



FDA/NSTA Web Seminar:
Teach Science Concepts and Inquiry
with Food: Focus on Salt

Wednesday, April 9, 2008

Salt: History, Health Issues, and U.S. Regulatory Policies



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Topics Covered

- Salt “defined”
 - What is salt? Where is it found? How is it made?
- Brief discussion of salt’s history
- Salt and Health
- FDA activities related to salt





Salt “defined”:

What is salt?

Where is it found?

How is it made?





Salt: Definitions

- What is salt?

1.

Use the “hand-raise” button to volunteer to answer this question.





Salt Definition

- NaCl (table salt)
 - Ionic combination of the cation (Na^+) and anion (Cl^-).

-or-

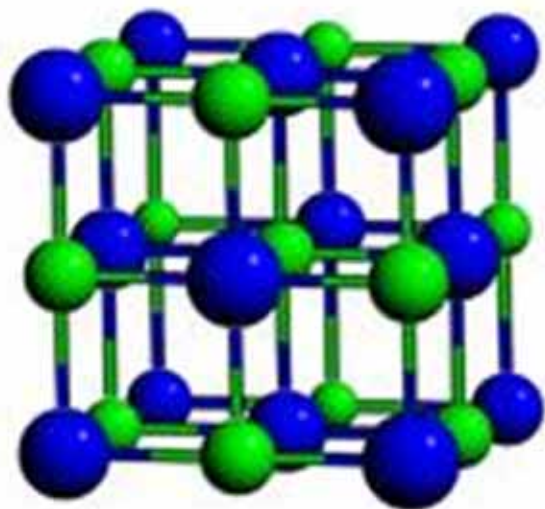
- Chemical definition: Any combination of an acid and base resulting in formation of an ionic compound (examples KCl, KBr, NaSO_4 , etc.)





Salt

- Salt exists in nature as a cubic crystal (halite).



Images from: U.S. Naval Research Laboratory, US Geologic Survey



Salt in Nature

- Salt is found naturally in seawater (around 3%)
- In mineral deposits (halite)
- In natural bodies of water (lakes, streams)





Salt Production

- Salt can be mined from underground deposits, either by rock salt mining or vacuum evaporation.
- It can be evaporated from seawater (sea salt, fleur de sel) or other bodies of water.
- Varying particle size depending on use.
- Additives (potassium iodide, anti-caking agents)





Let's Pause for Two Questions
from the Audience





The History of Salt and Salt and Health





History of Salt

- Used in foods throughout and before history.
- Politically and economically important in human history.
- Scarce in most areas until recently and important as a traded commodity – also used as currency.

Source: *Salt: A World History*, Kurlansky, M., 2002.





History of Salt



Question: Which word we use today was derived in part from forms of the word “salt” in other languages?

- A. Salad
- B. Soldier
- C. Salary
- D. Salacious
- E. All of the above





Salt and Health

- Sodium is necessary for life
 - Important for osmoregulation – maintaining “water balance”
 - Nerve transduction and other biological functions.
- Human body contains about 250 grams of salt (3 or 4 full salt shakers)

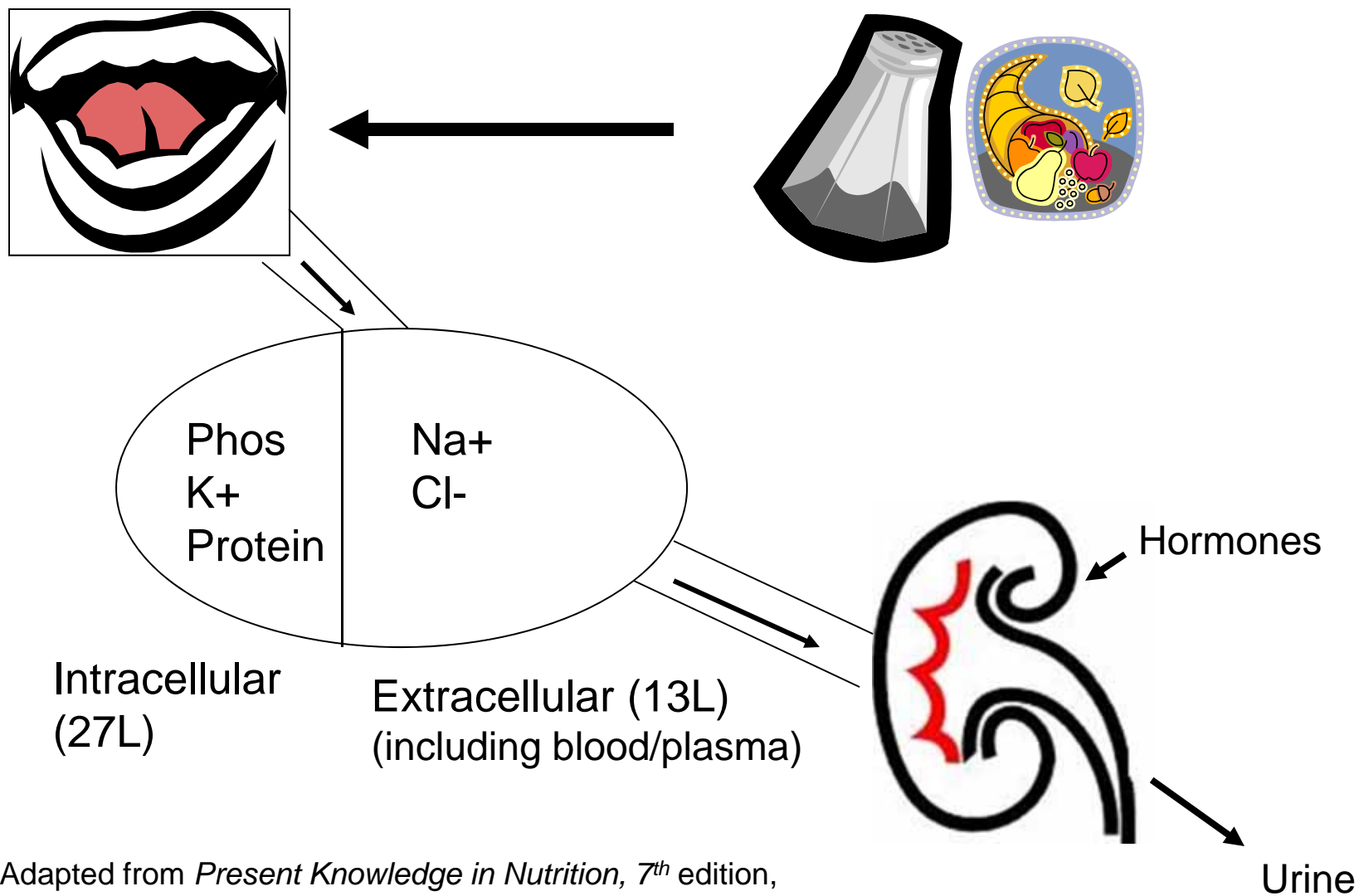




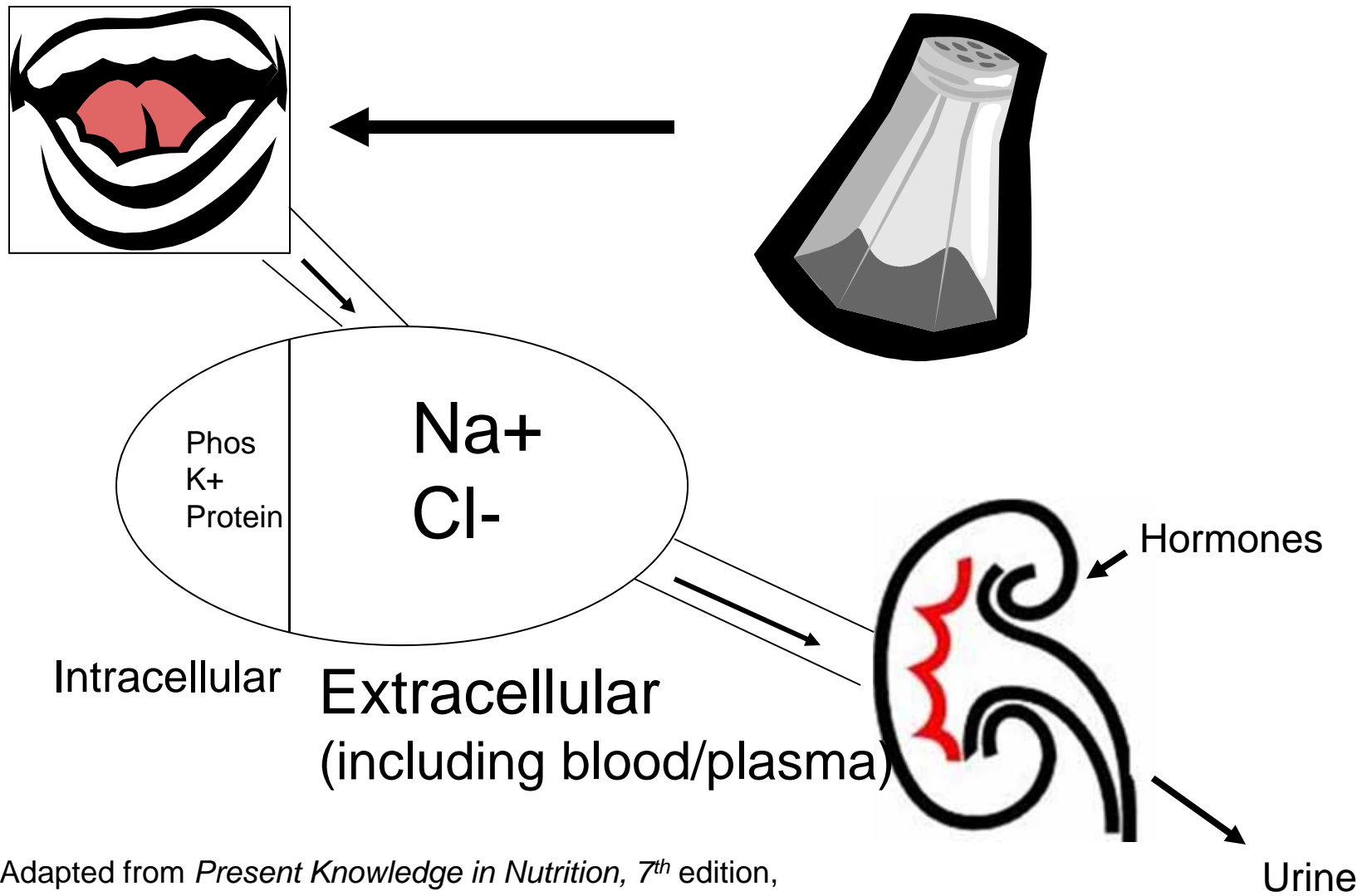
Salt and Blood Pressure

- Blood pressure rises with salt intake in most people. Blood pressure is strongly associated with heart disease and stroke.
- The body tends to keep salt in the body, likely because it is necessary for life and was often scarce in the prehistoric diet.
- Excess salt in the diet causes water retention and excess fluid can be a cause of the rise in blood pressure.





Adapted from *Present Knowledge in Nutrition*, 7th edition,
Ziegler and Filer eds. 1995.



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Ziegler and Filer eds. 1995.



Salt sensitivity

- Blood pressure response to salt in the diet isn't uniformly consistent.
- Certain populations seem to be more sensitive to salt.
- Who are usually more sensitive?

African Americans	Middle-aged or older adults
Those who already have hypertension	All three answers are correct



Recommendations for sodium intake

- Current Dietary Guidelines (2005)
 - Consume no more than 2,300 milligrams of sodium per day.
 - African Americans, hypertensives, middle-aged consume no more than 1,500 milligrams





How much sodium are Americans consuming

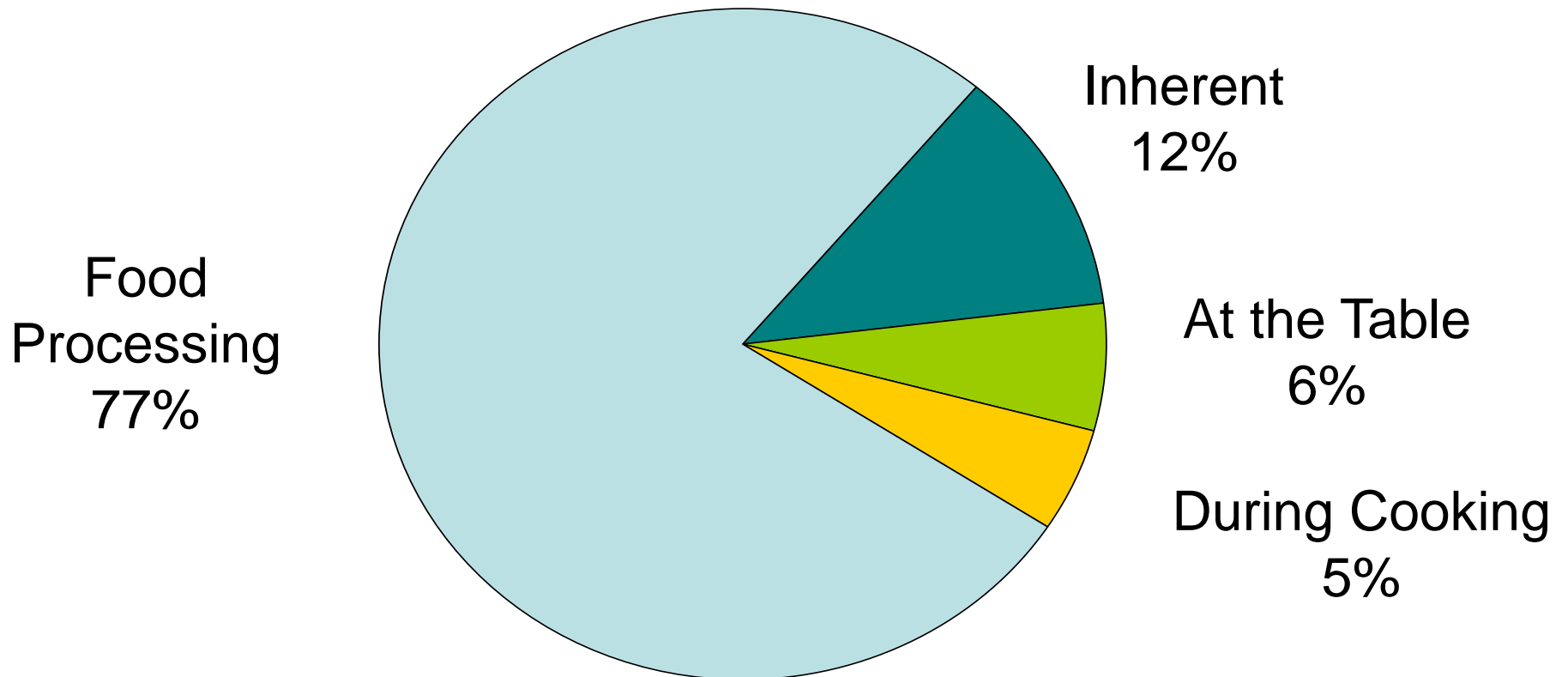
- Sodium intake data:
NHANES consumption data (3,400 mg/d , 1999-2000)
- Sodium excretion studies: 4,000 mg/d (Zhou et al., 2003 INTERMAP)





Sources of Dietary Sodium

(62 adults who completed 7 day dietary records)



Mattes and Donnelly, JACN, 1991; 10: 383 – From a presentation given by Dr. Lawrence Appel to FDA on November 29, 2007.



What functions does salt serve in food?

- Preservative (reduces water activity and thus spoilage microorganisms)
- “Processing Aid” in breadmaking, cheesemaking, other fermented foods.
- Taste – the primary reason. We have an innate preference for salty foods.





Which food contains more salt ?

A. Cereal “toasted O”- shaped (1 cup)	B. Potato chips (1 small bag)
C. Peanut Butter (2 tbsp)	D. Ranch Salad Dressing (2 tbsp)



Salt content of common foods

- A. Cereal “O”s w/no milk(1 cup) – 190 mg
- B. Potato chips (1 small bag) – 95 mg
- C. Peanut Butter (2 tbsp) – 150 mg
- D. Ranch salad dressing (2 tbsp) – 325 mg**

Other foods: Canned soups: 480 – 1000 mg
Frozen dinners: 1000-2000 mg
Cheese: 200 mg/ounce

Source: My cupboard and USDA nutrient database:
<http://www.nal.usda.gov/fnic/foodcomp/search>



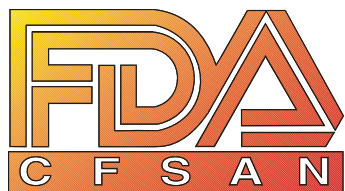


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FDA Activities Related to Salt





FDA Activities Related to Salt

- Salt is considered to be “Generally Recognized as Safe” or “GRAS” without express limits on use.
- FDA primarily activities regarding salt/sodium has been primarily labeling-based.
- Sodium declaration is required on packaged foods as part of the “Nutrition Facts Panel”





Nutrition Facts

Nutrition Facts	
Serving Size 1 cup (236ml)	
Servings Per Container 1	
Amount Per Serving	
Calories 80	Calories from Fat 0
% Daily Value*	
Total Fat 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol Less than 5mg	0%
Sodium 120mg	5%
Total Carbohydrate 11g	4%
Dietary Fiber 0g	0%
Sugars 11g	
Protein 9g	17%
Vitamin A 10% • Vitamin C 4%	
Calcium 30% • Iron 0% • Vitamin D 25%	
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:	

- Sodium will be declared on the Nutrition Facts Panel
- Other sodium labeling:
 - “Healthy” (requires less sodium)
 - Definitions for “low”, “reduced”, “no”, sodium label claims.





Food Labeling



- For more information about how to read food labels, see our “Labelman” webpage.
- www.cfsan.fda.gov/labelman.html





Citizen Petition and Public Hearing

- Revoke GRAS status for added salt and require manufacturers to reduce salt in processed foods
- Require labeling on packages of salt larger than ½ ounce
- Reduce the Daily Value (DV) on nutrition labels from 2,400 mg/d to 1,500 mg/d





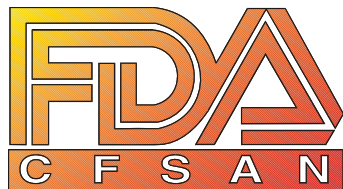
Public Hearing

- FDA held a public hearing November 29, 2007, to discuss regulatory policies for salt and sodium and to discuss proposals in the citizen petition.
- FDA is reviewing comments received and will ultimately respond to the original citizen petition.





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Thanks to our presenter,
Richard Bonnette, and to
the FDA



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