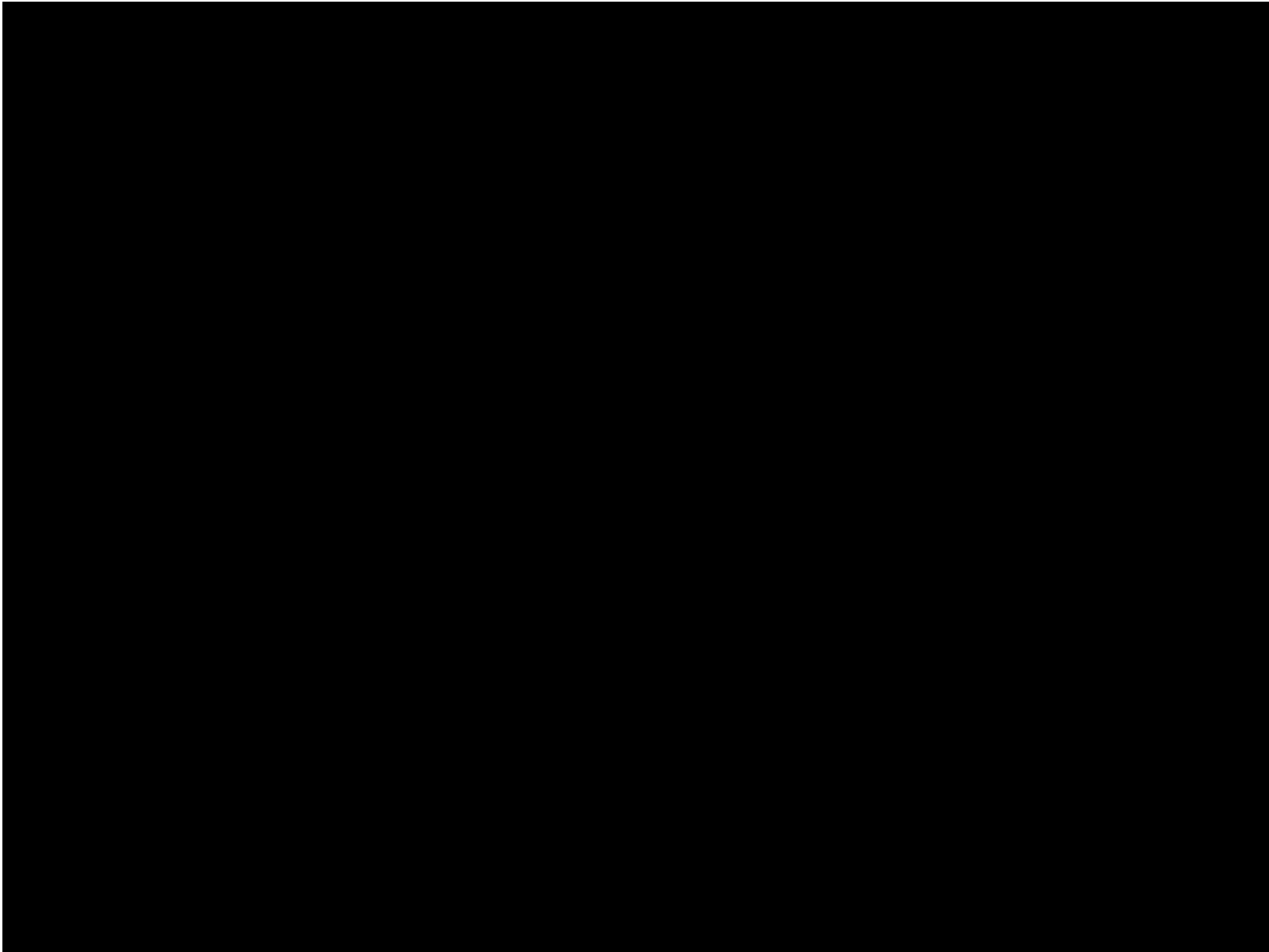


Dietary salt and high blood pressure





What does salt have?

- Sodium chloride

What role does sodium play in your body?

- Essential element for normal body function
- Maintains fluid balance

What happens if you eat excess salt?

- Body holds too much water
- Blood volume increases
- Heart works harder
- Blood pressure is increased

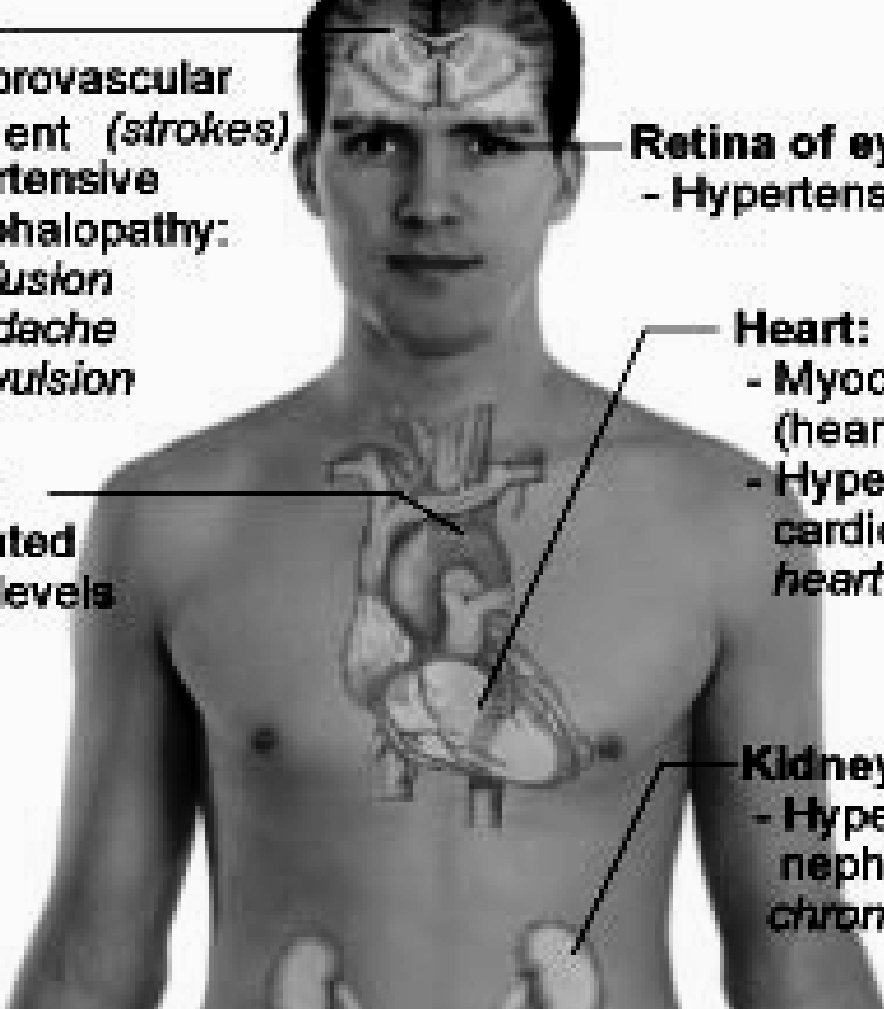
What is normal blood pressure?

JNC 7- Classification of blood pressure for adults

Blood Pressure Classification	SBP in mm Hg	DBP in mm Hg
Normal	< 120	< 80
PreHypertension	120–139	or 80–89
Stage 1 Hypertension	140-159	or 90-99
Stage 2 Hypertension	≥ 160	≥ 100

SBP, systolic blood pressure; DBP, diastolic blood pressure

What happens if you have high blood pressure?

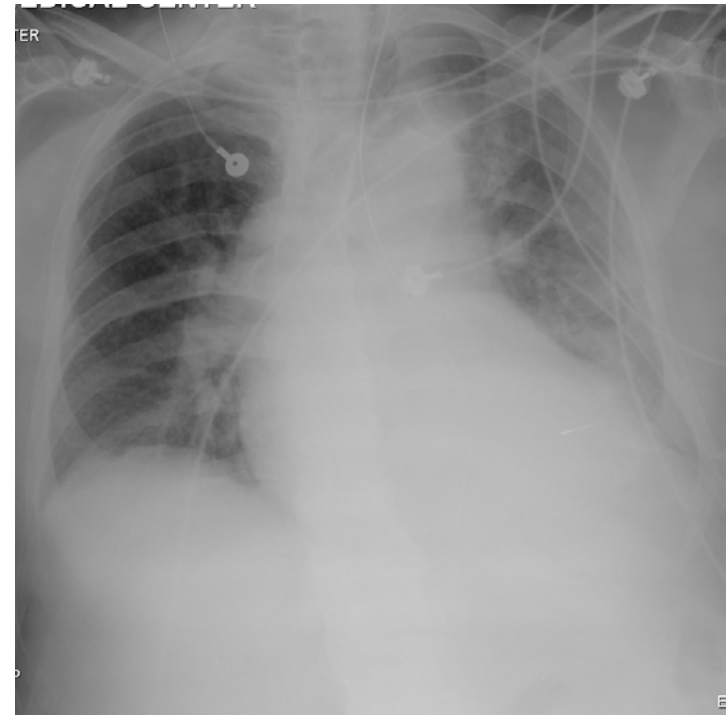
- **Brain:**
 - Cerebrovascular accident (*strokes*)
 - Hypertensive encephalopathy:
 - *confusion*
 - *headache*
 - *convulsion*
 - Blood:**
 - Elevated sugar levels
 - Retina of eye:**
 - Hypertensive retinopathy
 - Heart:**
 - Myocardial infarction (*heart attack*)
 - Hypertensive cardiomyopathy:
 - *heart failure*
 - Kidneys:**
 - Hypertensive nephropathy:
 - *chronic renal failure*
- 

What happens if your heart works harder?

- Heart thickens and enlarges
- Increases the risk of heart attack or heart failure



Normal heart



Congestive heart failure

Relationship between salt intake and thickness of the heart

↑ salt intake = ↑ heart thickness

Schmieder et al., Dietary salt intake. A determinant of cardiac involvement in essential hypertension. Circulation. 1988;78:951-6.



Brain hemorrhage

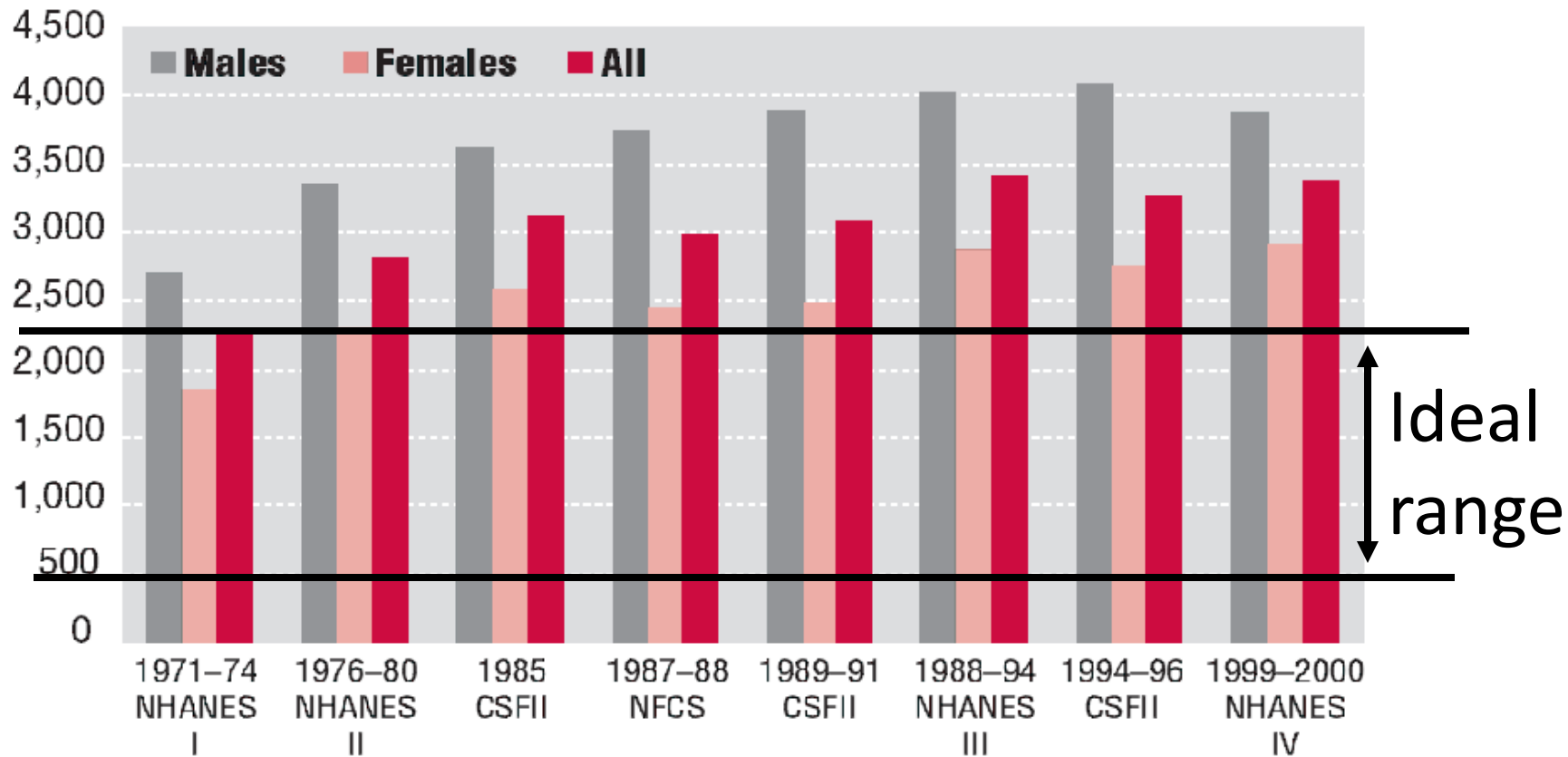


How much sodium can you eat in a day?

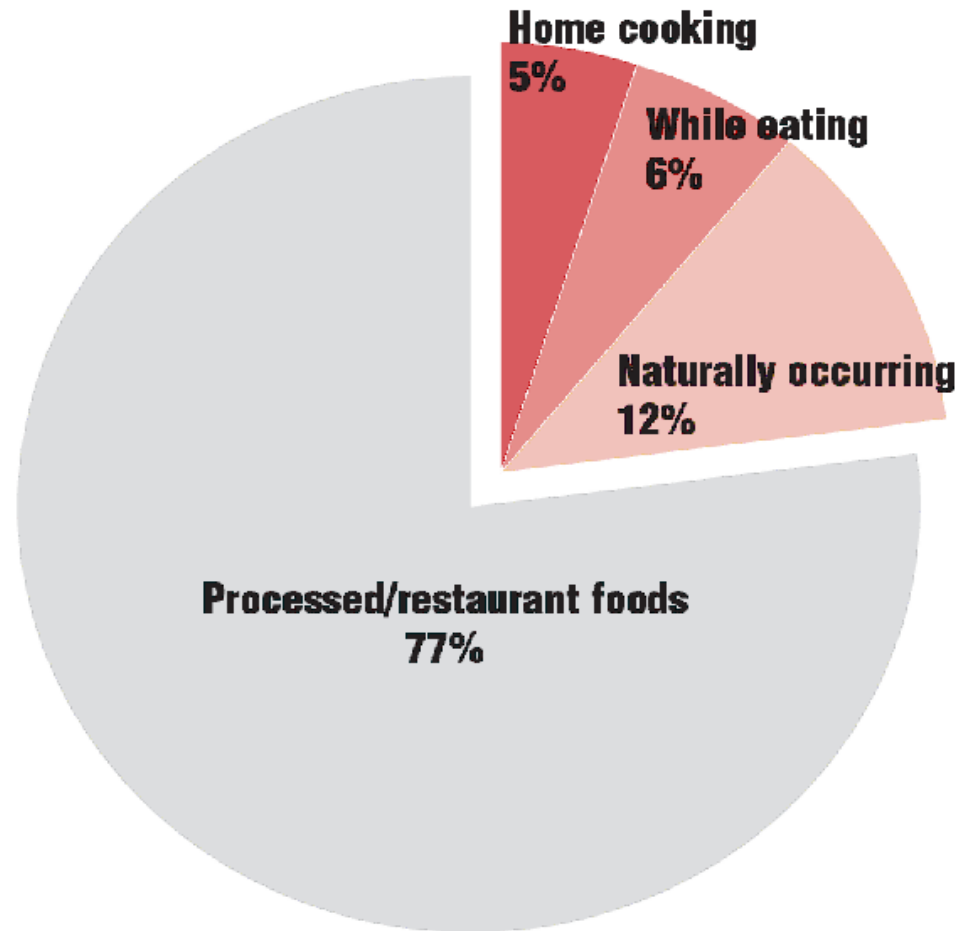


How much sodium does an average American eat in a day?

Americans' average sodium consumption (mg/day), based on dietary-recall surveys



What are the sources of sodium in your diet?



75% of dietary sodium is added during processing and manufacturing

What is the largest source of sodium in your diet?

Table salt



How much is a 2-gm sodium diet?



- 2 gm = 2000 mg
- One level teaspoon of salt = 2,300 mg of sodium ✓

Sodium content in popular fast food

KFC famous bowls rice and gravy	2690
KFC famous bowls mashed potato with gravy	2260
Popcorn chicken value box	1900
EC thigh value box	1670
Chicken pot pie	1760
Fiery buffalo hot wings value box	1580
Boneless HBQQ wing (1)	340
Country fried rice without peppered gravy	1040
Macaroni and cheese	880
Sara lee Pecan –pie slice	460



Sodium content in popular fast food

Spicy tenders (3 pieces)	2160
Crispy chicken sandwich	1690
Mild tenders (3 pieces)	1620
Chicken breast (1)	1130
Spicy chicken strips (skinless with breading) (2)	820
Chicken bowl	1600
Loaded chicken wrap	1100
Grilled chicken sandwich	978
Chicken biscuit	930
Chicken etouffee	870
Red beans and rice	710
French fries	660



Big breakfast	1920
Grilled Chicken club sandwich	1690
Quarter pounder with cheese	1330
Double cheese burger	1140
Big Mac/ Big N tasty with cheese	1010
Sausage biscuit	990
Egg McMuffin	860
Mc Chicken	810
Filet of Fish	660
Large French fries	330



Sodium content in restaurant meals

- Red Lobster's: Admiral's Feast (4,662 mg) + caesar salad dressing (930 mg) + creamy lobster topped mashed potatoes (1,110 mg) + cheddar bay biscuit (350 mg) + lemonade (54 mg) = **7,106 mg**
- Chili's: Buffalo chicken fajitas with tortillas and condiments (6,846 mg) + Dr. Pepper (70) = **6,916 mg**
- Olive Garden: Tour of Italy lasagna (3,830 mg) + breadstick (350 mg) + garden fresh salad with house dressing (1,990 mg) + Coca Cola (6 mg) = **6,176 mg**

What are some hidden sources of sodium?

- Condiments Do Count

- Ketchup (1 tbsp) = 178 mg
- Sweet relish (1 tbsp) = 121mg
- Capers (1 tbsp) = 255 mg
- Soy sauce (1 tbsp) = 980 mg
- pickles, olives, ketchup, salsa, ajinomoto



- Sauces (marinara/tomato, BBQ, alfredo)
- Soup / broth/ salad dressing /appetizers
- Blackening seasoning
- Cheese/ casseroles
- Salted French fries, onion rings, mashed potatoes

Sodium content in bottled beverages (8 fl oz)

Coca Cola classic and caffeine free	35
Diet Coke	35
Dr Pepper	35
Ginger Ale	38
Mountain Dew	50
Mountain Dew Code Red	110
Red Bull	200
Sierra Mist	35

High sodium offenders

Watch for sodium containing preservatives

Ingredients:

Water, Enriched Flour (wheat flour, niacin, iron, thiamine, riboflavin, folic acid), Processed American Cheese (cheese [pasteurized milk, cheese cultures, **salt**, enzymes, calcium chloride], water, cream, **sodium citrate [emulsifier], salt, annatto**), Dehydrated Potatoes (potatoes, mono & diglycerides, **sodium acid pyrophosphate, citric acid**), Margarine (partially hydrogenated and fully refined soybean oil, water, **salt**, vegetable mono&diglycerides, lecithin, **sodium benzoate**, artificially flavored, colored with beta carotene [a source of Vitamin A], Vitamin A palmitate added), Dehydrated Cheese (cheddar cheese [pasteurized milk, cheese cultures, **salt**, enzymes], maltodextrin, whey, **salt, disodium phosphate**)

Canned vegetables/soups

Ready to eat cereals

Frozen dinners

Packaged deli meats

Soy/pasta sauce

Bottled vegetable juices

Snack foods

What can you eat on a 2300 mg sodium diet?



Sodium occurs naturally in fruits, vegetables, cereals and pulses, almost all food items



Sodium content in popular vegetables

Vegetables	Cals	Sodium in mg	Potassium in mg
Cucumber (3.5 oz)	10	0	140
Sweet corn (3.2 oz)	90	0	250
Tomato (5.3 oz)	110	0	620
Potato (5.3 OZ)	25	20	340
Bell pepper (5.3 oz)	25	40	220
Carrot (2.8 oz)	30	60	250
Broccoli (5.3 oz)	45	80	460
Celery (4.0 oz)	15	115	260

Sodium content in Milk products

Margarine	0-105
Butter	55
Ricotta cheese	50-70
Swiss cheese	74
Soy milk	85
Milk	130
Cream cheese	135-84
Blue cheese	396
Cottage	360-430
American cheese	406
Parmesan	454

Sodium content in Seafood

Fish (3 oz) raw, not processed	Sodium in mg
Tuna	34
Catfish	51
Cod	59
Salmon	63
Trout	40-69
Shrimp	119
Scallop	217
Coleslaw (3.5 OZ)	267
Crab	619
Calamari (fried)	2330

Healthy choice - Fruits

Fruits	Cals	Sodium in mg	Potassium in mg
Banana (4.5 oz)	110	0	450
Lemon (2 oz)	15	0	75
Orange (5.5 oz)	80	0	250
Cherries (5 oz)	100	0	350
Pineapple (4 oz)	50	10	120
Grapes (4.5 oz)	90	15	240
Cantaloupe(4.8 oz)	50	20	240
Honeydew (4.8 oz)	50	30	210

Sodium content in meat and poultry

Chicken = 230 mg
(4 oz)

Fish=76 mg
(4 oz)

Eggs= 94 mg



Meat (4 oz)

Lamb= 95 mg

Beef= 71 mg

Pork= 208 mg

Milk (8 oz)= 130 mg

Cheese (1 oz)= 50-500 mg



How to get your daily salt intake to 2300 mg sodium?

- Eat whole/fresh foods as close to natural as possible
- Put away the salt shaker or add salt where it is needed the most
- Taste substitution with other flavoring agents or herbs

How to get your daily salt intake to 2300 mg sodium?

- Learn to read food labels
- Opt for low sodium products or recipes when eating at restaurants
- Prefer fresh simple boiled, charbroiled or grilled items over pan-roasted or fried items
- Rinse canned or frozen vegetables/fruits before eating

Learn to read food labels

“Spot the Block”

Standardized
by the U.S.
government's
National
Labeling and
Education Act
(NLEA)



One slice of
cheese = 276
mg of sodium



Ingredients: Potatoes, Sunflower Oil and/or Corn Oil, and Salt.
No Preservatives.

Nutrition Facts	
Serving Size 1 oz.	
Amount Per Serving	
Calories 150	Calories from Fat 90
% Daily Value*	
Total Fat 10g	16%
Saturated Fat 1g	6%
Polyunsaturated Fat 4.5g	
Monounsaturated Fat 4.5g	
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 180mg	7%
Potassium 330mg	9%
Total Carbohydrate 15g	5%
Dietary Fiber 1g	4%
Sugars 0g	
Protein 2g	
Vitamin A 0%	Vitamin C 10%
Calcium 0%	Iron 2%
Vitamin E 6%	Thiamin 2%
Niacin 6%	Vitamin B ₆ 4%
Phosphorus 4%	Magnesium 4%
* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:	
	Calories: 2,000 2,500
Total Fat	Less than 65g 80g
Sat Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Potassium	3,500mg 3,500mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g
Calories per gram:	
Fat 9	Carbohydrate 4 • Protein 4

1 oz of lays classic
= 180 mg of sodium

Keep a tab on the serving size

Watch serving size

3 pierogies = 550 mg of sodium

1 box or 12 pierogies
= 550 X 4 = 2200 mg of sodium

Nutrition Facts

Serving Size 3 Pierogies (114g)
Servings Per Container 4

Amount Per Serving

Calories 200 **Calories from Fat** 50

% Daily Value*

Total Fat 6g **9%**

Saturated Fat 3g **15%**

Trans Fat 0g

Cholesterol 15mg **5%**

Sodium 550mg **23%**

Total Carbohydrate 30g **10%**

Dietary Fiber 1g **4%**

Sugars 1g

Protein 7g

Vitamin A 2% • Vitamin C 8%

Calcium 8% • Iron 8%

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

		Calories	2,000	2,500
Total Fat	Less Than	65g	80g	
Saturated Fat	Less Than	20g	25g	
Cholesterol	Less Than	300mg	300 mg	
Sodium	Less Than	2,400mg	2,400mg	
Total Carbohydrate		300g	375g	
Dietary Fiber		25g	30g	

Calories per gram:

Fat 9 • Carbohydrate 4 • Protein 4

NO MORE SODIUM FOR THE DAY!

Put away the salt shaker



Add salt
only once



Commercially available processed foods based on sodium content

Listing on the package	Sodium content per serving
Sodium free	< 5 mg
Very low sodium	<35 mg
Low sodium	< 140 mg
Reduced sodium	25% less sodium in each serving
Light in sodium	50% less in each serving
Unsalted/No added salt	No salt added during processing
Lightly salted	50 % less sodium added during processing besides the natural sodium content

Salt substitutes - Rediscover the natural taste of foods

Use fresh or dried herbs and spices to flavor foods

onion, garlic, ginger, lemon juice, vinegar, black pepper/fresh pepper, dill, sage, cinnamon, rosemary, basil, thyme, parsley

Be careful with salt substitutes

contain potassium

could be harmful if you have heart or kidney problems

maintains your taste for salt



Eat as close to natural as possible

- Steamed vegetable
- Fresh fruits and nuts
- Non-cured or fresh meats, low sodium canned tuna or salmon
- Low sodium or home made dressings (lemon juice, vinegar and olive oil)
- Unsalted butter
- Frozen dinners with less than 500-800 mg of sodium

Better menu choices at restaurants

- Choose broiled, baked, steamed, or grilled foods– not fried
- Prepare dish without salt and get sauces and dressings on the side or not at all
- Ask to box up half of your meal before it's served
- Avoid salted bread, spiced, smoked, pickled, meat pies, luncheon meats or breaded frozen meats



Practice portion control

One serving of fresh fruit is about the size of your fist

A serving of cooked vegetables, rice, or pasta should fit in your cupped hand

