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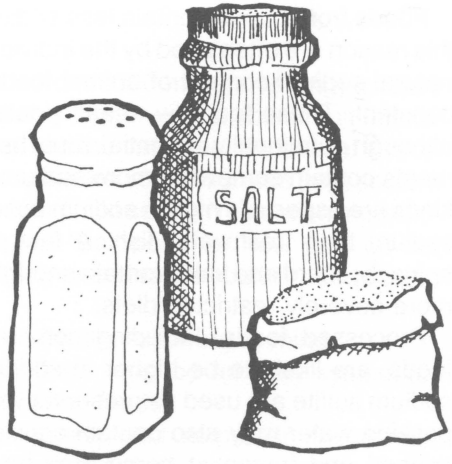


The Sodium-Restricted Diet

TEXAS AGRICULTURAL EXTENSION SERVICE
THE TEXAS A&M UNIVERSITY SYSTEM
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ACKNOWLEDGMENT

The Texas Agricultural Extension Service is grateful to the Cooperative Extension Service, Oklahoma State University, for granting permission to reprint this publication for use in Texas.



The value of salt has long been known. Feuds and wars were waged for the possession of salt during man's early development. The common expressions "salt of the earth" and "worth his weight in salt" all show the high value placed on salt. Taxes were collected for possession of salt. Even the word "salary" is connected with salt.

Salt remains valuable to us as a source of sodium, an essential nutrient needed by our body to function properly. The body needs sodium to form tissue — to aid a child's growth, to heal a wound or to develop the fetus during pregnancy.

Sodium is found mostly in body fluids surrounding the cells. Its chief purpose is to regulate the amount of fluid in the body and the location of that fluid. The body stores extra sodium in the bone for future use. Sodium also plays a part in the transmission of nerve impulses within our body and in the regular beating of the heart.

Dietary deficiency of sodium probably never occurs as we generally eat more sodium than necessary. It is found in almost all foods but in varying concentrations. These differences depend on the particular food, climate and soil conditions.

Water varies in its sodium content from one area to another, depending on the minerals in the soil and rocks and on the minerals used in softening waters. The sodium content of local water supplies is available from the State Health Department in Austin.

Table salt, the most common seasoning, probably contributes the greatest amount of sodium to the American diet. Table salt is sodium chloride (NaCl); approximately 40 percent of ordinary table salt is sodium.

Foods from plants contain less sodium than foods from animals and for this reason are often used by the individual on a sodium-restricted diet. The natural sodium content of animal foods is relatively high and reasonably constant. These foods — meat, poultry, fish, eggs, milk and cheese — although nutritionally essential, must be used in measured amounts. Organ meats contain somewhat more sodium than muscle meats. Shellfish of all kinds are especially high in sodium but other saltwater fish contain no more sodium than freshwater fish. A few plant foods, especially greens like spinach, chard and kale, contain enough sodium that they are omitted in the more severely restricted diets.

Processed foods, including commercially canned, frozen and cured foods, are likely to be higher in sodium since sodium products such as sodium sulfite are used as preservatives, flavorings and as other aids. The packing water may also contain considerable amounts of sodium. Foods canned and frozen at home may be prepared with distilled water and without salt to aid in low-sodium diets.

Why Sodium Restriction?

Under certain conditions, the body retains sodium from the foods eaten. This sodium holds fluids in the body. As a result, edema or swelling (retention of fluid) occurs, especially in the ankles, fingers and under the eyes. This edema is undesirable since it puts extra work on the heart, is cosmetically unbecoming, adds pounds and tends to reduce the normal flow of blood.

One way to remove this excess fluid from the body is to restrict the sodium intake in the diet. Sodium-restricted diets are commonly used to treat a number of disease states associated with sodium retention, such as hypertension, cardiac failure, nephrosis, cirrhosis and toxemia of pregnancy.

In a sodium-restricted diet, natural foods, food products and liquids containing significant amounts of sodium are either omitted or restricted to limited amounts. As nearly as possible, other nutrients needed for normal nutrition are provided. Such a diet should be prescribed by a doctor, never by the individual.

Sometimes a physician prescribes both a sodium-restricted diet and a diuretic. A diuretic is a drug used to rid the body of excess sodium and water. When certain diuretics are used, the doctor may suggest including foods in the diet which are high in potassium but low in sodium. This is to counteract the diuretic's side-effect of washing out the body's potassium supply.

The Sodium-Restricted Diet

The normal daily intake of sodium is from 3000 milligrams (mg) to 6000 milligrams (mg) but may be considerably higher with a liberal salt intake. The sodium-restricted diet should be prescribed at a specific level of intake. Commonly-used levels outside the hospital are 500 milligrams (mg) sodium restriction; 1000 mg sodium restriction and mild sodium restriction (approximately 3000 mg). The terms "salt-free," "salt poor" or "low salt" do not provide enough information to adequately describe the sodium needs of the body.

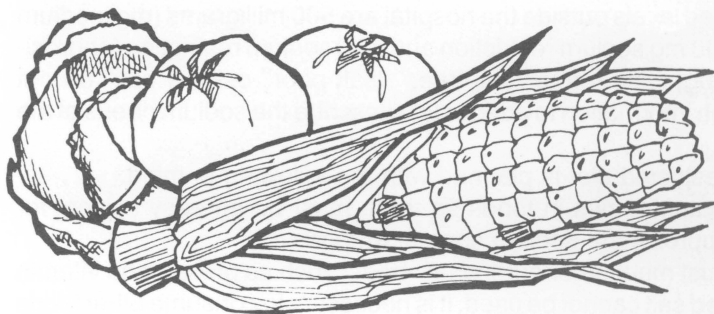
A sodium-restricted diet is planned with the following in mind:

1. Sodium content varies in foods so there must be an easy system for recognizing approximate sodium content in foods.
2. The diet must meet other nutritional needs, such as protein and vitamin A. Since iodized salt cannot be used, it is necessary to consume other foods rich in iodine.
3. The diet must include as wide a variety of foods as possible.

In order to roughly calculate the sodium found naturally in foods, a joint committee of the American Dietetic Association, the American Heart Association and the United States Public Health Service grouped foods for sodium-restricted diets into **unit lists**. Dividing foods into such units helps assure the doctor, dietitian or individual that the sodium content will be controlled and the diet nutritionally adequate. The units are similar to the exchange lists used for the diabetic.

Food List	Amount	Sodium Content in mg.
1. Milk, whole	1 cup, regular	120
2. Vegetables	1 cup, low-sodium	7
Group A	½ cup	9
Group B	½ cup	9
Group C	varies with selection	5
3. Fruits	varies with selection	2
4. Low-sodium breads, cereals	varies with selection	5
5. Meat, poultry, fish, eggs or cheese	1 oz. meat or equivalent	25
6. Fats	1 tsp. butter or equivalent	trace

Foods grouped together in the unit lists have similar sodium content. They also have similar protein, carbohydrate, fat and calorie values.



VEGETABLES

Use only fresh, frozen or dietetic canned vegetables

Group A

One unit (½ cup serving) 9 mg sodium; negligible calories

Asparagus	Mushrooms
Broccoli	Okra
Brussels sprouts	Peppers, green or red
Cabbage	Radishes
Cauliflower	Squash, summer (yellow, zucchini, etc.)
Chicory	Tomato juice (low-sodium dietetic)
Cucumber	Tomatoes
Endive	Turnip greens
Escarole	Wax beans
Green beans	
Lettuce	

Group B

One unit (½ cup serving) 9 mg sodium; 35 calories

- Onions
- Peas (fresh or low-sodium dietetic canned)
- Pumpkin
- Rutabaga (yellow turnip)
- Squash, winter (acorn, butternut, Hubbard, etc.)

Group C

One unit 5 mg. sodium; 70 calories

Beans (dried), lima or navy	1/2 cup cooked
Beans, (fresh), lima	1/3 cup cooked
Beans, baked (no pork)	1/4 cup
Corn	1/3 cup or 1/2 small ear
Lentils, dried	1/2 cup cooked
Parsnips	2/3 cup
Peas, split green or yellow, cowpeas	1/2 cup cooked 1 small or 1/2 cup mashed
Potato, white	1/2 small
Potato, sweet	

Substitutions

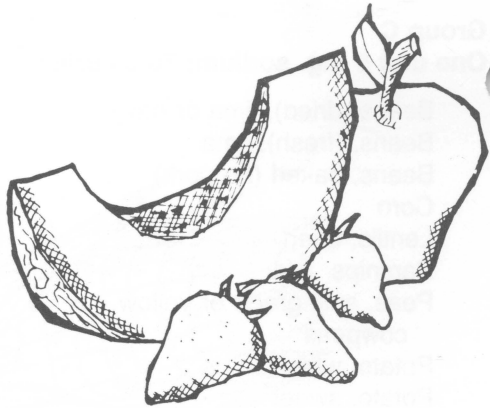
*Two units of Group A vegetables may be substituted for one unit from Group B.

*One unit from the bread list may be substituted for one unit of Group C vegetables. If fresh, frozen or dietetic canned vegetables are used, the sodium content per serving is between 5-9 mg. If regular canned vegetables are used, the average sodium content per serving is 50 mg per serving.

AVOID

Canned vegetables or juices except low-sodium dietetic

Beets, beet greens
Canned vegetables except
dietetic
Carrots
Celery
Chard, Swiss
Dandelion greens
Kale
Lima beans, frozen (if
processed with salt)
Mustard greens
Potato chips
Sauerkraut



FRUITS

One unit fruit 2 mg sodium, 40 calories

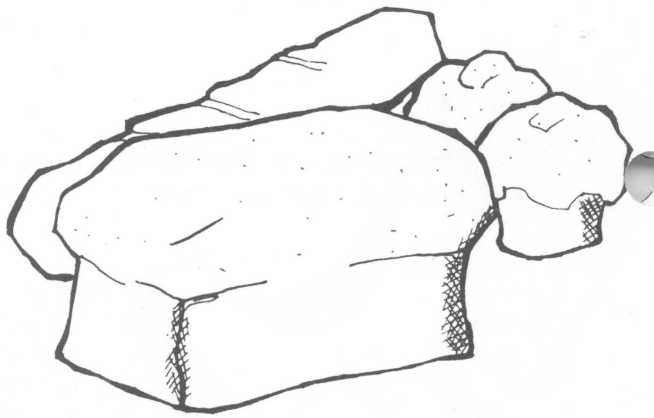
Unsweetened: fresh, frozen, canned or dried

Apple	1 small
Apple juice, cider	1/3 cup
Applesauce	1/2 cup
Apricots, dried	4 halves
Apricots, fresh	2 medium
Apricot nectar	1/4 cup
Banana	1/2 small
Blackberries	1 cup
Blueberries	2/3 cup
Cantaloupe	1/4 small
Cherries	10 large
Cranberries, sweetened	1 tablespoon
Cranberries, unsweetened	use as desired
Cranberry juice	use as desired
Dates	2
Fig	1 medium
Fruit cup or mixed fruit	1/2 cup
Grapefruit	1/2 small
Grapefruit juice	1/2 cup
Honeydew melon	1/8 medium
Lemons, fresh and juices	use as desired
Limes, fresh and juices	use as desired
Mango	1/2 small
Orange	1 small
Orange juice	1/2 cup
Papaya	1/3 medium

Peach	1 medium
Pear	1 small
Pineapple, sliced	2 slices
Pineapple, diced	½ cup
Pineapple juice	⅓ cup
Plums	2 medium
Prunes	2 medium
Prune juice	¼ cup
Raisins	2 tablespoons
Rhubarb, sweetened	2 tablespoons
Rhubarb, unsweetened	use as desired
Strawberries	1 cup
Tangerine	1 large
Tangerine juice	½ cup
Watermelon	1 cup

AVOID

- Crystallized or glazed fruit
- Maraschino cherries
- Dried fruit with sodium sulfite added



BREADS

Group A

Yeast breads and rolls without salt

One unit 5 mg sodium, 70 calories

Bread	1 slice
Melba toast, unsalted	4 pieces (3½" x 1½" x ⅛")
Roll	1 medium

Group B

Quick breads made with sodium-free baking powder or potassium bicarbonate and without salt; or made from low-sodium dietetic mixes

Biscuit	1 medium
Corn bread	1 cube (1½")
Griddle cakes	2 3" cakes
Muffin	1 medium

Group C

Cereals, cooked, unsalted

Farina	½ cup cooked
Grits	½ cup cooked
Oatmeal	½ cup cooked
Rolled wheat	½ cup cooked
Wheat meal	½ cup cooked

Group D

Cereals, dry

Puffed Rice	¾ cup
Puffed Wheat	¾ cup
Shredded Wheat	1 biscuit

Group E

Any cereal or bread with sodium content of less than 6 mg sodium per 100 gm cereal

Barley	1½ tablespoons, uncooked
Corn meal	2 tablespoons
Cornstarch	2½ tablespoons
Crackers, low-sodium	5 2" squares
Flour	2½ tablespoons
Macaroni	½ cup cooked
Matzo, plain, unsalted	1 5" square
Noodles	½ cup cooked
Popcorn, unsalted	1½ cups
Rice, brown or white	½ cup cooked
Spaghetti	½ cup cooked
Tapioca	2 tablespoons uncooked
Waffle, yeast	1 3" square

Substitutions

*You may substitute one unit from Group C vegetables for one bread unit.

*Consult local bakeries about the possibility of baking low-sodium breads. They frequently prepare such items.

*If low-sodium bread and cereal products are not used, the sodium content of one serving from the bread list will rise from 5 mg to 160 mg per serving.

AVOID

Breads, quick made with baking powder, baking soda, salt or commercial mixes

Cereals, dry, except those listed in Group D

Cereals, quick-cooking and enriched with sodium compound (check label)

Corn meal, self-rising

Graham crackers or other crackers except low-sodium dietetic

Popcorn, salted

Pretzels

Waffles with salt, baking powder, baking soda or egg white

MILK UNITS (120 mg sodium)

The milk unit is one cup of milk or its equivalent in powdered or evaporated milk. Skim milk provides fewer calories but equal amounts of sodium. Low-sodium milk provides 7 mg of sodium and may be lower in nutritive content than regular milk.

MEAT

Meat, poultry, fish, eggs, low-sodium cheese and peanut butter
One unit 25 mg sodium, 75 calories

Group A

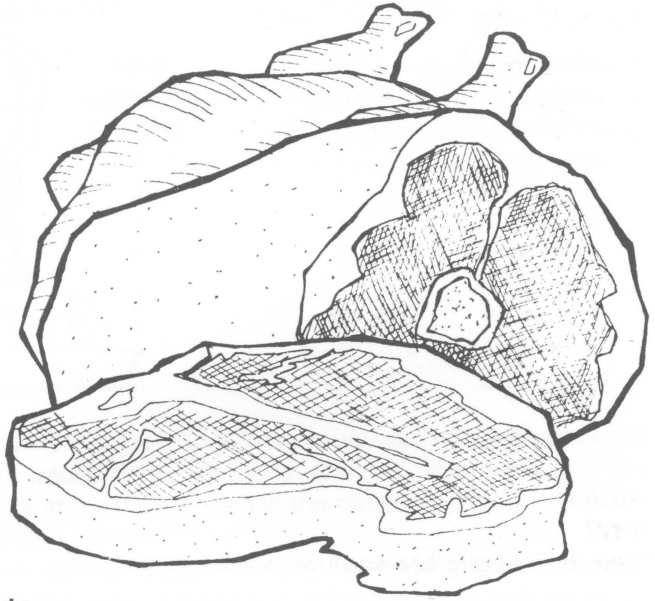
Meat or poultry: fresh, frozen or canned low-sodium
One unit equals one ounce cooked

Beef	Pork
Chicken	Quail
Duck	Rabbit
Lamb	Tongue, fresh
Liver (only once in 2 weeks)	Turkey
	Veal

Group B

Fish or fish fillets, fresh only
One unit equals one ounce

Bass	Salmon, fresh
Bluefish	Salmon, canned low-sodium dietetic
Catfish	Sole
Cod	Trout
Flounder	Tuna, fresh
Halibut	Tuna, canned low-sodium dietetic
Rockfish	



Group C
Cheese, Eggs, Nuts

Cheese, cottage, unsalted	1/4 cup
Cheese, processed low-sodium dietetic	1 ounce
Egg (limit 1 per day only)	1
Peanut butter, low-sodium dietetic	2 tablespoons

AVOID

Cheese, except low-sodium dietetic

Fish fillets, frozen

Fish, canned salted or smoked

Anchovies, caviar, salted and dried cod, herring, canned salmon (except as noted), sardines, canned tuna (except as noted)

Meat, canned, salted or smoked

Bacon, bologna, chipped or corned beef, frankfurters, ham, kosher meats, luncheon meat, salt pork, sausage, smoked tongue, etc.

Peanut butter except low-sodium dietetic

Shellfish

Clams, crabs, lobsters, oysters, scallops, shrimp, etc.



FAT

One unit negligible sodium, 45 calories

Avocado	1/3 of 4" avocado
Butter, unsalted	1 teaspoon
Cream, heavy, sweet or sour	1 tablespoon
Cream, light, sweet or sour	2 tablespoons
Fat or oil, cooking, unsalted	1 teaspoon
Fresh dressing, unsalted	1 tablespoon
Margarine, unsalted	1 teaspoon
Mayonnaise, unsalted	1 teaspoon
Nuts, unsalted	6 small

Substitutions

*Regular margarine will have approximately 50 mg sodium per teaspoon serving.

AVOID

Bacon, bacon fat
Butter, salted
Dressing, commercial French or other except low-sodium
Margarine, salted
Mayonnaise, commercial except low-sodium
Nuts, salted
Olives
Pork, salt

Food Allowances for 500-Milligram Sodium Diet

Food List	1200 Calories	1800 Calories	Unrestricted Calories
Milk	2 (skim)	2 (whole)	2 (whole)
Vegetables, A	1	1	1 or more
B	1	1	1 or more
C	1	1	1 or more
Fruit	4	4	2 or more
Bread	5	7	4 or more
Meat	5	5	5 only
Fat	0	4	as desired
Free Choice	1	2	as desired

This table gives the suggested number of servings from each unit level to make a specific calorie level. By using servings from each unit, the individual has variety in his food to please the palate and meet all known nutritional needs.

The physician or dietitian suggests the number of servings from each unit list according to the level of restriction of both sodium and calories.

It may help to know the sodium content of other foods such as soups, mixes, low-sodium commercially prepared soft drinks and beverages. Agriculture Handbook #456, available through Government Printing Office, Superintendent of Documents, Washington, D.C. 20402, will help you find the sodium content of specific foods.

Nutritional Labeling

Because of the numerous sodium compounds used in food manufacturing, it is essential to read labels carefully. Many foods contain added compounds which indicate the presence of sodium. Watch the ingredients section of the label for the following:

- salt
- sodium chloride
- sodium benzoate
- sodium propionate
- sodium sulfite
- sodium bicarbonate (baking soda)
- sodium hydroxide
- sodium alginate
- sodium acetate
- sodium nitrite or nitrate
- SAS or sodium aluminum sulfate (baking powder)
- sodium-silico-aluminate
- di-sodium-phosphate
- use of word "brine"
- chemical symbol **Na**
- tetra-sodium-pyrophosphate
- soy sauce solids
- sodium citrate
- disodium inosinate
- sodium erythrobate
- MSG or monosodium glutamate

Take particular care to read labels of seasoning, coating, salad dressing and casserole mixes.

Many food labels also have a nutrition information panel which indicates the nutritive content of the food. It is not required that the sodium content be listed unless a special claim of "salt-free" or "low sodium" appears as part of the label. Some food processing companies identify the sodium content of their food on a per serving basis but this is strictly voluntary.

Certain foods have standards set by the Food and Drug Administration. These standards are called Standards of Identity. Foods, such as catsup, mayonnaise and ice cream, which are made by a standard of identity, need not carry a list of ingredients. Such foods may not list salt but this is no guarantee that salt has not been added. Your local library can borrow, via interlibrary loan, the Federal Register, which describes those foods with Standards of Identity and lists the accepted ingredients found in these foods.

Dietetic and Specialty Foods

Certain food companies produce specially designed products low in sodium content. To show the value of these foodstuffs, contrast lima beans, peas, catsup, breads, gelatin, tomato soup and baking powder with regularly processed foods. Regularly canned vegetables and other processed foods are high in sodium because of processing methods, flavoring and packing fluid.

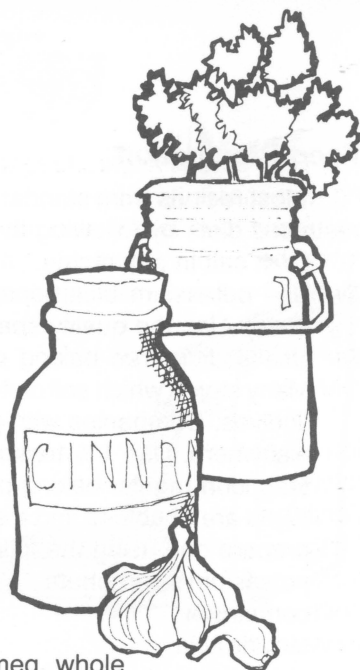
Product	Sodium Content Regular	Sodium Content Dietetic
Lima Beans	205-283 mg	5 mg
Peas	203-518 mg	3-11 mg
Catsup	180-263 mg	4 mg
Breads	80-239 mg	7 mg
Gelatin	46-90 mg	6 mg
Tomato Soup	800-900 mg	28-35 mg
Baking Powder	250-400 mg	21 mg

Seasonings

Some makers of seasonings use potassium chloride as a substitute for sodium and advertise the products as "salt-free" or "low-sodium." These substitutes should be used only with a physician's consent as potassium products are not suitable for use by persons with some kidney conditions.

Spices

Since a low-sodium diet may seem somewhat unpalatable, the addition of spices may add flavor to the food and increase the acceptability. Some spices do contain sodium however. Check the chart below.



Spice	Milligrams of sodium per teaspoon		Milligrams of sodium per teaspoon
Allspice, ground	2.04	Nutmeg, whole	
Anise seed	.3	(1 med.)	.48
Basil leaves	.1	Nutmeg, ground	4.6
Bay leaves	1.6	Onion powder	1.95
Bay leaves, crumbled		Oregano leaves	.19
(6 small)	.65	Paprika	1.35
Caraway seed	.7	Parsley flakes	1.96
Celery seed	2.8	Black Pepper,	
Celery flakes	13.8	ground	.44
Cinnamon, ground	.36	Black Pepper,	
Cloves, ground	.36	whole	.49
Cloves, whole (28)	.46	Red Pepper,	
Curry powder	1.28	ground	.59
Dill seed	.38	Red Pepper, whole	
Garlic powder	.33	(1 piece)	.06
Ginger, whole		White Pepper,	
(1 piece)	.32	ground	.2
Ginger, ground	.67	White Pepper,	
Mace, whole	2.4	whole	.29
Mace, ground	1.48	Poppy seed	.3
Marjoram, ground	.38	Sage, rubbed	.13
Marjoram leaves	.29	Sesame seed	1.74
Mint flakes	.26	Thyme leaves	.15
Mustard, powdered	.15	Thyme, ground	.36
Mustard seed	.29		

from the Food Service Department, American Spice Trade Association

Food Preparation

Most recipes from standard cookbooks are easily adapted to sodium-restricted diets by following these rules:

1. Omit salt in any recipe.
2. Use potassium bicarbonate instead of sodium bicarbonate (baking soda). Use the quality specified in the recipe.
3. Use sodium-free baking powder instead of regular baking powder. Many stores which sell dietetic foods have one of several brands on the shelves. Companies with potassium-based baking powder are listed elsewhere. Use 1½ teaspoons sodium-free baking powder for each teaspoon regular baking powder.

If you are unable to find a sodium-free baking powder, have a druggist prepare one using the following recipe:

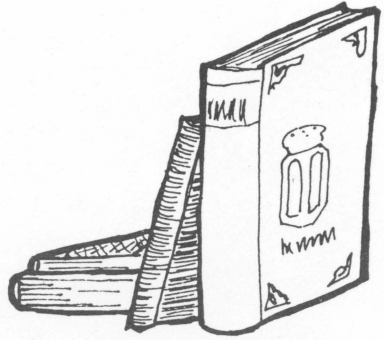
potassium bicarbonate	39.8 gms
cornstarch	28.0 gms
tartaric acid	7.6 gms
potassium bi-tartrate	56.1 gms

4. Prepare vegetables from the fresh form as much as possible. One-half cup fresh green beans boiled in water without salt contains 2 mg of sodium.
5. Foods may be canned or frozen at home and be relatively low in sodium. Preserve foods without added salt and process in distilled water if water in the area is high in sodium.
6. Non-nutritive sweetness. Most non-nutritives are made of sodium saccharin and are usually not prescribed on a sodium-restricted diet. Some non-nutritive sweeteners made of calcium saccharin might be used with a physician's approval.
7. Egg substitutes. Most egg substitutes in supermarkets have lowered cholesterol content. Most of these products are not intended for the person on the sodium-restricted diet. Many are primarily egg white, the part of the egg where most sodium is concentrated. As a result, egg substitutes may be very high in sodium. It's extremely important to read the label on egg substitutes to know the sodium content.

TEXAS A&M UNIVERSITY



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Low Sodium Cookbooks and Resources

In cookbooks, check that the number of milligrams of sodium per serving are listed. It also helps if the servings are expressed in terms of the unit lists.

For additional information, contact the American Heart Association through the Texas and local Heart Association.

Sodium Restricted Diet—500 mg.

Sodium-Restricted Diet—1000 mg.

Sodium Restricted Diet—Mild Restriction.

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