

NATIONAL FLUORIDE DATABASE DEVELOPMENT

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Tap/Drinking Water

approval.

Tap water sampling procedures for study were implemented

immediately following the February 2003 federal OME



Inoridate

30%

What Water was Collected?:

bottled water

1%

75%

12%

well water

What Are the Pipes Leading To The Sinl

Do You Have A Home Water

Treatment/Purification System?

plasti

Is Your Water Fluoridated?

Objective: The National Fluoride Database is being developed by Nutrient Data Laboratory (NDL) [Website at

ww.nal.usda.gov/fnic/foodcomp] and will be adapted to support fluoride assessment methodology developed by the Nutrition Coordinating Center (NCC) under the collaborative National Fluoride Database and Intake Assessment Study (NFDIAS). An overview of the sampling, quality control, sample preparation and fluoride assay processes developed for this nationwide study of fluoride (F) concentration and variability in drinking water, commercial beverages, and foods will be presented. Methods and Materials: The study will estimate F concentrations and variability in a U.S. nationwide sampling of bottled and municipal drinking waters, beverages, and foods. This multi-center effort has collected more than 2,000 samples of over 50 foods and beverages at up to 144 locations. Product sampling, purchasing, and review of quality control are being handled by USDA/ARS. Samples have been processed and prepared by Food Analysis Laboratory Control Center Virginia Polytechnic Institute (FALCC-VPI). Analyses are being conducted by University of Iowa using a fluoride ion specific electrode direct read method for analysis of clear liquid samples and a micro-diffusion method for analysis of the remaining food samples. Results: A description of the study protocol and preliminary results are reported. The National Fluoride Database will be released in 2004. Significance: Assessment of F intake is not only critical to ensure adequacy to prevent dental caries, but reliable estimates of F are important to prevent excessive F intake and the resulting dental and skeletal fluorosis. Past F intake research has been hindered by the lack of a database for food and beverage F levels. The National Fluoride Database is critical to dietary F intake assessments supporting grant work for the National Institute of Dental and Craniofacial Research, and the National Heart. Lung, and Blood Institute. Results will assist future research concerning F intake by providing national average F levels and variability in drinking water and many foods and beverages obtained by standardized approaches, allowing quantitative estimates of F intake for individuals.

Beer and Wine

the largest share of the beer market

original 72 counties); samples were

to-size where size=sales from a Trade

state distribution centers in the same vicinit

were used. Information on brands, sales and

fewer samples were needed.

dietary fluoride

Devise and implement a probability-based sampling strategy for U.S. foods and beverages.

Major Tasks for 2002 - 2003

·Almost all of the approximately 2000 samples have been collected according to a self-weighting, nationally representative sampling approach USDA-NDL identified 13 high priority beverages contributing 80% of dietary fluoride consumed in the United States. These include <u>municipal (tap)/drinking</u>

and bottled waters, teas, carbonated beverages, beers, and ready-to drink ices and drinks Also included was brewed tea, which contributes about 25% of total dietary

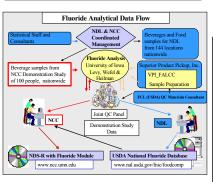
Fusion includes was browed ea, where contributes about 22700 total alcelary fluoride intake. Municipal (tap) water contributes another 23% as an ingredient in processed foods and in recipes. Water as a beverage was projected to surpass tea a a fluoride contributor

Develop a quality control (QC) oversight program and analyze sampled foods under USDA's NFNAP - supervised laboratory contracts and agreement

•The direct reading method was validated using Certified Reference Material (National Institute of Standards and Technology (NIST), a Standard Reference Material (SRM) 2671a, Fluoride in Freeze-Dried Ulrine) and by a comparison of results for several beverage samples between Iowa and the Food Composition Laboratory at USDA.

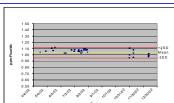
•The micro-diffusion method will be validated by analysis of a Certified Reference faterial (National Research Centre for Certified Reference Materials, Beijing Values for the fluoride content (for example: NIST, SRM 8436, Durum Wheat Flouride Content (for example: NIST, SRM 8436, Durum Wheat Flouride Content (for example: NIST, SRM 8436, Durum Wheat Flouride Content (for example: NIST, SRM 8436, Durum Wheat Flouride Content (for example: NIST, SRM 8436, Durum Wheat Flouride) and STM 1549. Dried Milk Powder), prior to sample analysis

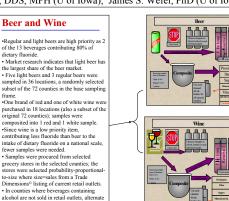
Compile newly generated data to develop a National Fluoride Database to meet requirements for incorporation into food composition data products disseminated by the Nutrient Data laboratory and for incorporation into the NDS-R software



Fluoride Analytical Methodology	Fluoride Q uality Control			
•Direct an alysis for c lear beverages –U sing an Ion Specific Electrode	•Reference materials for direct analysis – NIST Freeze-dried Urine • Two different levels of fluoride – Valuess certified			
• Microdiffusion for solid samples & complex beverages - Tay es. D. R., (1968)	- A queous controlproduced by USDA •Concentration confirmed by			
Separation of fluoride by rapid diffusion using hexamethyldisiloxane. Talanta L5,969-974	four in dependent labs			
	-Freeze-dried Prawn from China •Concentration certified			

Univ. of Iowa Brewed Tea OC Material Results







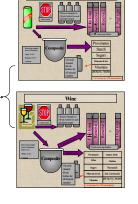
Retail Beverages and Foods

Shipped to U of lows from FALC

 Retail samples of fruit juices, fruit-flavored beverages, carbonated beverages, bottled water, and a limited number of foods were picked un in 36 locations · The assumption that the fluoride variability would be less than in

municipal water was made based on existing data and the results of a water pilot study

· Therefore, a smaller sample size was planned. Individual samples were analyzed (Table 1)



Ready-to-Drink Juices and Fruit Drink

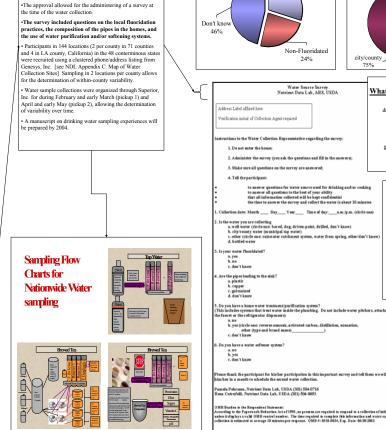
JENIAD

Fiber

Sugars

Minerals

Vitamins



Broad Tan Broad Tan	6. Do you have a water softener system? a. no b. yes					Do You Have A Water Softener System Don't hnow Yes 10% System No 87%	
	mcg/100 g	Number	Standard	Minimum	Maximum	Specific	
	Value	Datapoints	Error	Value	Value	Gravity*	
00% Fruit Juices, all	45	266	1.9	8	153		
Apple Juice, unsweetened	37	110	2.5	8	101	1.046	
Orange Juice, RTD juice box	37	71	3.4	4	141	1.046	
Grape Juice	63	86	4.0	11	170	1.055	
0% Juice Drinks:							
Brand A, all flavors	71	123	2.4	15	108		
Flavor 1	68	31	5.6	15	109	1.043	
Flavor 2	78	29	4.5	16	110	1.046	
Flavor 3	72	31	5.0	16	104	1.045	
Flavor 4	69	32	4.0	16	95	1.048	
Brand B, all flavors	22	56	1.7	6	66		
Flavor 1	19	29	2.1	6	43	1.056	
Flavor 2	25	27	2.7	10	66	1.047	
Data reported in ppm specific gravities determined or data conversion to mcg/100g basis.							