional and population groups, and what the sources of data are in use within USDA. I will be telling you about:

1. Each of the USDA Centers and their missions
2. Describing the goals of the database comparison
3. Introducing the comparison dataset
4. Looking at some of the preliminary results from the comparison
5. Noting some of our future plans

The USDA Groups - Who are we?

Of the six USDA groups represented, the first is a division of the Human Nutrition Information Service, or HNIS. In Hyattsville, Maryland, the HNIS Nutrient Data Research Branch provides information on the nutrient composition of all foods important to the American diet. The other five are Human Nutrition Research Centers, or HNRCs, within the Agricultural Research Service. Each of these USDA Centers share a common mission of researching and reporting on nutritional status and nutrient requirements. However, each Center has its own area of specialty

* The Grand Forks HNRC's mission is to develop recommendations for nutrient intakes with an emphasis on mineral requirements.

* The Boston HNRC's mission is to determine the nutritional needs of the elderly and the relationship of dietary factors to the aging process.

* The Beltsville HNRC's mission is to identify the nutritional requirements of adults and dietary risk factors. The nutrient Composition Laboratory in Beltsville develops food composition analysis methods and provides essential data on the nutrient content of foods.

* In Houston, the Children's HNRC's mission is to research nutrient needs of pregnant and lactating women, infants and children through adolescence.

* In San Francisco, the Western HNRC's mission is to improve methods of assessing human nutritional status and to study the factors that lead to malnutrition.

As you can see, each USDA group, by virtue of its location and its individual mission, may have differing regional, age and ethnic populations, as well as different nutrient interests which may result in different food composition data needs.

THE DATABASES

(Slide #1) Each of the six groups is using an independent nutrient database, although there are actually only three original, core databases from Grand Forks, Hyattsville, and Beltsville. All of these databases are, of course, based on standard reference tapes.

The Grand Forks Nutrient Database (GRAND) contains data for about eighty nutrients. GRAND flags missing values and references sources. GRAND has a unique structure which allows multiple data sources for nutrient values and nutrients are calculated based on an explicit priority of sources. The Boston HNRC also uses GRAND. The Boston and Grand Forks HNRC comparison data were generated from the same version of GRAND using identical source priorities.

HNIS uses the latest version of the Continuing Survey of Food Intake by Individuals (CSFII) database, Release 4, which is not yet available to the public.(1) The CSFII database has no missing values, data has been imputed from other forms of the foods, or estimated from similar foods when there were no analytic values available. The database contains complete data for 28 nutrients and food energy. The Children's HNRC in Houston uses Release 2 of the CSFII database produced by HNIS.

The Beltsville nutrient database contains data for 73 nutrients and missing values are flagged. The Western HNRC uses the Beltsville database. The comparison datasets were processed on different versions of the Beltsville database.

DATABASE COMPARISON GOALS

Compatibility among the nutrient database systems is desirable for scientific validity of results and comparability of nutritional findings from these research centers. Thus, the specific goals of the database comparison are as follows:

* To estimate completeness of food composition data in each database
* To identify and categorize the nutrient data differences
* To identify multiple data sources and their rationale
* To identify food choice and regional assumption differences
* To examine what sort of coordination between the Centers might be possible and productive

TOTAL DIET STUDY DATASET

(Slides #2 & #3) To meet these goals, each Center provided a nutrient analysis for 200 foods for comparison. The dataset chosen is from the Food and Drug Administration (FDA) Total Diet Study(TDS). (2,3) This food list has been derived from information from nationwide surveys and represents those foods which are most frequently consumed in the American diet. The Total Diet Study has been described earlier in this conference. Since composites of these individual foods are being collected and analyzed for a complete nutrient profile, a large amount of validated analytical information is or will be available for these foods.

The following slides contain the foods ranked by gram weight for the Total Diet Study

Population of Males, 25-30. The food descriptions are fairly complete, in most cases better than we might see on a food record. The 200th food is listed to illustrate how small the gram weights become in those foods least commonly consumed. You'll notice that it is differences in many of these "top" foods that show up later in the comparisons.

It is expected that this dataset is a "best case" scenario for testing of database contents and does not address the issue of coding variability and portion size selection.

Directions were given to each Center to code these foods with a male, 25-30 population in mind and also to use whatever site-specific coding assumptions that have been set up.

RESULTS

The 28 nutrients common to all six databases have been chosen for comparison. The following slides represent the mean, standard deviation and coefficient of variation, expressed as a percentage for the total of the 200 foods. The CV is the standard deviation divided by the mean and it allows us to measure the relative variability among the nutrients.

(Slide #4) For the macronutrients there is much agreement in the aggregate. For calories, the mean of the six Centers is 2600, the SD is 50 and the CV is 2%. For protein, carbohydrate, cholesterol, and alcohol the CV is less than 2%. Total fat shows slightly higher variability among the Centers with a CV of 4%. Dietary fiber, a nutrient that varies widely among the Centers has a CV of 72% and is the second most variable nutrient for the USDA databases. The databases report complete data for calories, protein, fat, carbohydrate, and cholesterol for the 200 foods. Dietary fiber and alcohol completeness will be discussed later in the presentation.

(Slide #5) For the water soluble vitamins, the closest agreement of the Centers is seen in riboflavin and niacin, both with CVs around 2%. Vitamin C, has a CV of 5%. The remaining B vitamins - thiamin, B6, B12, and folate have CVs of greater than 10%. For Vitamin C, thiamin, riboflavin and niacin all six databases report complete data. For Vitamin B6, B12 and folate some of the databases have missing data.

(Slide #6) The fat soluble vitamins, Vitamin A in IU's has a CV of 2%, whereas Vitamin A in retinol equivalents has a CV of almost 10%. Vitamin E, alpha-tocopherol, has the greatest variability among the Centers, with a CV of 75%. All six databases report complete data for Vitamin A in IUs, but not for retinol equivalents. Vitamin E completeness will be highlighted later.

(Slide #7) The minerals iron, calcium, potassium and phosphorus have the most agreement with a CV of less than 5%. Zinc and copper have a CV of over 20%, magnesium with a CV of 17% and sodium has a CV of 8% across the Centers. Sodium is the only mineral with a CV above 5% for which the databases report complete data. Some databases are missing data for zinc, copper and magnesium, causing the higher CVs.

(Slide #8) As I already noted, total fat has a CV of 4%, while the fat components have higher variability. For saturated fats a CV of 6% and 20% coefficient of variation for polyunsaturated and monounsaturated fats. Several of the six database are missing data for the fat components.

(Slide #9) Although the calories and fat totals did not vary widely, it was interesting to note the reasons why they were different. This slide depicts the foods which contributed the most to total calories, the range of values for the six databases and the coefficient of variation for each food. The ranking for each food for these slides is based on the mean values across all databases for each food in the Total Diet Study units. The foods with the greatest variability are two beef cuts, and french fries. These foods are the predominant reason for the differences in both calories and fat totals. (Milk and Cola, with a CV of L. zero, had identical values for all six databases.)

(Slide #10) This slide contains the calories and fat values for "beef steak" in the six databases. The values are based on the Total Diet Study serving size of 50 grams. The databases have been keyed to show the three database pairs that I identified earlier. The database "a" is the original "core" database, and "b" represents the "user" database.

The database caloric values range from 142 - 207 for this particular food. The first database pair represents the same code selection for beef sirloin, pan-cooked from the new USDA Handbook 8-13 (4) release. The second database pair show differences between new and old USDA Handbook (5) data, as well as cut differences, top loin vs. sirloin. The third database pair has the same database food selection, a composite fried beef steak, with just the Handbook differences. There's a difference of almost 50 calories and 7 grams of fat between and handbook releases for the same food. The other beef code, chuck roast, shown on the previous slide with a CV of 12%, shows similar differences between the old and new releases for fat content.

(Slide #11) This slide illustrates the calorie and fat values for french fries for a TDS serving size of 33 grams. There is a difference of 35 calories and 3 grams of fat among the data bases.

The highest fat values (6.1 grams) for database I pair, are for the extruded potato. (Extruded potatoes are those that are pressed or formed when processed.) The lowest values are for Database III pair (2.9 grams), described as "Fried, frozen, oven heated". Database IIa chose the home-prepared potato which is similar to the values reported for Database III. Database IIb chose restaurant fried potatoes, which are similar to the extruded variety.

These are four items from the USDA Handbook with very different values. Given the food description supplied, any of these except perhaps IIa's choice of home-prepared potatoes might be appropriate. Do we need to collect brand name information to adequately assess nutrient intake? If specific brand information is unavailable the choice is to risk overestimating or underestimating nutrient intake.

(Slide #12) This slide represents the top seven contributors to total fat based on the mean values across the Centers. Note that there are three beef codes, steak, chuck roast and ground beef contributing to the differences. Among the three beef codes the reasons for differences were attributable to USDA handbook differences, cut (sirloin/round/top loin), and cooking method (broiled/fried), doneness (rare-to-medium, well-done). The two databases with old handbook values for beef have the highest total fat and calories values among the six databases in the aggregate. French fry differences produce a CV of 39%.

(Slide #13) Dietary fiber, in the aggregate, has a CV of 72% across the Centers. These graphs represent the relationship between the total value for dietary fiber for the six databases vs. the percent complete data. The top graph shows the dietary fiber values, in grams, for the six databases. The bottom slide shows the percentage of the 200 foods for which each database reports dietary fiber values. The USDA database pairs are represented on the graph with the dark bar for the "core" database. The gray bar is the "user" database. For the total of the 200 foods, database pair II reports the lowest values, 2.25 and 1.57 grams, and also the lowest number of foods with data for dietary fiber. Nineteen percent and 16%, or 38 and 32 foods out of 200 have dietary fiber values in this database. Database I reports the same trend with values of approximately 8 grams and 39% complete data for dietary fiber. One-hundred percent complete data, for database pair III, yields values of approximately 16 grams for dietary fiber.

(Slide 14) This slide represents the top contributor foods for dietary fiber. Ranking is determined by database IIIa, as the complete "core" database. Database pairs I and II reported the lowest values, and they are missing data for these important contributor foods. CVs are calculated for the values present. This is somewhat misleading - because if zeros were attributed to these foods - the CVs would be much higher. It is noteworthy that there is little agreement when there is data for more than one database (pinto beans, and pork and beans report three different values). For corn, we see database Ia with a blank value and database Ib with a value of 0.342. The selection of corn on the cob vs. corn off the cob accounts for the difference. When I looked at the 31 foods for which all databases reported data, I found that there was only one food (corn grits) for which there was agreement among the six databases. Code selection, data sources, and perhaps definition of dietary fiber are causes for the differences.

As an aside, it is interesting to note that in this dataset, beer is a top contributor to dietary fiber. Beer is weighted heavily - with an approximate 12 fluid ounce serving attributed to the dataset. It also shows up as a top contributor to calcium. Sometimes top contributor foods to a population are not necessarily good contributors.

(Slide #15) Vitamin B6, for this diet had a CV of 13%. This slide shows the B6 values, in milligrams, on top, and the percent of the 200 foods with B6 values on bottom. The Database II pair has less than 70% of the foods with data, the Database I pair has about 90% of the foods with values. The missing data is reflected back in the totals. Database III pair report complete data with Database IIIa reporting the highest totals for Vitamin B6. Note that Database IIIb B6 values are lower than both Database IIIa and Database I pair. This difference between Databases IIIa, IIIb is predominantly due to Handbook difference for beef steak and chuck roast. The new beef handbook reports higher B vitamin values. Vitamin B12 and Folate have similar patterns for missing data values. Per food differences for these nutrients have not been investigated yet.

Generally, it is the case that where there is complete data available among the six databases, values are comparable and CVs for the aggregate are less than 5%. Two vitamins did not fit that pattern, thiamin and vitamin C, with CVs over 5%. This was unusual because each database reports complete or near complete data for these nutrients.

(Slide #16) This slide, represents the top contributor foods to thiamin. These foods that rank six through eight have a CV of less than 5% and were omitted. As you can see, seven of the top 10 contributor foods have high variability. The first food, macaroni and cheese, with a CV of 170% is a probable error in two of the databases. The values of .904 and .361 reported by a database pair are a hundred times higher than what the other database pairs reported. These two values, if adjusted, would change the thiamin aggregate CV to less than 5%.

The white bread and white rolls differences are attributable to update status differences among the databases. Three databases do not have the 1981 Provisional Table on the Nutrient Content of Bakery Foods and Related Items (6) reflecting higher enrichment standards. Provisional Table thiamin values are 15% higher than old Handbook 8 values.

Again, we see the beef - the old and new handbook data differences, cut, and cooking method selections produce a CV of 30% for thiamin. The french fries show up again, the extruded variety has less thiamin than the other varieties. Pork chop has a CV of 12%. Three databases reported .097 for thiamin. The other three reported .120. Among the databases there are nearly identical food descriptions for pork and the same Handbook 8 code, but different values. My guess is that the high value of thiamin is from a leaner cut of pork, but that the food description does not reflect this leaner cut difference.

(Slide #17) For vitamin C, the most apparent difference is attributable to an error in one of the databases. A value of 11.1 for the orange drink is an error in one of the databases - the correct value is 5.8. If this value is corrected, the total vitamin C for this database is brought much closer to the mean, bringing the CV under 5%. Again, the french fries in the extruded form show less vitamin C available. The ham in the database I pair has a blank value for vitamin C. The nutrient information for this food is from HB8-10 which does not report a value for vitamin C for this particular cut of ham. Other

HB8-10 ham items did have vitamin C values. It is possible that other databases chose different cuts or imputed for vitamin C from other cuts of ham. The sixteenth food was highlighted because it was the only actual regional coding difference found so far. One center chose green looseleaf lettuce, with 4.2 milligrams of vitamin C. The other five of the centers chose the iceberg lettuce with .9 milligrams. This difference produces a CV of 92%.

(Slide #18) As I mentioned earlier, those databases with less than complete data, reported lower values for many of the nutrients. The following slides illustrate this. For zinc intake, the databases with complete and near complete data, database pair III and I, respectively report similar zinc values(15-16mg). Database pair II has less zinc data (approximately 70%) and the totals are much lower (8 and 11mg).

This same pattern is seen for copper and magnesium values in relation to percentage of complete data and total values.

The six databases report complete data for sodium, yet there is a CV of 8% for the totals. One of the reasons for this variability is coding defaults. Some centers assume "with salt", other centers choose "unsalted" food items.

(Slide #19) Vitamin E, with a CV of 74% is the nutrient with the most variability. The primary reason for the difference is completeness of data for the 200 foods. Database pairs I and II have very little data for this nutrient, ranging from 10 to 30% completeness. The totals for vitamin E range from 1.6 to 8.8 milligrams.

At first glance, it may appear from these data that given missing value percentages one could perform a mathematical correction to approximate complete data. Let me offer two counter examples.

(Slide #20) This slide shows the implications of missing data for the nutrients vitamin B6 and zinc. Database IIIa has complete data (100%), whereas Database IIb has the least data of the six databases. Database IIb happens to have the same number of foods with data (136/200) for both B6 and zinc (68% completeness).

For vitamin B6, the complete database reports 1.95 milligrams for the totals. Database IIb reports 1.32 milligrams which happens to be 68% of the complete database's total.

For zinc, the complete database reports 15.2 milligrams for the totals. Database IIb reports 8.4 milligram. The value of 8.4 is actually only 55% of the complete database's total. This suggests that while completeness statistics are important, they cannot be used to calculate out a "true" value. If one used the completeness statistics of 68% to calculate a better value one would be underestimating intake with 12.35 milligrams, as opposed to the 15.2 milligrams reported by Database IIIa.

Of the "top 100" contributor foods (determined by the mean of the six Centers) for each nutrient we see that zinc has 57 foods with values, while vitamin B6 has values for 67 foods of the "top 100". Thus, vitamin B6 has more of the "important" contributor foods with values.

(Slide #21) Alcohol was the nutrient where completeness statistics least reflected back into data values. This slide shows that the alcohol values for the six databases are nearly identical. The bottom slide shows Database pair II with only 1.5% complete data, or 3 foods with alcohol values. As it turns out there were only three foods containing alcohol in the data set - beer, wine, and whiskey. The reason for the differing completeness statistics is that databases I and III have imputed zeros to the other 197 foods for alcohol. Database II reports blank values for alcohol for the other 197 foods.

COMPARISON OF SIX NUTRIENT DATABASES

SUMMARY

Revised USDA Handbook data can be significantly different from old Handbook data. This was demonstrated in beef values for fat, calories, B-vitamins and minerals. In the Provisional Tables for bakery products B vitamin values were higher than those previously reported. This highlights the importance of updating our databases.

Erroneous nutrient values for a single food can affect nutrient totals. Thiamin and Vitamin C totals were affected by errors in the foods, macaroni and cheese and orange drink with vitamin C.

Data completeness can affect nutrient totals. Cooking method, cut selection, and doneness can affect nutrient totals. This was seen especially in the meats, where leaner meats have higher mineral and vitamin values.

Fat and sodium content of foods on the market and in the USDA Handbooks vary considerably. Brand names of commercial products must be identified for coding of some foods.

This has been a preliminary look at this database comparison. In the future, we will continue to investigate the database differences. Also, there are plans to compare the mean value of the Centers to the analytic values available for the composite of the Total Diet Study foods. We will discuss among the Centers whether we should we formalize a database quality review process within USDA - perhaps utilizing the Total Diet Study dataset.

Update status of the databases will be investigated and incorporation of CSFII values into the other databases is planned.

We would appreciate comments and suggestions regarding the findings and direction of this project.

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USDA Databases

Core	Grand Forks HNRC	Hyattsville HNIS	Beltsville HNRC
	▼	▼	▼
User	Boston HNRC	Houston HNRC	Western HNRC

Slide #1

Total Diet Study Foods for Males (25-30)

Rank*	Gram Wt.	Food Description
1	354.204	Coffee beverage, from instant
2	299.202	Beer, canned
3	214.529	Carbonated soda, sweetened, cola type, canned
4	167.877	Whole milk, fluid
5	143.786	Tea beverage, hot, made with tea bag
6	77.529	Carbonated soda, sweetened, lemon-lime type, canned
7	73.843	Lowfat milk, 2% fat, fluid

Slide #2

Total Diet Study Foods for Males (25-30)

Rank*	Gram Wt.	Food Description
8	58.954	Orange juice, frozen, reconstituted
9	49.476	Beef (loin/sirloin) steak, pan-cooked with added fat
10	36.720	White bread, enriched
11	32.750	French fries, frozen, commercial, heated
12	23.917	Spaghetti with meat sauce, homemade
13	23.381	Lettuce, raw
200.	0.106	Prunes, dried, uncooked

* Ranked by weight

Slide #3

Variability Among Six USDA Databases

Nutrient	Mean	SD	CV%
Calories (kcal)	2600.4	50.2	1.9
Protein (g)	103.2	1.6	1.5
Total Fat (g)	116.1	4.8	4.2
Carbohydrate (g)	265.8	3.1	1.2
Dietary Fiber (g)	8.6	6.2	72.3
Cholesterol (mg)	478.4	5.3	1.1
Alcohol (g)	14.9	0.1	0.6

Slide #4

Variability Among Six USDA Databases

Nutrient	Mean	SD	CV%
Vitamin C (mg)	94.6	5.14	5.4
Thiamin (mg)	1.9	0.33	17.8
Riboflavin (mg)	2.2	0.05	2.2
Niacin (mg)	25.0	0.39	1.6
Vitamin B_6 (mg)	1.7	0.22	13.2
Vitamin B_{12} (mcg)	8.6	1.41	16.3
Folate (mcg)	253.5	29.01	11.4

Slide #5

Variability Among Six USDA Databases

Nutrient	Mean	SD	CV%
Vitamin A (IU)	6584.3	155.39	2.4
Vitamin A (RE)	1073.3	104.49	9.7
Alpha-tocopherol (mg)	4.5	3.36	74.8

Slide #6

Variability Among Six USDA Databases

Nutrient	Mean	SD	CV%
Iron (mg)	16.1	0.7	4.3
Zinc (mg)	13.4	3.0	22.4
Copper (mg)	1.1	0.3	26.2
Calcium (mg)	908.0	27.2	3.0
Magnesium (mg)	271.5	46.4	17.1
Sodium (mg)	3703.3	318.9	8.6
Potassium (mg)	3053.2	55.0	1.8
Phosphorus (mg)	1579.1	31.9	2.0

Slide #7

Variability Among Six USDA Databases

Nutrient	Mean	SD	CV%
Total Fat (g)	116.1	4.8	4.2
SFA (g)	43.7	2.6	6.0
PUFA (g)	14.5	3.0	20.3
MUFA (g)	37.4	7.6	20.4

Slide #8

Highest Nutrient Contributors for Calories (kcal)

Rank*	Food Name	Range	CV%
1	Beef steak	142 - 207	15.0
2	Beer	123 -126	1.0
3	Whole milk	-	0
4	White Bread	98 - 99	0.5
5	French fries	72 - 106	20.0
6	Cola soda	-	0
7	Chuck roast	57 - 82	12.0

*Ranking based on mean values across all databases per Total Diet Study units (males 25-30)

Slide #9

Beef (loin/sirloin) Steak Pan-Cooked with Added Fat

	Ia	Ib	IIa	IIb	IIIa	IIIb
Calories (kcal)	168	168	142	207	143	190
Total Fat (g)	12.2	12.2	9.7	17.9	8.6	15.7
	New H8-13 beef sirloin pan-cooked		New H8-13 short top loin broiled	Old H8 sirloin broiled	New H8-13 sirloin/round composite fried NS fat	Old H8

Slide #10

French Fries, Frozen Commercial, Heated

	Ia	Ib	IIa	IIb	IIIa	IIIb
Calories (kcal)	106.8	106.8	72.7	103.2	72.3	72.3
Total fat (g)	6.1	6.1	2.9	5.4	2.9	2.9
	Extruded, fried Frozen, oven-heated		Home pre-pared	Rest. fried	Fried, frozen, oven heated	

Slide #11

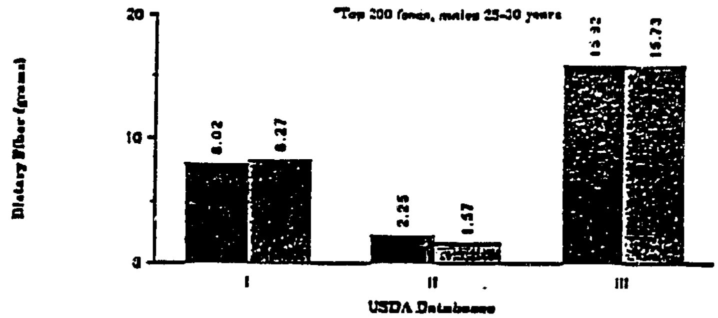
Highest Nutrient Contributors for Total Fat (g)

Rank*	Food Name	Range	CV%
1	Beef steak	8.6 -17.9	28
2	Whole milk	-	0
3	Chuck roast	4.1 - 7.4	21
4	French fries	2.8 - 6.1	39
5	Margarine	-	0
6	Ground beef	3.4 - 3.9	5
7	Cheddar cheese		0

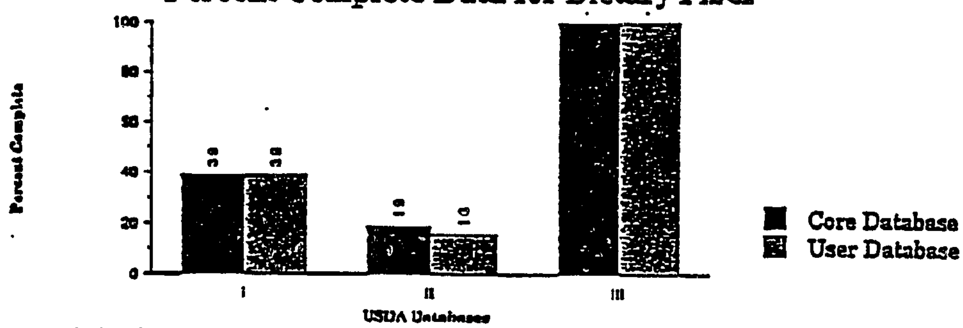
*Ranking based on mean values across all databases per Total Diet Study units (males 25-30)

Slide #12

Dietary Fiber Intake for Total Diet Study Foods*



Percent Complete Data for Dietary Fiber



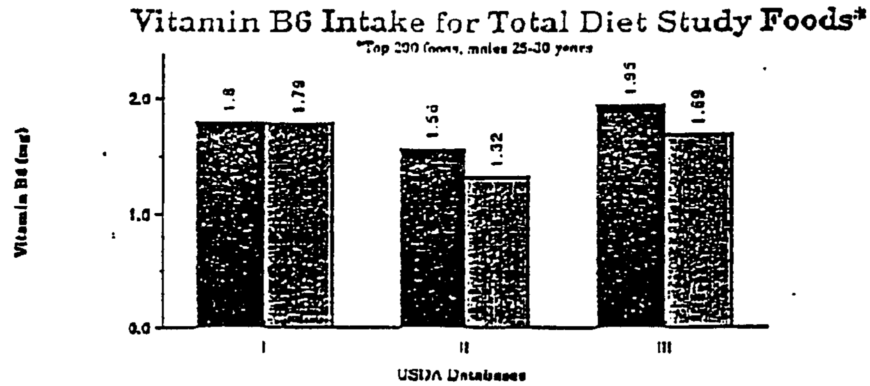
Slide #13

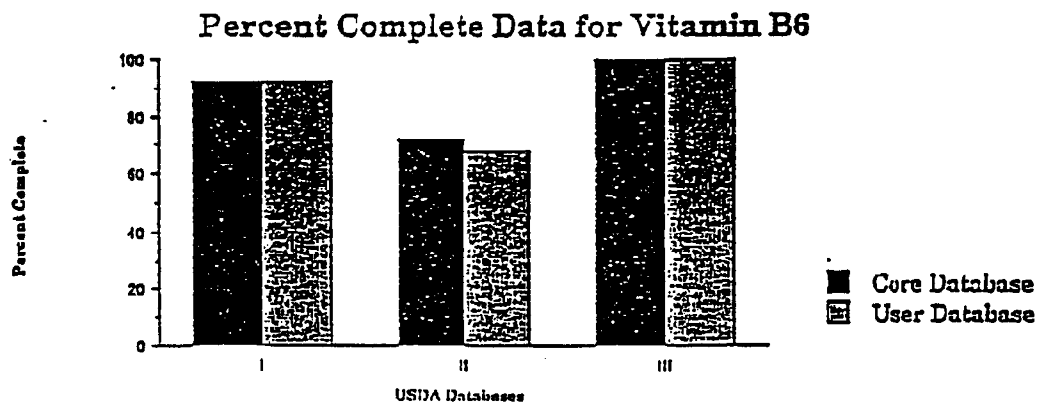
Highest Nutrient Contributors for Dietary Fiber (g)*

	Ia	Ib	IIa	IIb	IIIa	IIIb	CV%
French Fries					1.041	1.041	0
W.W. bread	.661	.661			.879	.879	16.3
Pinto beans	.426	.426			.791	.493	32.7
Pork & beans	.266	.225			.696	.696	55.0
Beer					.598	.598	0
White bread	.991	.991			.588	.588	29.5
Corn		.342	.153		.400	.400	36.2

*Ranking based on Database IIIa per Total Diet Study units (males 25-30)

Slide #14





Slide #15

Highest Nutrient Contributors for Thiamin (mg)

Rank*	Food Name	Range	CV%
1	Macaroni & cheese	.004 - .904	170
2	White bread	.146 - .173	9
3	Pork chop	.097 - .120	12
4	White rolls	.08 - .10	12
5	Ham	.071 - .089	10
9	Beef steak	.030 - .058	30
10	French fries	.026 - .057	31

*Ranking based on mean values across all databases per Total Diet Study units (males 25-30)

Slide #16

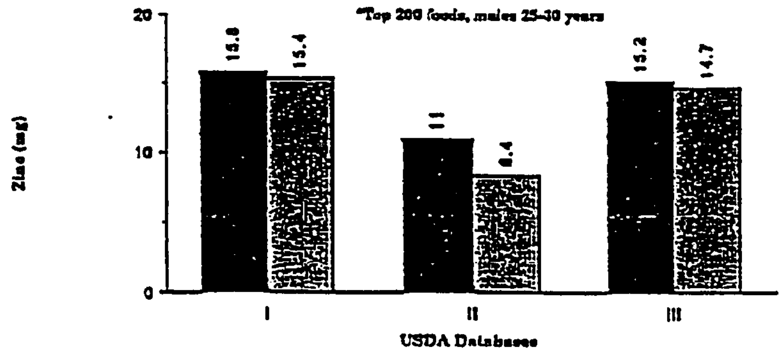
Highest Nutrient Contributors for Vitamin C (mg)

Rank*	Food Name	Range	CV%
1	Orange juice	22.5 - 22.9	0.8
2	Orange drink + vitamin C	5.8 - 11.1	32.1
3	Raw orange	4.9 - 5.3	3.1
4	Tomato soup	-	0
5	Raw tomato	-	0
6	French fries	2.0 - 3.6	25.4
7	Ham	__ - 2.7	1.6
16	Lettuce raw	.9 - 4.2	92.1

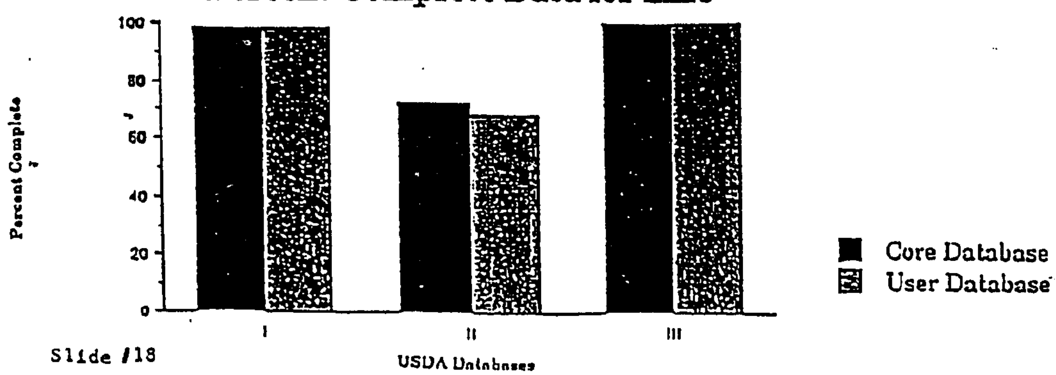
*Ranking based on mean values across all databases per Total Diet Study units (males 25-30)

Slide #17

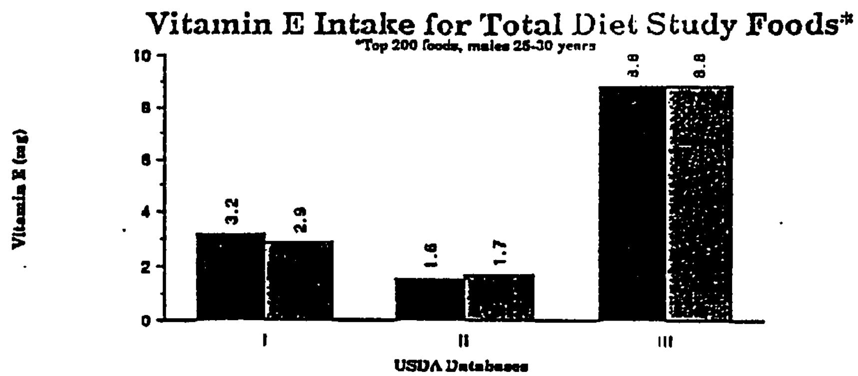
Zinc Intake for Total Diet Study Foods*

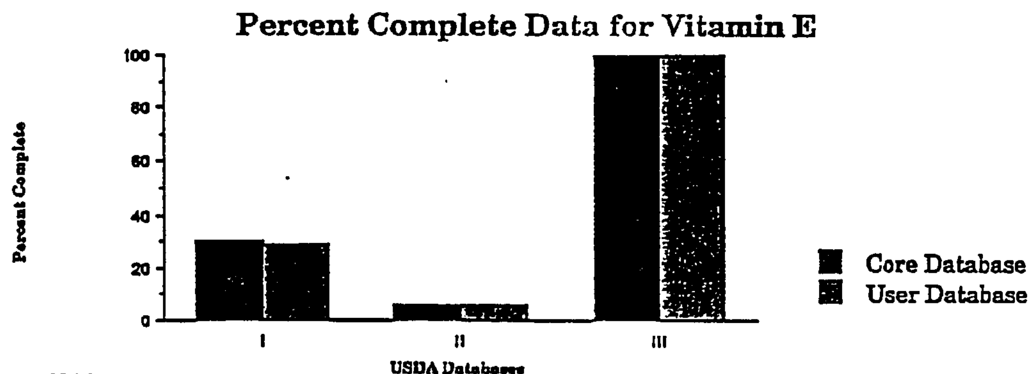


Percent Complete Data for Zinc



Slide #18



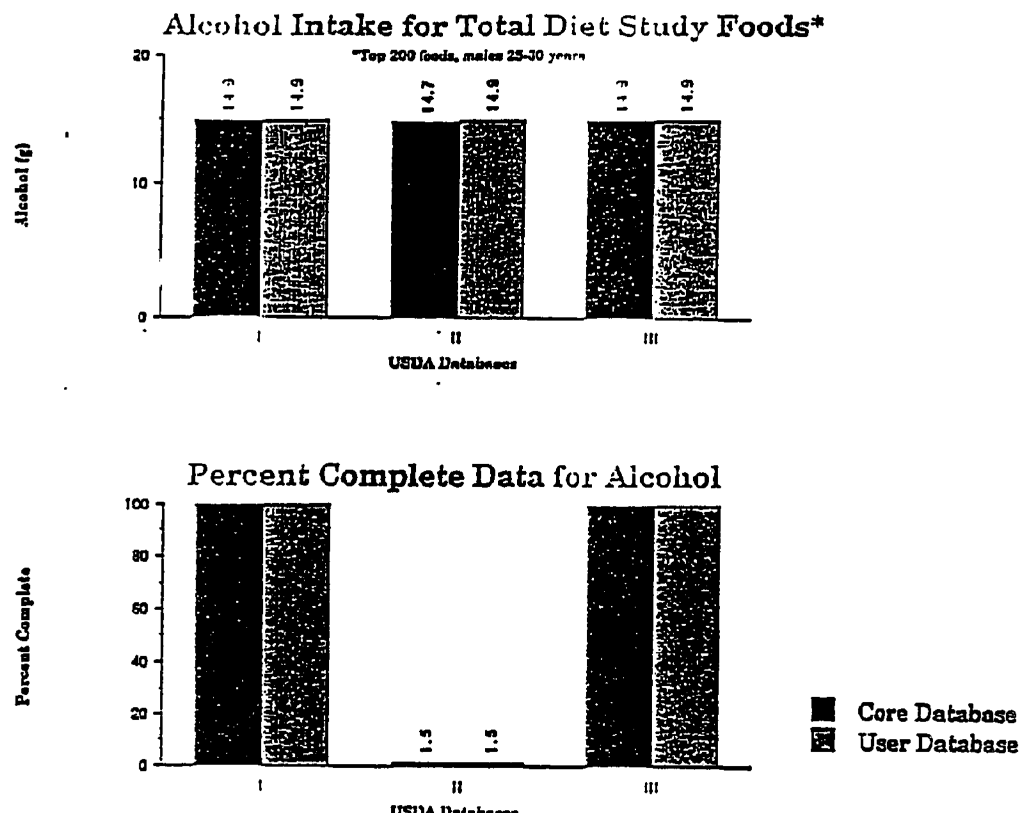


Slide #19

	Database IIIa (200 Foods) 100%	Database IIb (136 Foods) 68%	"Top 100" Foods With Values
Vit B_6(mg)	1.95	1.32	67
Zinc (mg)	15.20	8.40	57

Conclusion: Completeness statistics are important to report, but they may be misleading

Slide #20


Alcohol Intake for Total Diet Study Foods*
*Top 200 foods, males 25-30 years
Alcohol (g)
20
10
0
14.9
14.7
14.9
14.9
I
II
III
USDA Databases
Percent Complete Data for Alcohol
Percent Complete
100
80
60
40
20
0
1.5
1.5
I
II
III
USDA Databases
Core Database
User Database

Slide #21