

How to Reduce Sodium in Menu Items

A User's Guide for Foodservice Operators

Prepared For CRFA

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Prepared By

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WORKING WITH THE CANADIAN RESTAURANT AND FOODSERVICES ASSOCIATION (CRFA) TO REDUCE SODIUM

In 2007, Health Canada established a multi-stakeholder Sodium Working Group (SWG) to explore options for reducing sodium in the diets of Canadians. In September 2009, the SWG set an interim dietary sodium intake goal of 2300 mg per person per day by the year 2016. Compared with the average Canadian daily sodium intake of 3400 mg, this goal represents a reduction of approximately 30% overall or 5% per year.

The SWG has devised a multi-staged and three-prong strategy to reduce sodium in the diets of Canadians:

1. Voluntary reduction of sodium levels in processed foods and foods sold in restaurants/foodservice establishments.
2. Research into sodium reduction.
3. Education to help Canadians reduce their sodium intake.

To support the voluntary reduction of sodium levels in foods, Health Canada has proposed draft sodium targets for a first set of processed food categories. Final targets for individual food categories are expected by the end of 2010 and Health Canada is working with the restaurant and foodservices industry to develop an industry-specific approach.

Meeting these targets will necessitate reduced sodium levels in commercially prepared foods both in retail and foodservice establishments. Although sodium targets for foods in the restaurant and foodservices industry are not yet fully clear, many establishments have already taken significant steps to reduce the sodium content of menu items. These efforts should continue and be embraced industry-wide in preparation for final recommendations from the Sodium Working Group.

CRFA's position

As a member of the Sodium Working Group, CRFA supports a national voluntary sodium reduction strategy that includes a comprehensive public education strategy to ensure Canadians can make responsible and informed decisions about their dietary sodium intake levels.

CRFA has commissioned this user's guide, with the support of Agriculture and Agri-Food Canada, to help foodservice operators assess the sodium content of menu items and begin exploring ways to reduce sodium levels.

We welcome dialogue with stakeholders on Health Canada's Sodium Working Group, including the scientific and public health communities, health organizations, consumer groups, food industry counterparts and government.

WHERE'S THE SODIUM?

The major source of sodium added to foods is table salt made up of 98-99% sodium chloride. Sodium chloride is approximately 40% sodium and 60% chloride by weight, and so one teaspoon (about 6 g or 6000 mg) of table salt contains 2300-2400 mg of sodium. Salt is typically used for the characteristic salty flavour it imparts to foods and to enhance or balance other flavours. In addition to table salt, other sources – like food additives – contribute to the total sodium content of menu items.

Table salt

In most restaurants, regular table salt (or salt) is the main source of sodium added to recipes and menu items – and the one you, as a foodservice operator, can directly control. Therefore, reducing salt use will most effectively lower sodium content of menu items. Operators have less direct control over other sources of sodium (mainly food additives) in foods.

Other salts

Sea salt and kosher salt are also used in some foodservice establishments. Sea salt contains slightly less (95-98%) sodium chloride than regular table salt. Although still high in sodium, sea salt is lighter by volume than table salt because of its typically larger crystals. Essentially, one teaspoon of sea salt weighs less than one teaspoon of table salt and thus contains slightly less sodium.

Similarly, kosher salt crystals are larger than table salt crystals, and so kosher salt also contains slightly less sodium by volume. You can use sea salt and kosher salt instead of table salt in recipes and menu items to help reduce sodium content while maintaining an acceptable flavour. However, keep in mind these reductions would not be significant and other measures are still necessary.

Food additives

Several food additives such as sodium citrate and sodium phosphate are sources of sodium in foods. Sodium-containing additives are typically found in ready-made foods and ingredients, rather than used directly in recipes and food preparation methods. Knowing about these additives can help you assess all sources of sodium in ingredients and foods used at your establishment.

Some sodium-containing food additives can be used directly at foodservice operations. For example, baking soda (sodium bicarbonate) and baking powder (contains sodium bicarbonate) are leavening agents in baking operations. Another example is monosodium glutamate (MSG), a flavour enhancer commonly used in recipes and menu items either directly or through ready-made seasoning preparations.

The following table lists the sodium contribution of common sodium-containing food additives.

Food Additive	Sodium Content (%)	Typical Food Use Level (%)	Sodium in Food (mg/100g food)
Sodium benzoate	16.0	0.10	16
Sodium chloride (table salt)	39.3	1.50-2.00	590-790
Sodium diacetate	16.2	0.10-0.40	16-65
Sodium lactate	20.5	1.50-3.0	310-620
Sodium nitrite	33.3	0.012	4
Sodium propionate	23.9	0.30	70
Sodium sorbate	17.1	0.30	50

Adapted from: Doyle, ME. Sodium reduction and its effects on food safety, food quality and human health. FRI Briefings. Food Research Institute, University of Wisconsin (2008)

For a complete list of permitted food additives, see the following resources:

[Health Canada](#)

[Encyclopedia of Food Additives](#)

[Updates to Encyclopedia of Food Additives](#)

Ready-made foods

Ready-made ingredients and foods in menu items are also key sources of sodium at foodservice establishments. These ingredients and foods include condiments such as ketchup and mustard, garnishes like pickles and olives, deli meats, cheese, bread, soy sauce, bouillon cubes, soup broths and canned tomatoes. (See [Step 4](#) for ways to reduce sodium content in ready-made items.)

HOW SODIUM AFFECTS FOOD

The functions of sodium in food fall into three broad categories – taste, food processing and food preservation. These functions significantly impact if and how sodium can be reduced in ready-made inputs in foodservice establishments. The following table provides a general overview of the functions of sodium in food.

Taste	<p>Effects are highly dependent on the food matrix</p> <ul style="list-style-type: none"> • Provides the basic salt taste • Enhances desirable flavours • Suppresses bitterness and other undesirable flavours • Balances and blends flavours to develop overall taste profile • Improves palatability
Food Processing	<p>Diverse effects are product- and process-specific</p> <ul style="list-style-type: none"> • Provides texture and consistency (cheese, dough, baked goods, canning) • Tenderizer (meat)

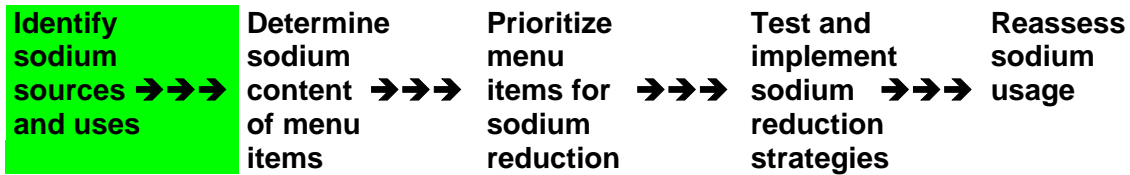
	<ul style="list-style-type: none"> • Controls ripening (cheese) • Provides mouthfeel and volume (with carbohydrates in various foods) • Binder (cheese, processed meats) • Colour developer (processed meats, bread crust browning) • Controls fermentation
Food Preservation	<p>Effects are critical to food safety</p> <ul style="list-style-type: none"> • Reduces water activity to inhibit growth of microorganisms and delay or prevent spoilage • Controls fermentation (some pickling applications)

STEPS TO REDUCING THE SODIUM CONTENT OF MENU ITEMS

The following series of “how to” steps can help you reduce the sodium content of your menu items. It focuses on sodium-containing ingredients and foods used by foodservice operators in recipes, food preparation methods and menu items, and addresses the use of sodium mainly as a function of taste.^{1,2}

¹ *Reducing sodium levels directly in ready-made ingredients and foods is not addressed because the sodium content of these foodservice inputs resides with manufacturers*

² *Sodium reduction when sodium is used for food processing and preservation functions is addressed only briefly because these functions are more applicable to food manufacturing, and are more technologically challenging and outside the scope of this guide*

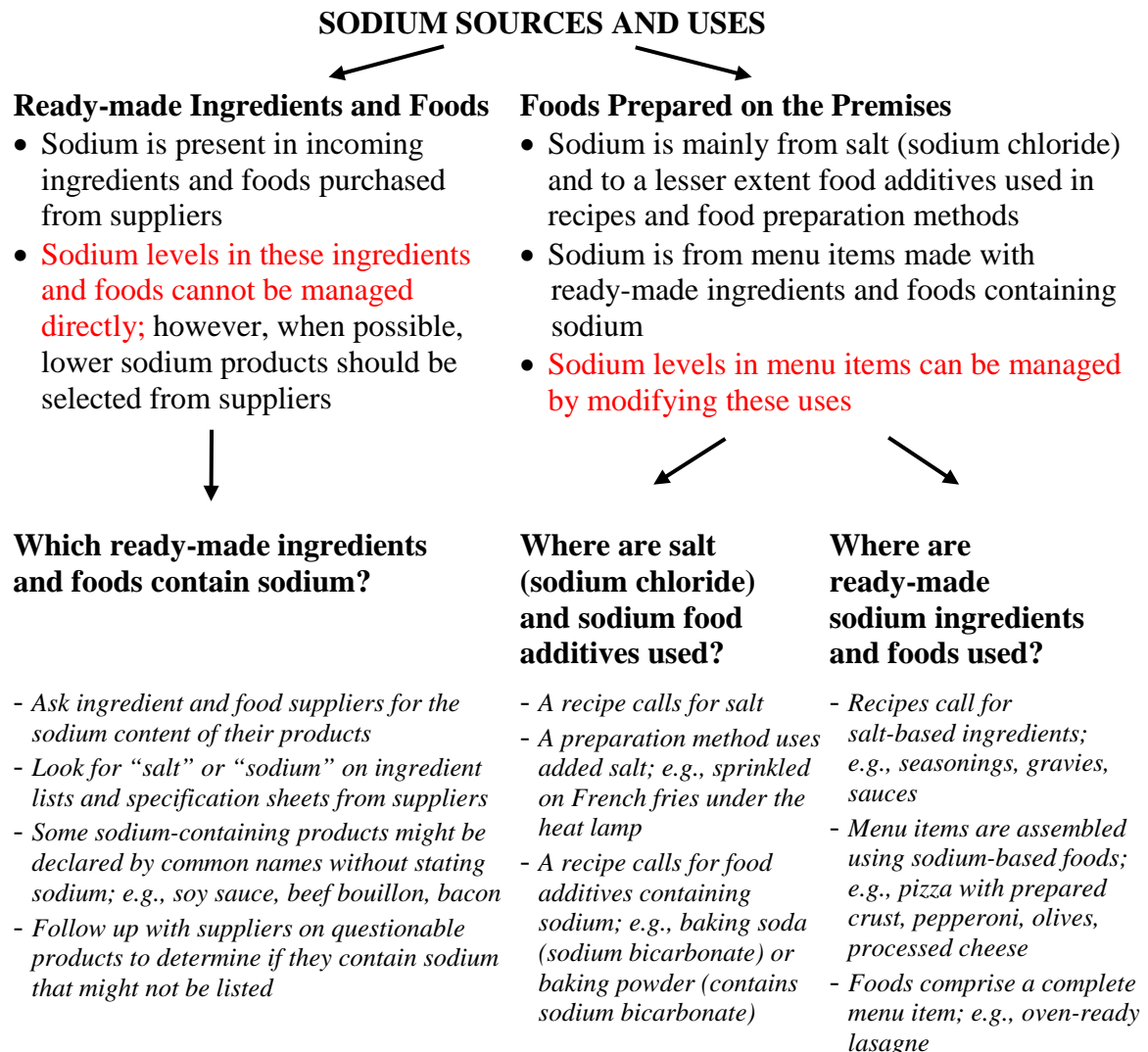


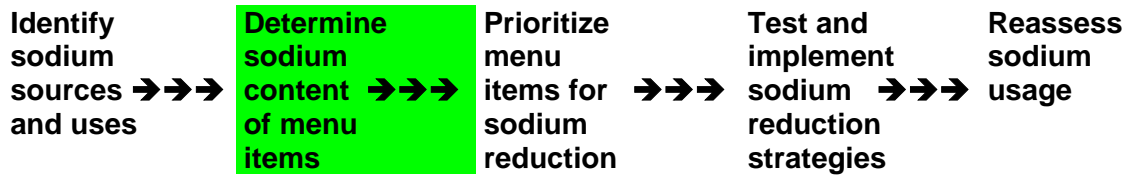
STEP 1 – Identify sodium sources and uses

Sources of sodium at foodservice establishments fall into two categories:

1. Sodium in ready-made ingredients and foods
 - Sodium levels cannot be managed directly by foodservice operators because levels are set in formulations from ready-made ingredient and food manufacturers.
2. Sodium in foods prepared on-premise
 - Sodium levels can be managed directly by foodservice operators through modifying recipes, food preparation methods and the ready-made ingredients and foods used in menu items.

You can use this flow chart to determine where sodium can be found.





STEP 2 – Determine the sodium content of menu items

Sodium content of menu items can be determined by calculation or direct laboratory analysis. Both methods are acceptable for substantiating sodium values – for example, if you provide sodium information and claims on menu items.

Method 1: Calculation	Method 2: Direct laboratory analysis
<p>Calculations are best carried out by experts in nutrient and recipe analysis and database management.</p> <p>Sample providers</p> <ul style="list-style-type: none"> • Food to Facts • Info Access (1988) Inc. • NutriFacts • Oasis Institute 	<p>Using accredited analytical laboratories is generally considered the ‘gold standard’ for determining nutrient values.</p> <p>Sample providers</p> <ul style="list-style-type: none"> • Guelph Food Technology Services • Maxxam Analytics • Silliker Canada

Please note this list is not exhaustive. Make sure the information obtained from the service is complete and accurate.

Do-it-yourself: Calculating sodium content

Foodservice operators can estimate sodium values in menu items using the calculations below. These values may indicate which items you can start with for sodium reduction and obtain relative ‘before and after’ measures to assess the impact of any sodium reduction strategies you implement.

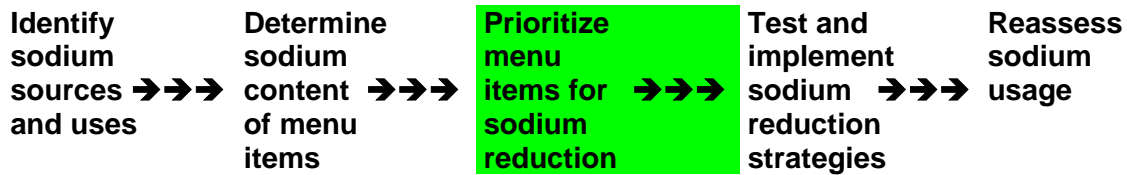
- | |
|---|
| <ul style="list-style-type: none"> • Calculate the amount of sodium from each ready-made¹ ingredient or food and other foods^{2,3} used in a menu item
<i>(amount of sodium in the ready-made product X amount of the ready-made product used)</i>
<i>(e.g., if a product contains 2% sodium and 500 g of the product is used, the calculation is 0.02 X 500 g = 10 g, so the product’s sodium contribution to the menu item is 10 g)</i> |
| <ul style="list-style-type: none"> • Calculate the amount of sodium from salt (sodium chloride) or sodium food additives used directly in a recipe or preparation method for a menu item
<i>(for salt – amount of salt used X 40%, which is the sodium content of salt)</i>
<i>(e.g., if 5 g of salt is used, the calculation is 5 g X 0.40 = 2 g, so that the salt’s sodium contribution is 2 g)</i> |
| <ul style="list-style-type: none"> • Add all of the above sodium amounts to obtain the total sodium content of a menu item |
| <ul style="list-style-type: none"> • Divide this total sodium content by the yield (number of servings) to obtain the sodium content per serving of a menu item |

¹ Sodium content of ready-made ingredients and foods is obtained from suppliers

² Unprocessed foods (fresh fruit and vegetables, meat, eggs, etc.) naturally contain sodium,

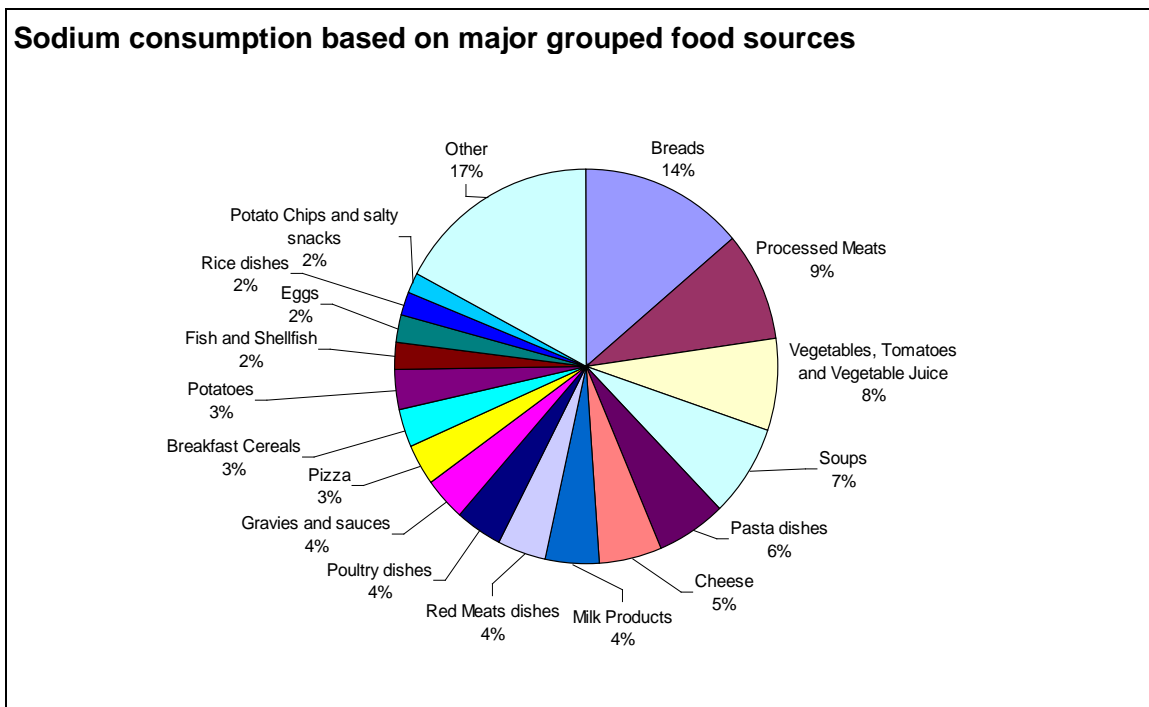
which must also be counted

³ Sodium values for these foods are available in food composition databases such as the [Canadian Nutrient File](#) and [USDA Nutrient Database for Standard Reference](#)



STEP 3 – Prioritize menu items for sodium reduction

Once you know the sodium sources and levels in menu items, your next step is to prioritize items for sodium reduction. This task is complex because sodium is ubiquitous in the food supply – it would not be effective to focus on a few foods to achieve a population-wide reduction in sodium intake. In foodservice settings, a similar pattern would emerge with sodium coming from a wide variety of menu items.



Source: Health Canada (Bureau of Nutritional Sciences). Data were collected in 2004 and are from the Canadian Community Health Survey (CCHS Cycle 2.2 Nutrition) of over 35,000 respondents

To begin, you can rank menu items in order of sodium content to identify the highest contributors. The sodium content of these items can be compared with the Sodium Working Group interim dietary sodium intake goal of 2300 mg per day (total all foods combined). Menu items for consideration can also be based on the major grouped food sources (as shown in the pie chart) or on food categories for which the SWG has proposed draft sodium targets. [Click here](#) for these categories and targets from Health Canada. (Note that these targets are expected to change, but the final targets will be available from Health Canada when published.)

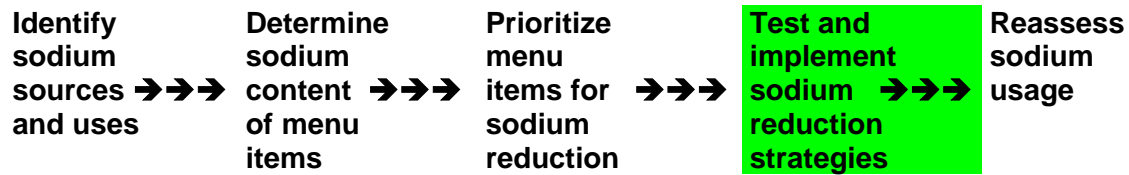
Operators should keep in mind that prioritizing menu items for sodium reduction should not depend solely on sodium content. Several other factors must be considered on a case-by-case basis because sodium’s functions are different depending on the food application.

For example, taste-related functions depend on the food matrix and food processing effects are diverse. Some menu items may not have the highest sodium content, but can be easier to replace due to few impacts on taste or other characteristics.

Guiding questions

The following questions can help you select priorities for sodium reduction from existing menu items. Also consider opportunities to create new menu items with lower or no sodium, and evaluate their potential success and fit with your menu offerings.

Questions	Considerations
<ul style="list-style-type: none"> • Are there menu items in which salt (sodium chloride) addition is arbitrary or not standardized? 	<ul style="list-style-type: none"> - Training of staff to use minimal amounts (<i>e.g.</i>, when salting French fries or finishing a dish)
<ul style="list-style-type: none"> • What is the availability of lower-sodium ready-made ingredients and foods? 	<ul style="list-style-type: none"> - Lower-sodium products are available, and more are expected as food manufacturers make progress toward the sodium reduction targets and as consumers drive demand with increasing awareness of sodium intakes - Different suppliers of ingredients and foods may offer lower-sodium products
<ul style="list-style-type: none"> • What is the function of sodium in the menu item? 	<ul style="list-style-type: none"> - Taste – palatability and consumer acceptance are key and gradual reductions often work best - Food processing – technical effects in the end product must be achieved - Food preservation and shelf-life – food safety cannot be compromised
<ul style="list-style-type: none"> • What is the availability of salt (sodium chloride) substitutes? 	<ul style="list-style-type: none"> - Suitable salt substitutes are very limited; however, use of herbs and spices can compensate for loss of saltiness and flavour and are well accepted by consumers
<ul style="list-style-type: none"> • What are the costs involved? • Is there any elasticity for costs to be transferred to menu item prices? 	<ul style="list-style-type: none"> - Various costs for alternative ingredients, recipe development and changes in food preparation methods - The impact of transferring costs to consumers and/or reducing operating margins must be evaluated on a product-by-product basis to determine the feasibility of doing so



STEP 4 – Test and implement sodium reduction strategies

After selecting menu items for sodium reduction, you should lower sodium levels in those items. Various methods can be followed depending on sodium sources, uses and functions. Due to these variables, sodium reduction efforts must be tailored to particular needs and applications. Testing redesigned menu items and food preparation methods is also critical to ensure acceptable taste and other functional requirements of sodium are maintained.

The following methods can reduce the sodium content of menu items. These methods are not mutually exclusive and more than one can be applied to a menu item. Given salt’s role in the preservation of some foods, food safety must be considered when sodium chloride is reduced or removed. Appropriate measures (such as refrigeration, reduction in time lag between food preparation and consumption, proper storage, etc.) must be taken to ensure food safety.

Method 4a: Use lower-sodium or sodium-free versions of ready-made ingredients and foods n menu items

Added sodium levels in ready-made ingredients and foods are usually set in formulations from manufacturers. Therefore, the easiest way to reduce sodium levels in menu items made with ready-made inputs is to ask suppliers or manufacturers for lower sodium and sodium-free versions. For any proprietary ingredients, the best option is to work with manufacturers to reduce the sodium level in their formulations. As manufacturers carry out the reformulation work, this strategy is the least burdensome to foodservice operators.

At this time, lower-sodium or sodium-free versions of ready-made ingredients and foods might not be available for all menu items. Supply is expected to increase with implementation of the SWG’s sodium reduction strategy, which will help increase consumer awareness of, and demand for, lower-sodium foods.

See [Method 4c](#) for tips on unsalted versions of specific ingredients and foods.

Method 4b: Use less salt (sodium chloride) in recipes and food preparation methods for menu items

The most common reason for using salt in foodservice recipes and food preparation methods is taste. Operators can work with chefs and recipe developers to create menu items with less salt and a desirable taste.

Reducing salt

To use less salt in recipes, start with small step-wise reductions (5-10%) and test consecutive reductions as long as taste is not compromised. As the salt level reduces, taste will noticeably change – the goal is to achieve acceptable taste in a lower-salt recipe. Acceptable taste can be obtained by adding flavourful ingredients such as herbs and spices. See [Method 4c](#) for further flavouring tips.

You can also experiment with other salts such as kosher or sea salt. As these salts contain less sodium than table salt by volume, substituting volume for volume will help reduce the sodium content of a menu item.

Example: Sodium in marinara sauce – table salt vs. kosher salt

Salt in Marinara Sauce Recipe (yield 100 ~5oz servings)		
Type of Salt	Amount of Salt	Sodium Content (per serving)
Table salt	1/2 cup	570mg
Table salt	3/8 cup	430mg
Kosher salt	1/2 cup	470mg
Kosher salt	3/8 cup	350mg

Source: Jones-Mueller, A. *Meeting the sodium challenge, Part I. Nation's Restaurant News* <http://www.nrn.com/article.aspx?id=366838> (accessed March 18, 2010)

Consider using less or no salt in some food preparation methods (*e.g.*, sprinkled on French fries under the heat lamp or a pinch “here and there”) so the choice of adding salt is the consumer’s. This approach will become more acceptable as increased education efforts raise consumer awareness on how to manage sodium intake. It is important to reduce sodium gradually so consumer palates can adapt to less saltiness over time.

Use salt substitutes and flavour enhancers^{1,2}

Suitable salt substitutes are very limited due to the complex taste mechanism of salt and other research gaps. Cost, flavour and the food matrix also limit the use of the substitutes available. One way to identify possible salt substitutes for a recipe or menu item is to consult with ingredient suppliers.

Potassium chloride is the most common substitute and can be used on its own. However, it costs more than salt and has about 10% of the salt intensity of sodium chloride, leaving a bitter or metallic off-taste when used at high levels. Many newer generation salt substitutes use potassium chloride combined with other substances to help overcome these issues.

Other ingredients such as yeast extracts and hydrolyzed vegetable proteins are taste enhancers that work by activating receptors in the mouth and throat to help compensate for salt reduction.

¹ These compounds and approaches are not discussed in detail because they are more common in commercial applications and less relevant to foodservice operations

² More information is available in these references: Brandsma, I. Reducing sodium: A European perspective. *Food Technology* 60:25-29 (2006); Dotsch, M. et al. Strategies to reduce sodium consumption: A food industry perspective. *Crit Rev Food Sci* 49:841-851 (2009)

Method 4c: Change the selection of ready-made ingredients and foods used in recipes, food preparation methods and menu items

Ready-made ingredients and foods typically high in sodium can indicate areas where operators can make changes to lower the sodium level in a recipe or menu item.

Ingredient or Food¹	Examples²
Canned foods	- tomatoes, other vegetables, legumes
Cured meats or fish	- bacon, canned sardines, anchovies
Dry or canned soup mixes and broths	- bouillon cubes
Dry mixes for dressings and sauces	- marinade, dressing and stuffing mixes
Flavouring and marinating sauces	- soy, teriyaki, barbeque and steak sauces
Prepared condiments	- ketchup, mustard, relish
Preserved foods	- pickles, olives
Processed luncheon meats	- deli ham, salami
Side offerings and snacks	- potato and nacho chips
Generally foods that are more processed	
Generally foods that are pickled, marinated, smoked or barbequed	

¹ List is not exclusive

² Examples only; sodium content of ingredients and foods used specifically is obtained from suppliers (per step 1)

Quick and easy tips to reduce sodium

These tips cover a variety of applications in diverse foodservice operations. Not all tips will be feasible for all settings. Foodservice operators can choose the approaches that best meet their particular needs.

Commonly Available Unsalted Ingredients and Foods
Use crackers with unsalted tops
Use oils and unsalted butter and margarine instead of regular butter and margarine
Use unsalted nuts, pretzels or popcorn to offer as snacks at a bar
Condiments and Sauces
Provide condiments such as ketchup, mustard and relish in separate containers available upon request instead of directly with menu items
Remove salt shakers from tables and provide them upon request only

Dilute soy sauce used in recipes and food preparation methods with water; best if done immediately before the soy sauce is to be used (possible food safety concerns)
Use malt vinegar
Flavour
Use fresh and dried herbs and spices to add flavour to foods
Use salt-free dried seasoning blends
Squeeze lemon or lime juice on a dish just before serving
Sprinkle chopped fresh herbs and a dash of pepper on a dish just before serving
Use aromatic or more intensely flavoured ingredients such as garlic, onion and leek
Fruit and Vegetables
Offer more fresh fruit and vegetables as deserts (fruit) and side dishes (vegetables)
Use fresh or frozen vegetables instead of canned
If canned vegetables are used, drain and rinse them first
Prepare soups and broths in-house with lots of fresh or frozen vegetables for flavour
Provide fresh vegetables such as lettuce, tomato, cucumber, avocado, onion instead of condiments as accompaniments for hamburgers
Make pizzas with more vegetable toppings
Use raw vegetables such as carrot and celery sticks and cherry tomatoes instead of pickles and olives as garnishes
Provide plain baked potatoes and steamed rice as standard side dishes
Mains – Meats and Other Protein Sources
Offer a greater selection of meat alternatives (egg, unsalted peanut butter) instead of luncheon meats as sandwich fillings
Use less “seasoned” prepared meats and look for products with higher percent meat protein as they will tend to be lower in sodium due to a lower level of sodium phosphate required in the product
Grill, bake, broil or roast plain meat and poultry to bring out natural flavours and instead of frying them in a breading or coating that is high in sodium
Marinate meat in olive oil or fruit juices instead of ready-made sauces
Drain and rinse canned legumes (<i>e.g.</i> , chick peas, kidney beans, lentils) before using
Rinse thawed seafood before use as it may have been glazed with sodium tripolyphosphate to help protect it from freezer burn during storage
Use lower sodium cheeses such as Swiss or bocconcini
Miscellaneous
Use more minimally processed fresh or frozen foods wherever practical
Do not add salt to cooking water for boiling potatoes, pasta or rice
Cook with wine, vinegar and fruit juices
Reduce portion sizes

Method 4d: Reduce the amount of sodium-containing food additives used directly in recipes and food preparation methods for menu items (if applicable)

Sodium bicarbonate (baking soda) for baking is one of the few examples of sodium-containing food additives used directly at foodservice operations.

It is challenging to reduce the use of, or replace, sodium-containing food additives due to their functional requirements in the finished product – for example, baking soda for leavening. Reducing the levels of these additives will require a number of test runs and assistance from ingredient suppliers, chefs or recipe developers.

Generally, sodium from these sources in foodservice applications is much smaller than the levels contributed by sodium chloride. Unless a particular application involves a significant contribution from a sodium-containing food additive, operators should consider other sodium reduction strategies in this guide for more significant results.

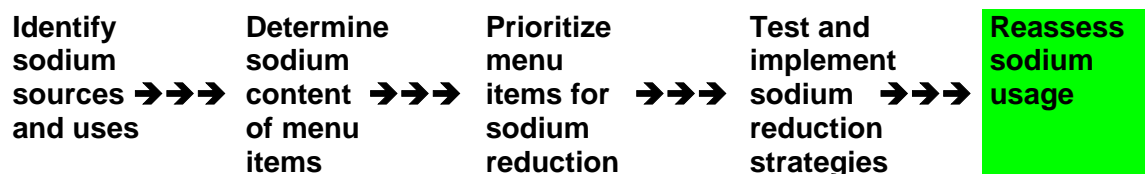
Method 4e: Consider reducing sodium in recipes and food preparation methods where it is not used for taste (if applicable)

Sodium is rarely directly used at foodservice operations for food processing and preservation because these functions are more applicable to ready-made foods in manufacturing settings.

Any changes in sodium levels in food processing or food preservation must be thoroughly tested and confirmed to have no impact on shelf life and pose no health risk before implementation. This confirmation is especially critical where sodium functions as a preservative to inhibit microbial growth, ensuring safety of the finished product is maintained.

Operators should consult food scientists and other experts before undertaking sodium reductions in these cases due to sodium's critical functions – for example, sodium used for food preservation is essential to food safety.¹

¹ *More information is available in Doyle, ME. Sodium reduction and its effects on food safety, food quality and human health. FRI Briefings. Food Research Institute, University of Wisconsin (2008)*



STEP 5 – Reassess sodium usage

Once you have sodium reduction strategies in place, your final step is to reassess sodium sources and recalculate the sodium content of redesigned menu items. This step is useful for developing consumer communications about sodium reduction efforts, including claims of compliance with nutrition labelling regulations.

Communication examples you can use include:

- stating the sodium content has been reduced in a percentage of menu items
- stating the sodium content has been reduced in some categories of menu items
- stating only a low-sodium version of a certain ingredient or food is used

The sodium content of menu items is also required to substantiate sodium claims, including nutrient content and health claims as outlined in the Canadian Food Inspection Agency (CFIA) *Guide to Food Labelling and Advertising*. These claims are allowed in food labelling and advertising, including in restaurants and other foodservice establishments – for example, on promotional and advertising materials such as menus, menu boards, table tents and posters.

Making Sodium Claims

Use the following chart to help determine which sodium reduction claims you can make. [Click here](#) for additional guidance from CFIA for the restaurant and foodservices industry.

Sodium Content Claim	Sodium Level
• Sodium-free; salt-free	< 5mg per reference amount and serving size
• Low sodium; low salt	≤ 140mg per reference amount and serving size
• Sodium-reduced; salt-reduced • Lower sodium; lower salt • Less sodium; less salt	Contains at least 25% less sodium per reference amount versus a similar reference food
• No added sodium; no added salt	No added salt, other sodium salts or ingredients that contain sodium that functionally substitute for added salt
• Lightly salted	Contains at least 50% less added sodium versus the added sodium in a similar reference food
Sodium Health Claim	
• A healthy diet containing foods high in potassium and low in sodium may reduce the risk of high blood pressure, a risk factor for stroke and heart disease. [Naming the food] is sodium-free [or low sodium]	

For complete regulatory guidance, consult the Canadian Restaurant and Foodservices Association (CRFA) [User's Guide for Providing Nutrition Information to Consumers](#) and the CFIA [Guide to Food Labelling and Advertising](#).

HELPFUL RESOURCES

Food in Canada – [Encyclopedia of Food Additives](#) and [yearly updates](#)

Health Canada – [Draft Sodium Targets for Foods](#)

Health Canada – [Sodium Homepage](#), including information on Sodium Working Group

2010 Buyers' Guide

Food in Canada. October: 41-101 (2009)

A useful index of food additive and ingredient suppliers that can serve as a starting point for information for particular needs related to the additives and ingredients mentioned briefly in step 4

SODIUM “101”

The rest of this guide covers the physiological aspects of sodium for foodservice operators seeking a deeper understanding of this nutrient.

Functions of sodium in the body

Sodium is a dietary mineral and an essential nutrient for humans. Along with other minerals, the primary role of sodium is to maintain proper fluid balance in the body by controlling the movement of fluids in and out of cells. Sodium and chloride determine extracellular fluid volume and maintain plasma volume (1) and sodium and potassium function in the regulation of blood pressure (2). Sodium, chloride and potassium are also classified as electrolytes (electrically charged particles or ions) generally known to help transmit nerve impulses throughout the body and send messages from the brain to the muscles (including the heart muscle) to contract or relax.

Dietary reference intakes for sodium

Requirements for sodium are established in the Dietary Reference Intakes (DRIs), which are the professionally recognized set of nutrient requirements used in Canada and the United States (3). For many nutrients, the DRIs include an Estimated Average Requirement (EAR) and Recommended Dietary Allowance (RDA) calculated from the EAR. For sodium and other nutrients, the data were inadequate to determine an EAR (and thus an RDA) and the requirement is established as an Adequate Intake (AI). Both the RDA and AI are intake levels considered to meet or exceed the needs of almost all healthy individuals. For many nutrients, the DRIs also include a Tolerable Upper Intake Level (UL) or the highest daily intake considered to pose no risk of adverse health effects.

The following table provides the AI and UL values for sodium (1). The AI represents a level to ensure the overall diet is adequate in other nutrients and to cover sodium losses in sweat in unacclimatized people exposed to high heat or physically inactive people. The AI does not apply to people who experience larger sodium sweat losses such as competitive athletes and workers in extreme high temperature situations. The UL for sodium is based on the association with high blood pressure as the adverse health effect.

Age Group	Adequate Intake Level (sodium mg/day)	Tolerable Upper Intake Level (sodium mg/day)
0 through 6 months	120	Not determined (no data)
7 through 12 months	370	Not determined (no data)
1 through 3 years	1000	1500
4 through 8 years	1200	1900
9 through 13 years	1500	2200
14 through 18 years	1500	2300
19 through 30 years	1500	2300
31 through 50 years	1500	2300
51 through 70 years	1300	2300
> 70 years	1200	2300

Source: Institute of Medicine (1)

Sodium intakes of Canadians

The following tables provide data on sodium intake from foods and beverages, excluding sodium from salt added to foods during cooking or at the table (4). Average sodium intake for adults 19 years of age and older is 2882-4066 mg/day for males and 2300-2806 mg/day for females; and average sodium intake is above the UL for all age and sex groups. When analyzed by frequency of adding salt to foods at the table, average sodium intake is also above the UL for all groups, including people who report never adding salt. Overall, these results demonstrate the sodium intakes of Canadians exceed dietary requirements.

Compared with sodium intakes in other industrialized countries, Canadian intakes are on par or lower. Since varying food supply and dietary patterns among countries contribute to differences in sodium intake, sodium reduction strategies in Canada should reflect, and be feasible within, the Canadian food supply and diet.

Age Group (years)	Average Sodium Intake (mg/day)	Tolerable Upper Intake Level (UL) for Sodium (mg/day)	Percentage with Usual Sodium Intake over UL (% above UL)
1-3	1918	1500	77
4-8	2677	1900	93
9-13 Male	3513	2200	97
Female	2959	2200	83
14-18 Male	4130	2300	97
Female	2938	2300	82
19-30 Male	4066	2300	99
Female	2793	2300	76
31-50 Male	3607	2300	92
Female	2806	2300	72
51-70 Male	3334	2300	86
Female	2573	2300	62
> 70 Male	2882	2300	77
Female	2300	2300	45

Source: Garriguet, D., Statistics Canada (4)

Frequency of Adding Salt at the Table	Average Sodium Intake (mg/day)
Never	2927
Rarely	3074
Occasionally	3182
Very often	3396

Source: Garriguet, D., Statistics Canada (4)

SODIUM IN FOODS

Sodium occurs naturally in unprocessed foods. It is also added to processed foods as sodium chloride and other sodium-containing compounds such as sodium phosphate, sodium carbonate and monosodium glutamate. The major form of dietary sodium is sodium chloride (1); and the breakdown of sodium chloride sources in the North American food supply is:

Source	% of Total Sodium Chloride
Added to foods during processing	77
Naturally occurring in foods	12
Added to foods at the table	6
Added to foods during cooking	5
Tap water	<1

Source: *Institute of Medicine (5)*

Food sources of sodium in the Canadian diet

The most recent diet survey data indicate 10 food groupings account for 55% of the sodium Canadians consume (4), with the breakdown as follows:

Food Grouping	% of Total Sodium Intake
Pizza, sandwiches, submarines, hamburgers, hotdogs	19.1
Soups	7.4
Pasta	5.7
Liquid milk and milk-based beverages	4.0
Poultry and poultry dishes	3.8
Potatoes	3.4
Cheese	3.2
Cereals	3.0
Beef	3.0
Sauces	2.9

Source: *Garriguet, D., Statistics Canada (4)*

APPENDIX

WHO'S PART OF HEALTH CANADA'S SODIUM WORKING GROUP?

Scientific and Health Professional Communities	Canadian Society for Nutritional Sciences Canadian Stroke Network CIHR Institute of Circulatory and Respiratory Health Council of Chief Medical Officers of Health Dietitians of Canada
Health-Focused and Consumer NGOs	Blood Pressure Canada Canadian Council of Food and Nutrition Centre for Science in the Public Interest Heart and Stroke Foundation of Canada Reference Centre for Human Nutrition (<i>extenso</i>)
Food Manufacturing Industry	Baking Association of Canada Canadian Council of Grocery Distributors Canadian Meat Council Dairy Processors of Canada Food and Consumer Products of Canada Food Processors of Canada
Foodservice Industry	Canadian Restaurant and Foodservices Association
Government Agencies	Agriculture and Agri-Food Canada Canadian Food Inspection Agency Federal Provincial Territorial Group on Nutrition Food Directorate Office of Nutrition Policy and Promotion Public Health Agency of Canada

Source: Health Canada (6)

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