

An Approach to Assessing Dietary Supplement Intake for use in Conjunction with the Collection of 24-hour Dietary Recalls

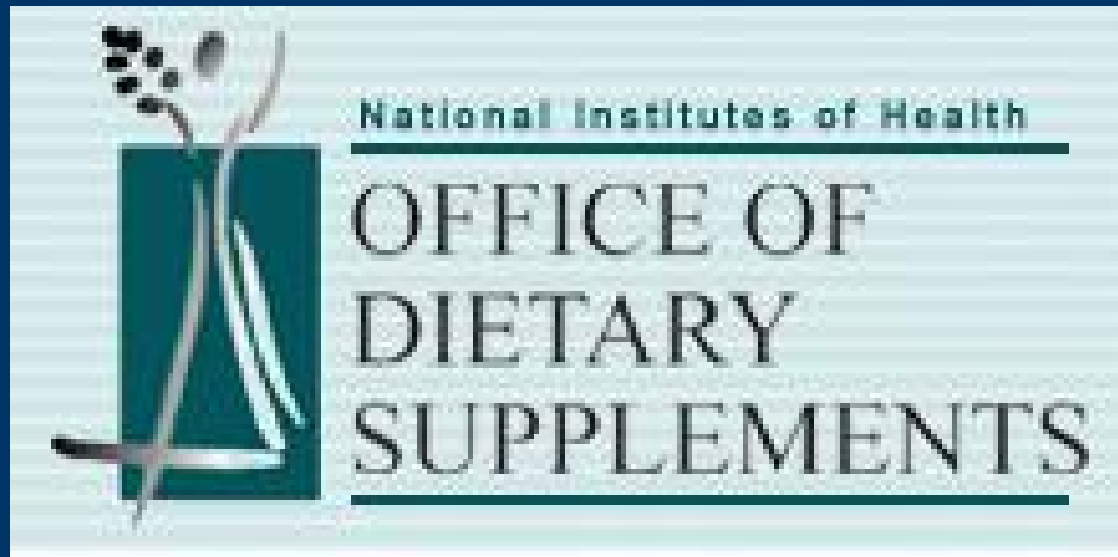
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NDS-R Dietary Supplement Assessment Module (DSAM)

- ❑ Automated collection and coding of dietary supplement use in conjunction with the collection of a 24-hour dietary recall
- ❑ Will be released as part of NDS-R 2007



Acknowledgments



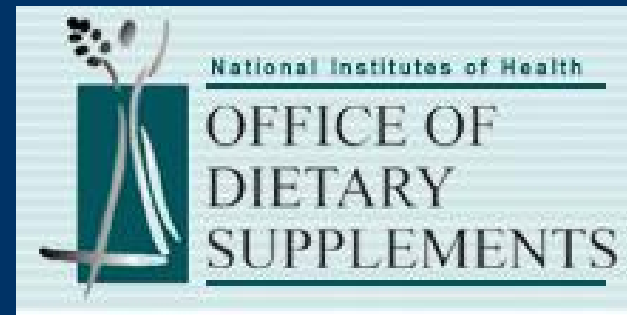
External Advisory Committee

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Dietary Supplement Ingredient Database working group



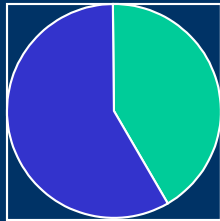


- Facilitates the collection and coding of 24 hour dietary recalls
 - Multiple pass approach
 - Automated coding
 - Etc.

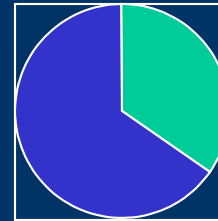


Dietary supplement use among US men and women
aged 40 to 59 years in the INTERMAP study
(Archer et al. JADA, 2005)

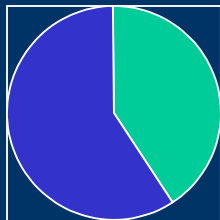
Vitamin C



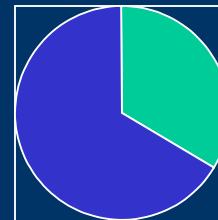
Vitamin A



Vitamin E

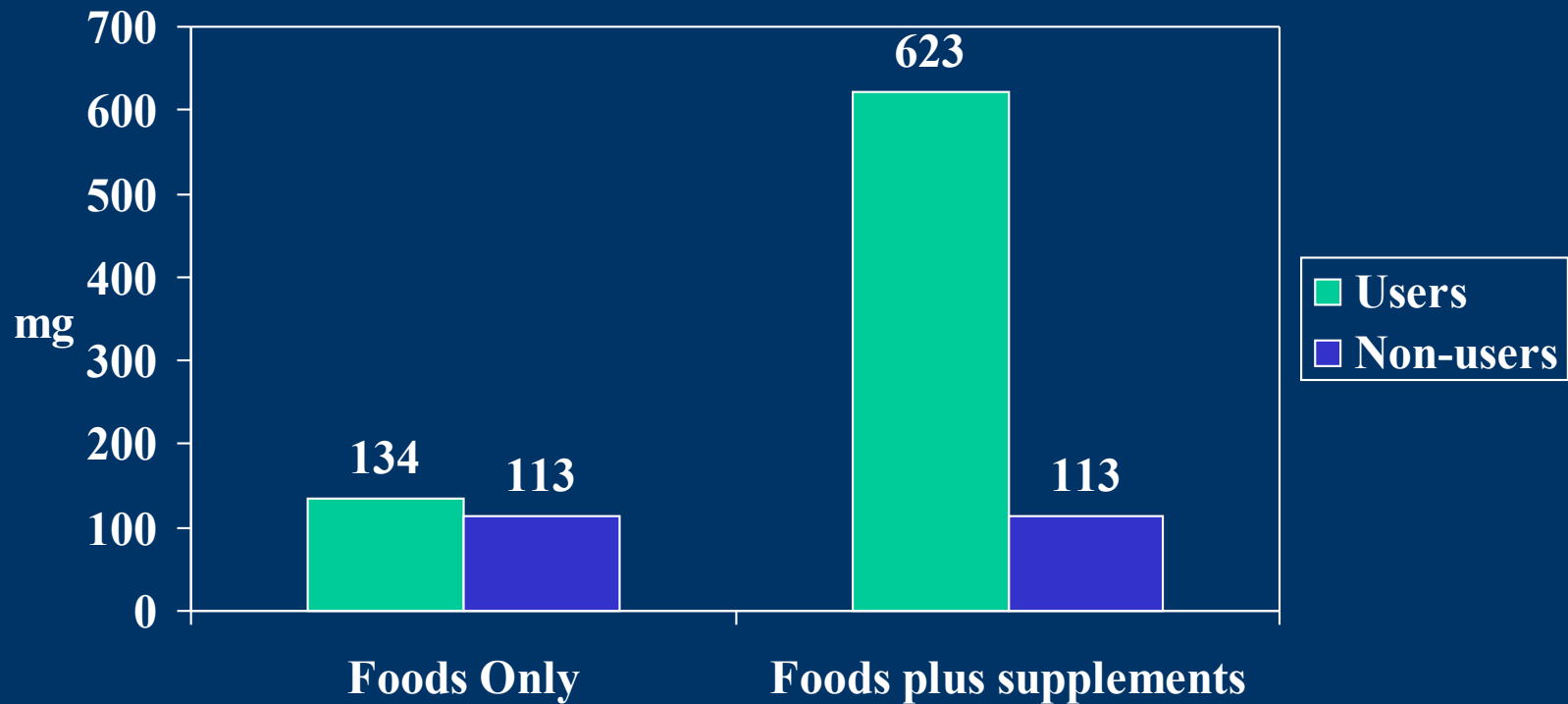


Zinc



 **User**
 **Non-user**

Vitamin C intake per day from foods and foods plus supplements among male users and non-users of vitamin C containing supplements, the INTERMAP study



What approach should we use for assessing dietary supplement use?



Criteria for Assessment Approach

- Able to work with in-person and telephone 24-hour dietary recalls (including unannounced)
- Recall period concurrent with dietary recall period
- Able to assess use of all types of dietary supplements and non-prescription antacids
- Valid

Medication Inventory (Brown Bag)



- Medications brought in by participant
- Product detail recorded (drug name, strength, dosage)
- Amount taken information collected
- Considered gold standard approach in pharmaceutical research

How well might it work for dietary supplement assessment?

- Has been successfully adapted for use by NHANES and others for dietary supplement use assessment
- Validity not well evaluated, but assumed to be good

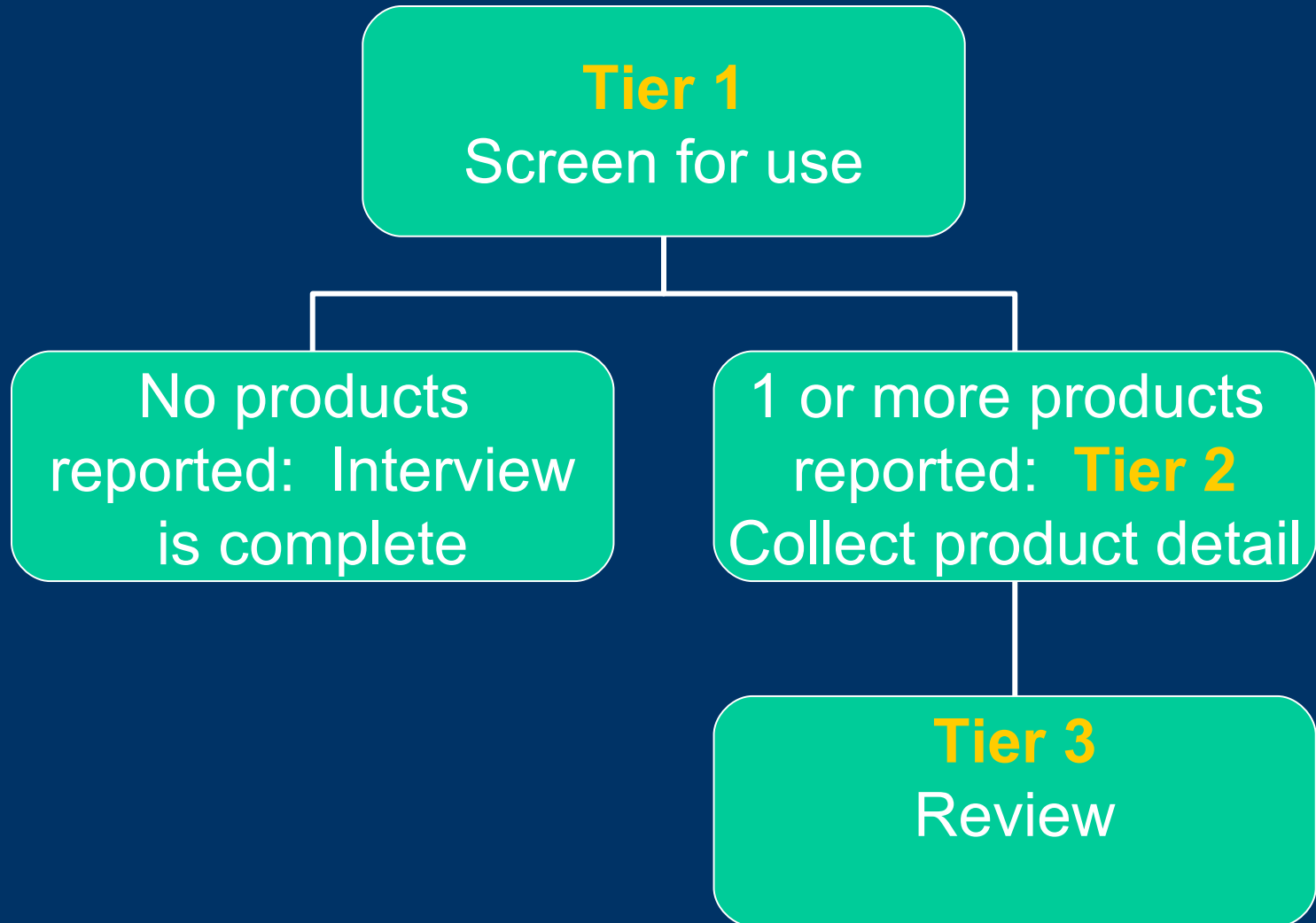
Adaptation for use in conjunction with 24-hour recall

- Collection of supplement use information will follow collection of dietary recall
- Utilize a structured interview process akin to the multiple pass approach

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Tiered 24-hour Dietary Supplement Recall



Tier 1: Screen for use

List Multivitamins Taken

Yesterday did you take any multivitamin or multivitamin with minerals, such as One-a-Day, Theragran, or Centrum?

No

Continue >

Cancel

List Fiber Supplements

Yesterday did you take any fiber supplements, such as Metamucil, Fiberall, or Fibercon?

No

Continue >

Cancel

Screening categories

- Multivitamins
- Individual vitamins
- Individual minerals
- Amino acids
- Fatty acids
- Fiber supplements
- Herbal products
- Others such as glucosamine
- Supplements that are prescribed
- Non-prescription antacids

Tier 2: Product Detail

Collect Supplement Containers

Now I will ask some questions about each of the dietary supplements and over the counter antacid products you took yesterday.

Before I begin collecting this information I'd like you to gather the containers for as many of these products as possible. Are you able or willing to take a few minutes right now to go and get the containers?

Yes

No

Cancel



Product Search



Look at the _____ and read the complete name, including the brand.

Find:

Product Name	Generic
▶ CITRACAL PLUS WITH MAGNESIUM CALCIUM CITRATE VITAMIN D AND MULTI-MINERAL	
CITRACAL PRENATAL RX PRENATAL PRESCRIPTION DUAL IRON WITH ULTRADENSE CALCIUM CITRATE MULTIVITAMINS AND MINERALS	

[Help](#)

[Select Product](#)

[Select Details](#)

[Enter Missing Product](#)

[Cancel](#)



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Product Display



Product name: CITRACAL PLUS WITH MAGNESIUM CALCIUM CITRATE VITAMIN D AND MULTI-MINERAL

Serving size: 2 Tablet

Ingredient	Amount per serving
BORON	1 mg
CALCIUM	500 mg
COPPER	1 mg
MAGNESIUM	80 mg
MANGANESE	1 mg
VITAMIN B-6	10 mg
VITAMIN D	250 IU
ZINC	10 mg

OK



Missing Product Detail: Citracal



Product name:

Brand name:

Manufacturer/distributor:

City name: State:

Contact info:

Product information source:

Serving size quantity: Serving unit:

Nutrients/ingredients listed in the 'Supplement Facts' panel:

Ingredient	Quantity	Unit

Note:

Number of Times Taken Yesterday

How many times did you take this product yesterday?

Continue >

Cancel

Number Taken

How many tablets did you take when you used the product yesterday?

Continue >

Cancel

Place of Purchase

Where did you purchase this product?

Note

Continue >

Cancel

Recommended By

Who recommended this supplement to you?

Note

Continue >

Cancel

Tier 3: Review

MDSR 2006 Nutrition Data System for Research DSAM

File Edit Record View Reports Window Help

Record Information Project: Test, Participant ID: test 1, Date of intake: 09/10/2006

Participant ID	Date of Intake	Date of Entry
▶ test 1	09/10/2006	09/13/2006

Header Food Trailer Dietary Supplements

- ✓ 1. MY FIRST FLINTSTONES CHILDREN'S MULTIVITAMIN
Taken 1 time (1 tablet) yesterday
Why taken: child is a picky eater
Recommended by: Friend or family member
Where purchased: Supermarket/grocery store
Working as wanted: Yes
- ▶ 2. CITRACAL PLUS WITH MAGNESIUM CALCIUM CITRATE VITAMIN D AND MULTI-MIN
Taken 1 time (2 tablets) yesterday
Why taken: bone health
Recommended by: Friend or family member
Where purchased: Supermarket/grocery store
Working as wanted: Yes
[End of Record]

Edit Insert Delete Continue Recall

Ready

Database to Support Module: NHANES Dietary Supplement Database

- Contains dietary supplements and nonprescription antacids reported by participants in the NHANES survey (use of all types of supplements assessed in the survey)
- Label-based database, with information obtained from product labels, manufacturers, and Physician's Desk Reference (PDR)

Assessment Options

- Past day only or past 30 day and past day use may be assessed (user choice)
- Issues surrounding use such as reason for use, place of purchase, etc. may be assessed (optional)
- Products not in the database may be added by the user (user product option)
- Defaults are available for major nutrients and some product types like multivitamins

Demonstration Study

- 100 adults and children who regularly use dietary supplements recruited through community newspapers
- 50 in-person (scheduled) and 50 telephone interviews (unannounced)
- Collect 24-hour dietary recall and supplement use assessment
- Keep track of time required for completion
- Participant and interviewer feedback

Demographic characteristics of participants to date (n=24)

	%	n
Sex		
Female	67.6	16
Male	33.3	8
Race		
White	87.5	21
Non-white	12.5	3

	%	n
Age (years)		
< 19	8.7	2
19-30	13.0	3
31-50	34.8	8
51-70	43.5	10

	%	n
Education level		
H.S. grad or less	8.3	2
Some college, AA	29.2	7
College graduate	62.5	15

Number of dietary supplements reported by participants (n=24)

No. of products	%	n
1	16.7	4
2-3	37.5	9
4-5	20.8	5
6-11	25.0	6

Length of interview in minutes

	Minutes	
	Mean	Range
24-hour recall	19.5	12-37
DSAM	14.0	2-41
Total	33.5	15-78

Any questions unclear or confusing?

All said “no”

Any questions so hard you felt like
you were guessing?

- Perceived effectiveness- don't really know if it's working or not (n=5)
- Length of time taking- felt like I was guessing (n=3)

Other participant feedback

- All but 1 said it was “just the right pace” (1 person said it was “somewhat slow”)
- Most said it was “just the right length” (2 said it was “somewhat short” and 1 said it was “very short”)

Interviewer Perspective

- Overall it works well
- Some questions were too wordy, need to rephrase
- Response options for issues surrounding use questions (e.g. place of purchase) need improvement

Where to from here

- Finish demonstration study
- Refine assessment approach and software in accord with results
- Release software summer 2007
- Ideally validation studies would be conducted to evaluate the Tiered approach

What is a dietary supplement?

“A product (other than tobacco) intended to supplement the diet that bears or contains one or more of the following dietary ingredients: a vitamin, a mineral, an herb or other botanical, an amino acid, or a dietary substance for use by man to supplement the diet by increasing the total dietary intake, or a concentrate, metabolite, constituent, extract, or combination of the above ingredients.”

1994 Dietary Supplement Health and Education Act of 1994

Reason Taken

Why do you take this product?

Continue >

Cancel



Preferences



Method Preferences

Dietary Supplements

Nutrients Per Food

User Preferences

Time period for supplement intake

- 24-hour intake
- 24-hour and past 30 days

Interview type

- Announced/scheduled
- Unannounced/unscheduled

Require additional supplement use questions

- Reason for use
- Recommended by
- Place of purchase
- Perceived effectiveness

Help

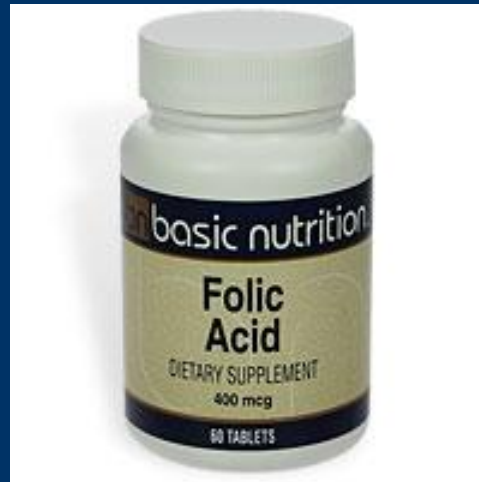
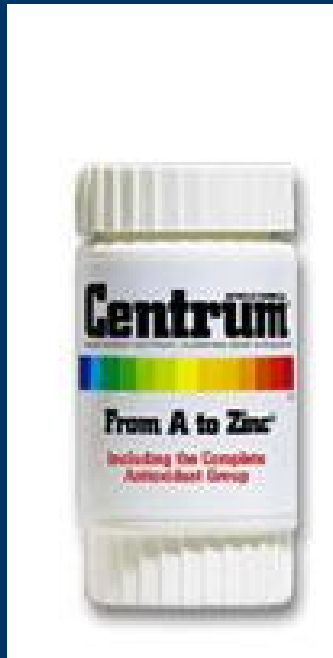
OK

Cancel

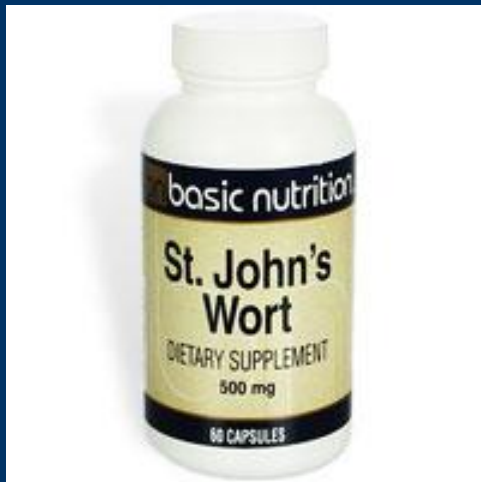
Combination of ingredients



A vitamin or mineral



An herb



An amino acid



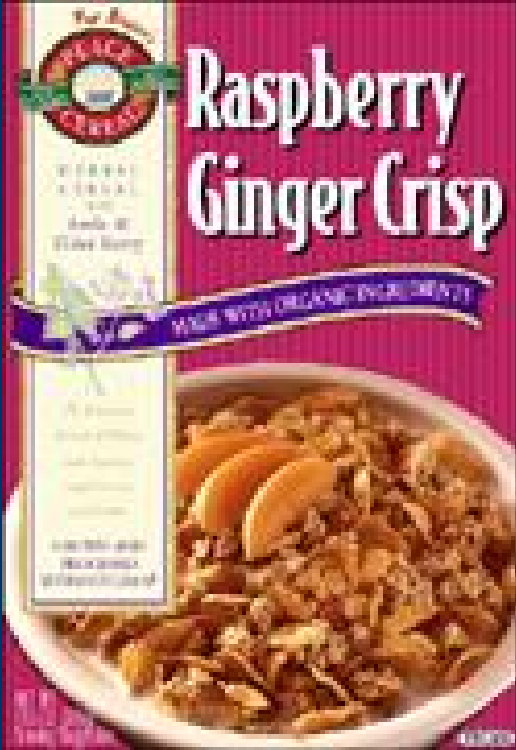
A dietary substance for use by man to supplement the diet by increasing the total dietary intake, or a concentrate, metabolite, constituent, extract

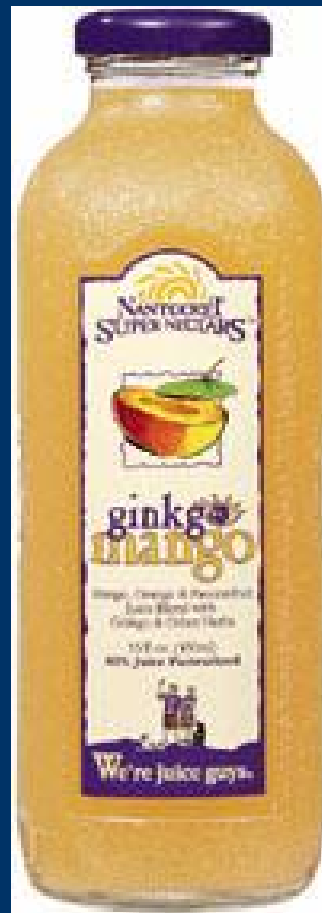


Combination of ingredients



Food and Beverages as Carriers





Ginkgo Mango

Nutrition Facts

Serving Size: 15 FL OZ (450 mL)

Servings per Container: 1

Amount Per Serving

Calories 280 Calories from Fat 0

% Daily Value*

Total Fat 0g 0%

 Saturated Fat 0g 0%

Cholesterol 0mg 0%

Sodium 30mg 1%

Total Carbohydrates 71g 24%

 Dietary Fiber 0g 0%

 Sugars 69g

Protein <1g

Vitamin A 20% Vitamin C 200%

Calcium 2% Iron 4%

* Percent Daily Values based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

Calcium
(mg/day)

Food 961

Suppl. 100

Total 1061



Key Design Features of Module

- Flow seamlessly from last NDS-R dietary recall data entry screen
- Optional rather than mandatory component of NDS-R (user preference)
- Designed for assessment of use of all types of dietary supplements and over the counter antacids

Ingredients

Alfalfa

Alfalfa (aerial)

Alfalfa and stem juice concentrate

Alfalfa dehydrate

Alfalfa extract

Alfalfa juice

Alfalfa juice concentrate

Alfalfa juice powder

Alfalfa leaf powder

Alfalfa powder

Classification

Alfalfa

Ingredient and unit conversions will not be conducted because

- Time required to do so would be significant
- Information is lacking to determine the appropriate conversions for some classes of ingredients (e.g. conversion factors not available for alfalfa)
- Output files will include information that will allow the user to conduct these conversions if they so choose

Coping with product reformulations



Dealing with missing products

- Data entry screen during interview for collecting needed information for resolving missing products (e.g. product name, manufacturer, contact info., etc.)
- User may then find ingredient information for the product and enter it into the database using a supplement addition feature to be included in the DSAM software

Structure and Content of Output Files

- ASCII files with SAS input statements provided for each output file
- Designed to provide nutrient intake estimates in three ways: 1.) from diet only, 2.) from supplements only, and 3.) from both diet and supplements (total)
- Will provide other important supplement use information (e.g. product ID and name, dosage, etc.)

Directed Recall Approach

Over the past 12 months how often did you take Beta-carotene (NOT as part of a multivitamin)?

- o Never
- o Less than 1 day per month
- o 1-3 days per month
- o 1-3 days per week
- o 4-6 days per week
- o Everyday

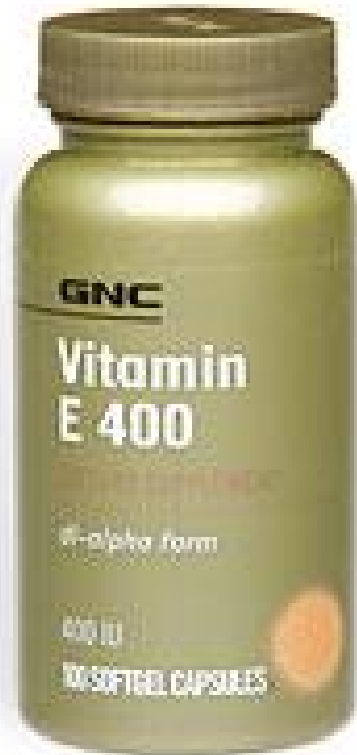
When you took Beta-carotene, about how much did you take in one day?

- o Less than 10,000 IU
- o 10,000-14,999 IU
- o 15,000-19,999 IU
- o 20,000-24,999 IU
- o 25,000 IU or more
- o Don't know

Strengths

- Could be adapted for past day
- Relatively quick and easy for participants assuming a limited number of nutrients are asked about (e.g. multivitamins and some individual vitamins and minerals)
- Quick and easy from a nutrient calculation standpoint
- Results from validation studies suggest this approach has some merit

Reporting dosage a challenge



Knowledge of ingredients may be limited



Limited number of nutrients assessed

