

USDA Monitors Sodium in Processed and Prepared Foods

The National Nutrient Data Bank

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Today's Topics:

■ To discuss:

- 1. NDL monitors sodium in foods**
- 2. Selected results by brand and portion-size**
- 3. Challenges of data acquisition for processed and prepared foods**

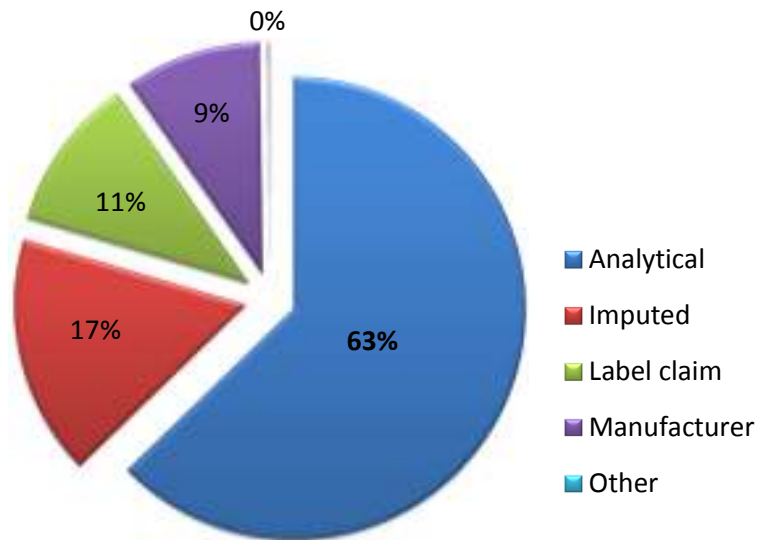
Sodium in Foods

- Processed and Prepared (P&P) foods contribute > 75% of dietary sodium - some mods are possible
- Differentiation of P&P products by market source- restaurants vs. retail markets
- Agri. commodities with low levels of sodium - not likely to change vs. “enhanced meats, fish, poultry”
- Increased offerings in convenience stores, food carts, other “informal” outlets
- Schools and workplace settings
- Salt added during domestic preparation-1-3%

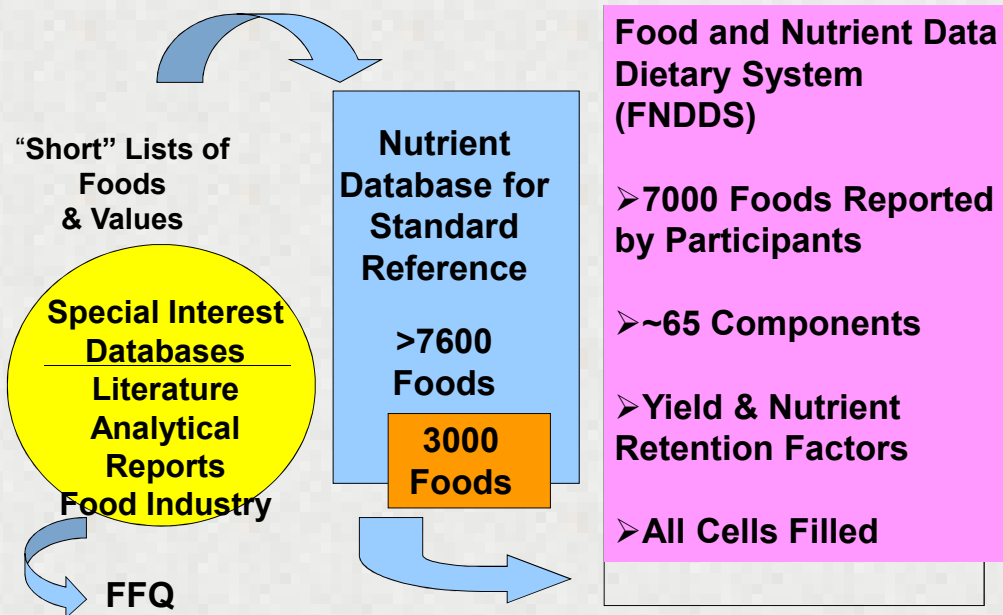
USDA’s Nutrient Database for Standard Reference (SR24)

- SR annual releases – SR 24 (September, 2011)
- 7900 foods, up to 140 dietary components
- Traditional nutrients, more specific forms, emerging interests
- **Sodium has been included since 1963 HBk-8**
- SR provides the foundation for most other databases
 - National surveys: NHANES: What We Eat in America (for FNDDS development)
 - Therapeutic, clinical, research databases (NCC-NDS-R)
 - Product development, labeling, regulation
- **Availability – www.ars.usda.gov/nutrientdata**

Sources of Sodium Data in SR24



NDL's SR Provides Values for the FNDDS



Assessment of Sodium Intake in WWEIA

- ~7000 foods are reported by survey participants
- Intake of P&P foods, including restaurant reports have increased
- FSRG-food categories for sodium sources
- NDL and FSRG set priorities for Na monitoring
- More than 100 foods have been identified to represent the 100+ categories

Development of Databases: The Process

- Acquisition of data-sources
- Evaluation of data quality
- Aggregation of acceptable values
- Compilation and calculations
- Dissemination of database

Sources of Data

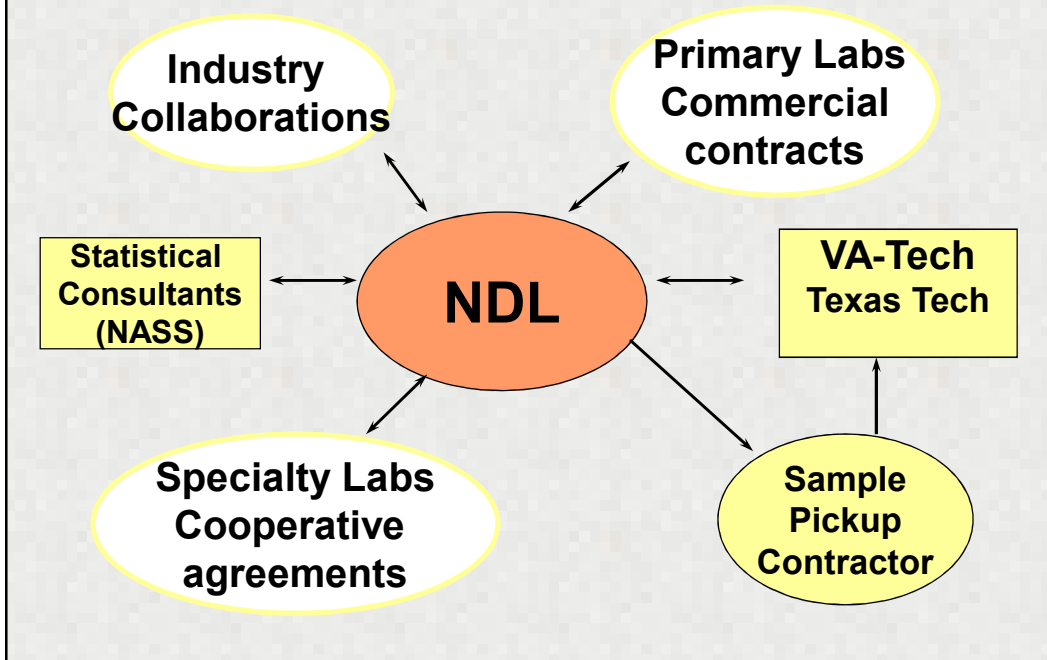
**Food Industry
Scientific Literature
Other Government Agencies
Standard Recipes and Algorithms**

**National Food and Nutrient Analysis
Program (NFNAP)**

Acquisition of Data

- **Food Industry provides calculated or analytical data for products**
- **Industry develops data for up to 14 nutrients (mandatory food labeling)**
- **Some industries collaborate with USDA on analytical projects**
- **Recipe calculation and formulations**
- **Limited data from scientific literature**
- **USDA NFNAP analytical projects**

NFNAP Infrastructure



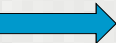
NFNAP: Specific Aims

- **Identify Key Foods and critical nutrients**
- Evaluate existing data quality
- **Devise and implement a nationally-based sampling plan**
- Analyze sampled foods/ valid methods
- **Compile/ disseminate representative estimates**

NFNAP: Aims

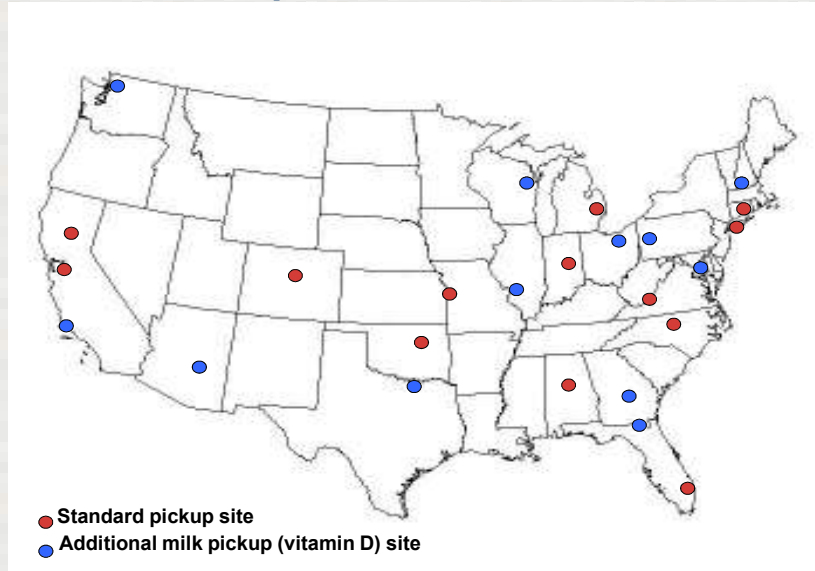
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NDL's NFNAP Sampling Plan

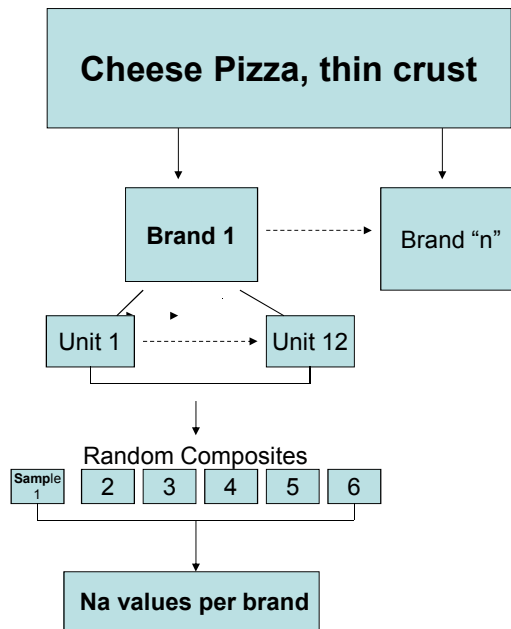
- Multi-stage probability-proportional-to-size (PPS) sampling frame
- Census 2000  Census 2010 data
- Counties, Outlets*, and Foods
- At each level statistical algorithms are used

*e.g., Supermarkets, Fast food, Homes

NFNAP Sampling Plan Pickup Locations for Foods



Sampling of Cheese Pizza, Frozen



NFNAP: Aims

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- **Analyze sampled foods/ valid methods**
- Compile and disseminate representative estimates

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Sodium: Progress for 2010-2011

- **Forty foods were identified per year**
- **Types and brands of each food were identified & selected per market share**
- **Sample units selected in supermarkets, fast food and/or family style restaurants**
- **Sample units were processed at VA Tech and sent to laboratories**
- **QC mats were embedded**

Processed and Prepared Foods Sodium Content Varies

- › **Different brands have different formulations**
- › **Food policy may affect sodium levels:**
 - Statistical distribution shifts
- › **Serving size may differ**
- › **Processing methods differ, e.g., oil vs. dry roasting**
- › **Different sources of data for cooked and raw forms of the same food**
- › **Sodium- Less variability in labs' performance and their methods**

Foods Analyzed in 2010-2011

- **Beef frankfurters**
- **Fast food cheese, pepperoni, and sausage pizzas**
- **White and wheat breads**
- **Macaroni and cheese, boxed dry mix**
- **Fast food tacos and quesadillas**
- **American processed cheese food and product**

Sodium in Meats

Meat	Range of Sodium values (mg / 100g)
Poultry	
Chicken or turkey, meat only	50 - 100
Chicken, boneless breast meat*	~100
Chicken, boneless breast meat, enhanced*	~350
Chicken or turkey, canned	250 - 500
Pork	
Pork, fresh, non-enhanced, lean and fat	40 - 90
Pork, fresh, enhanced, lean and fat	150 - 240
Pork, cured, ham, lean and fat	700 - 1400
Beef	
Beef, lean and fat	40 - 90

*Preliminary values from 2008 study

Sodium in Beef Frankfurters, Raw (mg/100g)*

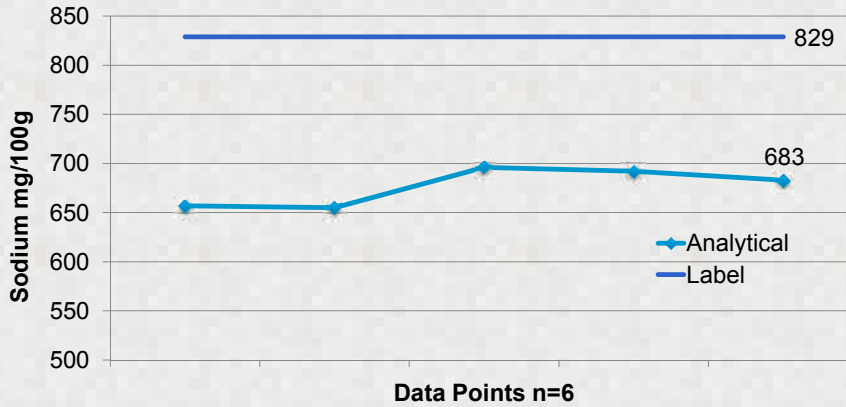
*One U.S. frankfurter weighs approx. 57 gm

Description	Year	Mean	n	CV%	Min	Max
Brand A	2002	1140	1			
	2010	1103	6	4	1030	1150
Brand B	2002	1309	1			
	2010	898	6	3	860	934
Store Brand	2002	1090	2	2	1080	1100
	2010	1109	6	6	987	1190

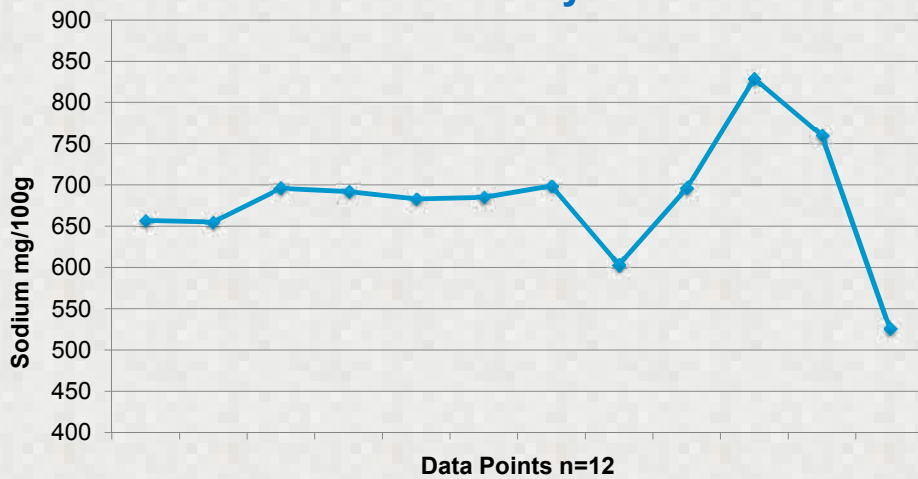
Sodium Values in Selected Raw Seafood (mg/100g)

NDB_No	Description	SR22	SR23	NFI samples	NFI individual values
15019	Pacific cod	71	303	109	80, 72, 174
15066	Walleye pollock	99	333	159	182, 146, 149
15085	Sockeye salmon	47	112	71	129, 39, 44
15149	Shrimp, mixed species	148	566	119	119, 115, 123

**Macaroni and Cheese,
boxed dry mix, unprepared**
Analytical vs. Label Values for Brand A

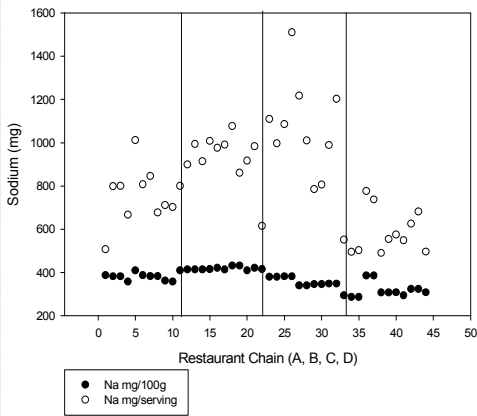


Macaroni and Cheese
boxed dry mix, unprepared
Store Brand Variability for Sodium

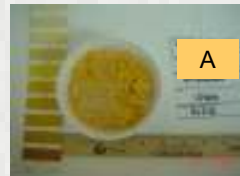


Sodium in Macaroni and Cheese Restaurants' Children's Menu

Sodium in 100g v. Single Serving



**Portion Sizes for Mac and Cheese
Vary Across 4 Restaurant Chains**



Chain A=198g



Chain B=223g



Chain C=298g



Chain D=184g

Sodium in Family Restaurant Foods

Food	A	B	C	D
	mg Sodium / 100 g			
French Fries	46	521	48	374
Chicken Nuggets/Tenders	656	555	684	524
Fried Shrimp	877	714	1136	685
Mac and Cheese	317	380	359	417
Mozzarella Sticks	933	793		656
Steak	349	549	134	194
Catfish			414	

Sodium in Family Restaurant Foods

Food	A	B	C	D
	mg Sodium / serving			
French Fries	75	991	91	843
Chicken Nuggets/Tenders	438	606	733	644
Fried Shrimp	876	1135	1845	808
Mac and Cheese	583	754	1070	938
Mozzarella Sticks	2003	2230		1322
Steak	372	982	198	356
Catfish			735	

Challenges for Sodium Monitoring

- Marketplace has changed-more P&P foods
- Market share data are needed
- Profiles for restaurant foods are not widely available at point of purchase
- Observed variability among brands/chains
- Data are elusive and acquisition of accurate data is time-consuming
- Websites may be inaccurate or out of date

Conclusions

- **The food (and DS) supplies are dynamic; intermittent monitoring is required**
- **“Agricultural commodity” foods are changing**
- **Analytical data for high ranking foods are essential to USDA’s food (and DS) databases**
- **Nationwide sampling is critical**
- **About 90 P&P foods will be completed through 2012**
- **Data are essential to support research as well as healthy choices for NA-sensitive pop’s.**

Acknowledgments-USDA Staff

- **Pamela Pehrsson**
- **Melissa Nickle**
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- **Jacob Exler**
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- **Charles Perry, Statistician**

NDL Staff Changes

- **Jaspreet Ahuja:** with Robin Thomas
- Fruits, Grains, Nuts and Seeds, Breakfast Cereals, and the Survey Nutrient File prep
- Formerly with FSRG
- **Janet Roseland:** with Juhi Williams
- Meats, poultry, game meats; amino acids
- Formerly Coordinator for DSID
- **Karen Andrews:** now DSID Coordinator

Support and Collaboration

- **USDA Base Funding**
- **Institutes and Offices of the NIH, FDA, CDC-Atlanta, and CDC-NCHS**
- **Collaborations with the National Cattlemen’s Beef Association, the National Pork Board, National Fisheries Institute, and other food industry members**
- **Industry data submitted “food by food”**

Thank you!



Questions?

