

# Sources of Food Composition Data and Considerations for Use

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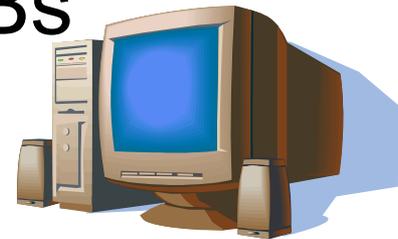
# Presentation Outline

- Sources and Uses
  - US government databases (DBs)
  - DB directories and other sources
- Factors Affecting Use
  - Food names/descriptors
  - Food component variation



# US Gov Electronic DBs

- Nutrient DB for Standard Reference (SR)
- Special Interest DBs
- Food and Nutrient DB for Dietary Studies
- Dietary Supplement (DS) DBs
- Total Diet Study DB



# Nutrient DB for SR, Release 18

- Maintained/updated by ARS
- $\leq 125$  food components for 6,661 foods
- Reference use in the office with other professionals, patients, students, clients
- <http://www.nal.usda.gov/fnic/foodcomp/search/>



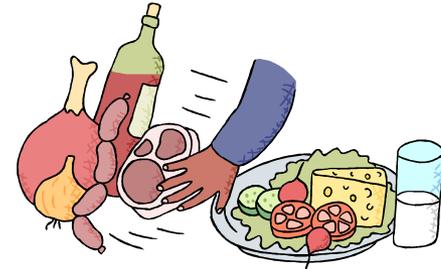
# ARS Special Interest DBs



- Added sugars, choline, flavonoids, fluoride, isoflavones, proanthocyanidins, oxalic acid
- Calculated; collaborations with academia; culled from the literature
- May later be incorporated into SR
- <http://www.ars.usda.gov/Services/docs.htm?docid=5121>

# Food and Nutrient DB for Dietary Studies (FNDDS)

- Used for NHANES
- 61 food components for 7,000 foods
- No missing values
- Updated as needed
- Foods “as consumed” and “as described” by survey participants
- <http://www.ars.usda.gov/Services/docs.htm?docid=7673>



# FNDDS-Related DBs

- DB of Vitamin A (mcg RAE) and Vitamin E (mg AT) for NHANES  
(<http://www.ars.usda.gov/Services/docs.htm?docid=12088>)



- What's In the Foods You Eat Search Tool  
(<http://www.ars.usda.gov/Services/docs.htm?docid=7783>)  
13,000 foods in typical portion sizes



# Dietary Supplement (DS) DBs

- NCHS DS DB for NHANES
- ODS working on label-based DS DB
- ODS/ARS working on analytically-based DS DB



- [http://dietary-supplements.info.nih.gov/Health\\_Information/Dietary\\_supplement\\_Ingredient\\_and\\_Labeling\\_Databases.aspx](http://dietary-supplements.info.nih.gov/Health_Information/Dietary_supplement_Ingredient_and_Labeling_Databases.aspx)

# FDA Total Diet Study DB

- Monitors food safety & nutritional quality
- 280 core foods analyzed for: minerals, folic acid, heavy metals, radionuclides, pesticide residues, industrial chemicals, other contaminants
- Estimates intakes for 8 age-sex groups
- <http://www.cfsan.fda.gov/~comm/tds-toc.html>



# DB Directories

- NNDC Intl Nutrient Databank Directory  
2004 ed:12 DBs, 26 software vendors

(<http://www.nal.usda.gov/fnic/foodcomp/conf/>)



- INFOODS Intl Food Composition Tables  
Directory: organized by 8 geographic  
regions

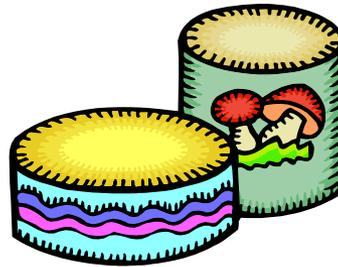
([http://www.fao.org/infoods/directory\\_en.stm](http://www.fao.org/infoods/directory_en.stm))



# Food Industry Data

- Label data (amounts; %DVs per serving)
- Websites for companies and restaurants
- U NB-Lincoln Coop Ext, Lancaster County

<http://lancaster.unl.edu/food/ciq-contacts.htm>

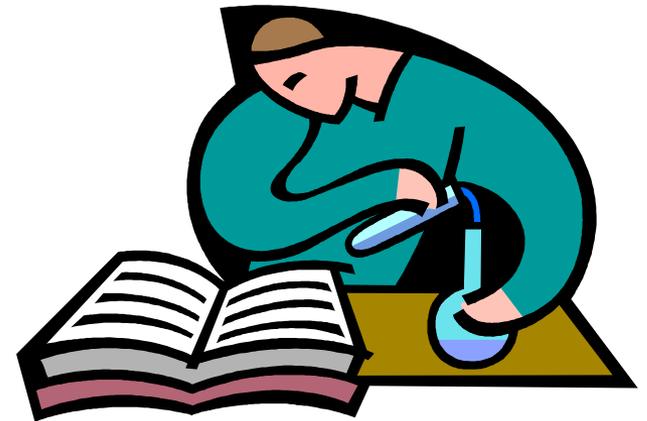


# Scientific Literature

- J Food Composition and Analysis  
home for NNDC and IFDC papers

[http://www.elsevier.com/wps/find/journaldescription.cws\\_home/622878/description](http://www.elsevier.com/wps/find/journaldescription.cws_home/622878/description)

- J Medicinal Foods
- J American Diet Assn
- J Nutrition



# DB Use

- 1) Need data for a specific food
- 2) Try to find food name and descriptors in DB
- 3) Try to make best match between “our” food and the DB listings



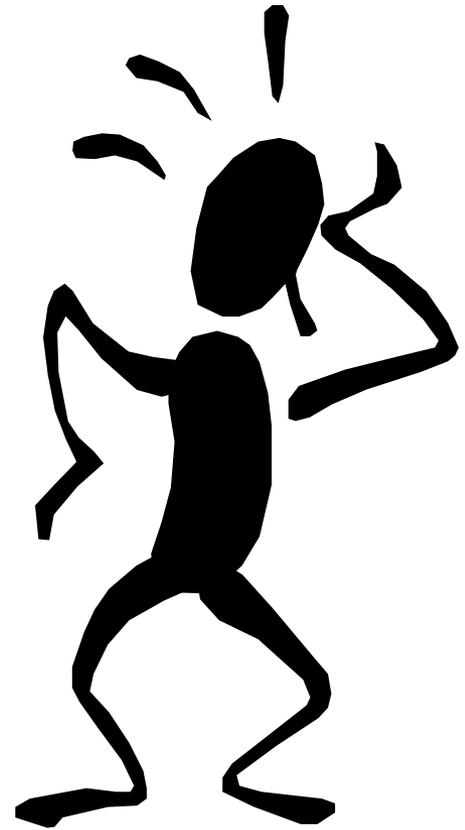
# Primary Problems Using DBs

- (1) Food we want isn't listed
- (2) Too many choices for the food we want
- (3) Finally find the food, but the data we need are missing



# Food Name Issues

- 1 name, but 2 or more meanings
- Unclear descriptors
- Food name synonyms
- Food name misnomers



# The Pomegranate by Ogden Nash



The hardest fruit upon this planet  
Is easily the ripe pomegranate.  
I'm halfway through the puzzle game  
Of guessing how it got its name.  
The pome part turns my cowlick hoary,  
But the granite is self-explanatory.

# Food names with more than 1 meaning

- Biscuit
- Calabash
- Chili
- Flan
- Jelly
- Kummel
- Marrow
- Melt
- Parfait



- Pepper
- Prairie oyster
- Rape
- Snowball
- Squash
- Sweetbread
- Tortilla
- Truffle
- Twister

# The Sweetbread by O Nash

That sweetbread gazing up at me

Is not what it purports to be.

Says Webster in one paragraph,

It is the pancreas of a calf.

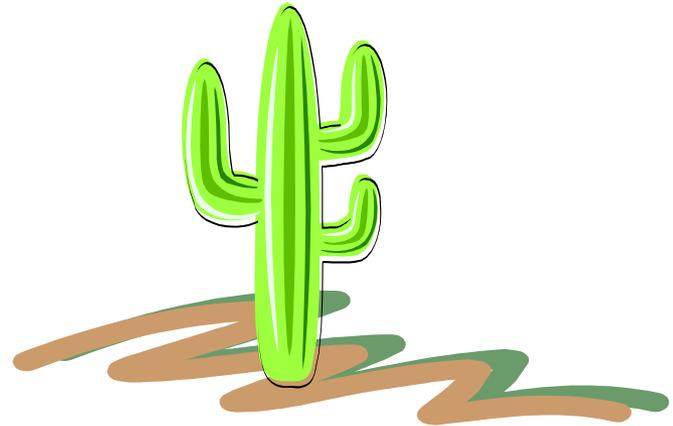
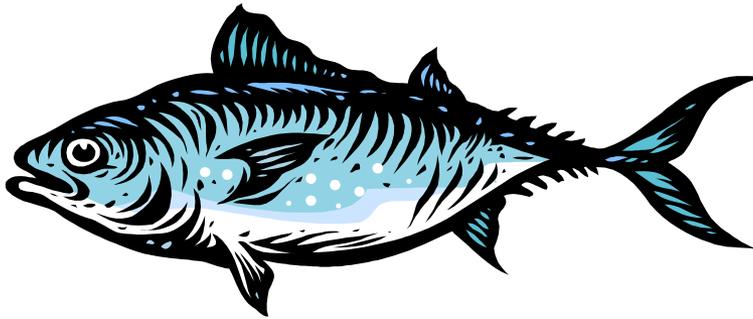
Since it is neither sweet nor bread,

I think I'll take a bun instead.



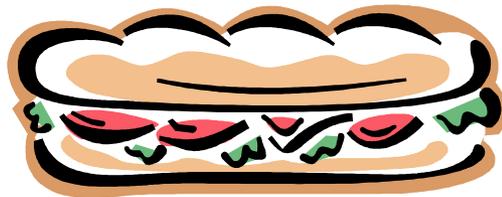
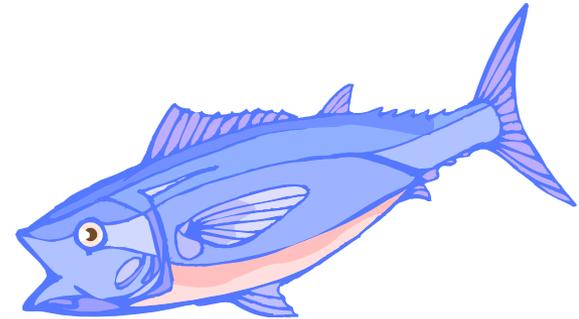
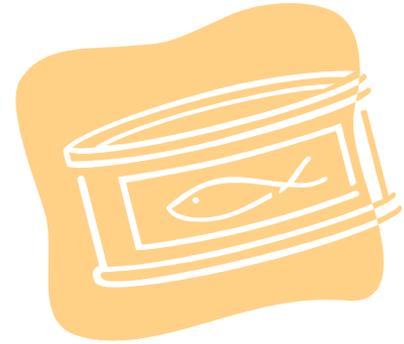
# Tuna – 2 primary foods

- US saltwater fish
- Mexican prickly pear (cactus fruit)



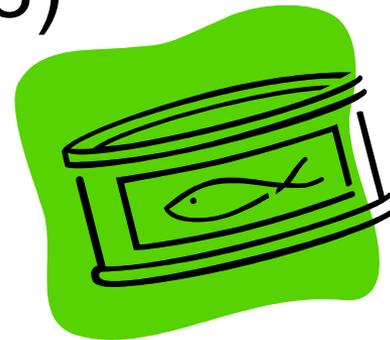
# Search of SR18 for “Tuna”

- 16 items containing “tuna”
- 8 for canned tuna
- 6 for fresh tuna
  - Bluefin, skipjack, yellowfin
  - Raw; cooked by dry heat
- 1 tuna salad; 1 sub with tuna salad



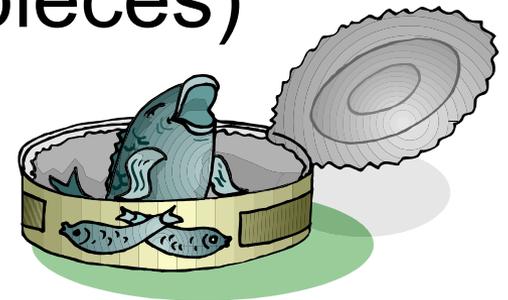
# Canned Tuna – SR18 Descriptors

- Canned in oil (4) vs. canned in water (4)
- Light (4) vs. white (4)
- Without salt (4)
- Assumes drained solids (8)



# Tuna – current market descriptors

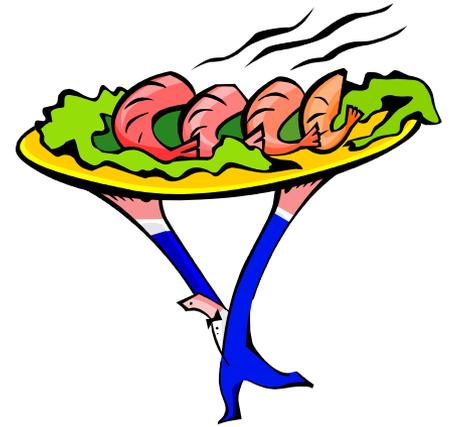
- Canned in specialty oils
- Tuna/tuna fillets in pouches; tuna fillets in cans
- Solid (loin portion) vs. chunk (pieces)
- Examples:
  - Solid white albacore in pouch
  - Low sodium chunk light in sunflower oil



# Food Name Synonyms

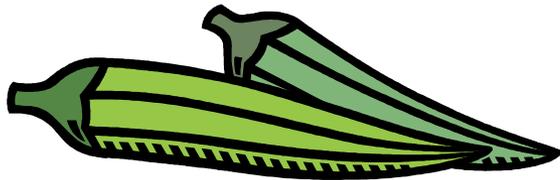
Avanti, Gourmetti! By O Nash

Sea horses may be Romanized  
By calling them hippocampi;  
If you would do the same to shrimp,  
Add garlic and they're scampi.

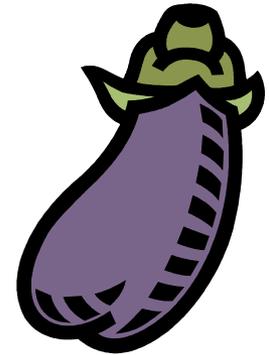


# Food Name Synonyms

- Balsam pear
- Broccoli rabb
- Cilantro
- Eggplant
- Jerusalem artichoke
- Kiwifruit
- Okra

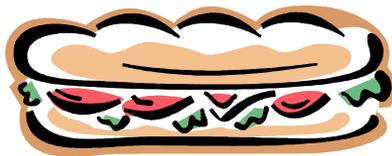


- Bitter melon
- Rapini
- Coriander
- Aubergine
- Sunchoke
- Chinese gooseberry
- Lady finger, gumbo



# Food Names with Several Synonyms

- Carbonated water=soda water, soda, club soda, seltzer, seltzer water
- Hoagie=torpedo, submarine, sub, grinder, hero, Italian sandwich/sub, poor boy
- Pancake=flapjack, hotcake
- Snap bean=string bean, wax bean, green bean, French green bean



# Misnomers: Sweet Potato vs. Yam

- Sweet potato (*Ipomoea batatas*); raised in the southern US; orange in color; high in beta-carotene
- Yam (*Dioscorea alata, D sativa*); raised in the tropics and Asia; white in color; high in starch



# Misnomers: Chicory vs. Endive

- Chicory (*Chichorium intybus*)
  - small, yellow/red, tightly packed leaves
  - syn. Belgian/French endive, radicchio, witloof
- Endive (*Cichorium endivia*)
  - salad greens
  - includes curly endive (lacy leaves) and escarole (broad leaves)



# Food Misnomers

Yorkshire Pudding by O Nash

Let us call Yorkshire pudding

A fortunate blunder;

It's sort of popover

That tripped and popped under.



# Food Component Variation



- Inherent (genetic)
- Environmental (weather, geography, etc.)
- Processing (industry processing, home cooking)
- Analytical (sample design, sample preparation, analytical method)



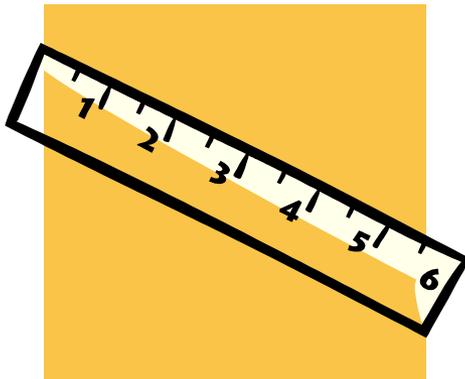
# Time of Day

- Significant circadian variation in fat content of breast milk; higher content in evening.  
(Lubetzky et al, *J Am Col Nutr* 25:151-154, 2006)



# Height of Plant

- Vitamin C decreased while carotenoids, beta-carotene, chlorophylls, and polyphenols increased with height in dill plants (Lisiewska et al, *J Food Comp Anal* 19:134-140, 2006)



# Season

- Cherry tomatoes of same cultivar, under similar conditions in same location, showed marked differences in antioxidant content based on harvest time; lycopene lowest in mid-summer

(Raffo et al. *J Food Comp Anal* 19:11-19, 2006)



# Variety/Cultivar

- Phenolic acid of 15 varieties of beans varied from 19.1 (cranberry) to 48.3 (navy and black) mg/100g dry beans (Luthria and Pastor-Corrales. *J Food Comp Anal* 19:205-211, 2006)



# DB Uses



- SR: Office reference, professional needs, patient/client care, student instruction
- FNDDS: National, regional, local dietary surveys; assessing student diets
- Restricted diets: more precise data from food companies
- Research/clinical studies: lab analyses

# Parting Thought

- Food composition data are approximations
- Dietary advice based on food composition should consider variation vs. practicality
- Rigid dietary recommendations may override dietary variety

