



Fact Sheet on Salt and Permissible Sodium Content in Certain Foodstuffs

Introduction

Salt, also known as table salt or rock salt (halite), is a crystalline mineral that is composed primarily of sodium chloride (NaCl), a chemical compound belonging to the larger class of ionic salts. It is absolutely essential for human and animal life, but can be harmful to humans, animals and plants in excess. Salt is one of the oldest, most ubiquitous food seasonings and salting is an important method of food preservation. The taste of salt (saltiness) is one of the basic human tastes.



[Picture Credit: Salt]

Chloride and sodium ions, the two major components of salt, are needed in small quantities by all known living creatures. Salt is involved in regulating the water content (fluid balance) of the body. The sodium ion itself is used for electrical signalling in the nervous system. Because of its importance to survival, salt has often been considered a valuable commodity during human history.

[Picture Credit: Halite]

However, as salt consumption has increased during modern times, scientists have become aware of the health risks associated with high salt intake, including high blood pressure in certain individuals. Because of this, some health authorities have recommended limitations of dietary sodium intake, although others state the risk is minimal for typical western diets. The United States Department of Health and



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Human Services recommends that individuals consume no more than 1 500 to 2 300 mg of sodium (3 750 to 5 750 mg of salt) per day depending on age (this is the equivalent of one teaspoon of salt per day).

Halite, the natural form of salt, is a very common and well-known mineral. It is found in solid masses, and as a dissolved solution in the oceans and in salt lakes.

Intake of Too much Salt can be Fatal

Consumption of too much salt can be deadly – one only needs take about 1 gram of salt per kilogram of weight to die.

Different Types of Salt

Salt is a natural mineral made up of two elements on the periodic table – sodium and chloride. Salt occurs naturally in the sea, but can also be mined from salt mines on land. There are a variety of different kinds of salt that can be bought in a grocery store, e.g.:

- Iodated table salt which is rich in iodine.
- Sea salt - made by evaporating seawater.
- Pickling salt - has no additives and is generally used in brines to pickle foods.
- Kosher salt - salt commonly used when preparing kosher meat.
- Himalayan pink salt - harvested in the foothills of the Himalayan mountain range and is basically fossilised sea salt.
- Black salt - known as Kala Namak - it is actually a pinkish-grey colour. It is mined in India and has a strong sulphuric smell.

Both sea salt and table salt contain about 40% sodium

Maintaining a Balance Between Sodium and Potassium Intake

The World Health Organization recommends that a sufficient amount of potassium (K) should be consumed. The ratio between sodium (Na) to potassium (K) intake should be 1:1.

Human Salt Requirements

Sodium maintains the body's fluid and electrolyte balance, acid-base balance, muscle contractions, and nerve transmission. There is no recommended daily allowance (RDA) for sodium because the human diet has never lacked it. An adequate amount of sodium for adults is between 250 and 500 mg/day. The Tolerable Upper Intake Level (UL) for healthy adults is 2 300 mg/day.

For 'salt-sensitive' people, blood pressure will increase in direct proportion to increases in sodium intake. About 60% of adults with high blood pressure are salt sensitive.

Sodium deficiency is extremely rare. The kidneys conserve and release sodium as needed to maintain fluid balance. The amount of sodium lost in a day, in the form of urine and sweat, equals the amount of sodium eaten in the diet.

Iodated Salt

Iodine deficiency is the main cause of preventable brain damage and reduced IQ in children worldwide. It also negatively affects women's health, as well as economic productivity and quality of life. Most people need an additional source of iodine as it is found in relatively small amounts in the diet. The World Health Organization (WHO) recommends universal salt iodisation – the fortification with iodine of all salt used for human and animal consumption – as the main strategy for eliminating iodine deficiency.

The iodisation of salt in South Africa is regulated by the Regulations Relating to Salt (Published under Government Notice No. R.239 of 16/3 /2001 - as corrected by: Government Notice No. R. 1102 of 9 /11/2001 - as amended by: Government Notice No. R. 1368 of 21/12/2001) under the Foodstuffs, Cosmetics and Disinfectants Act, 1972 (Act No. 54 of 1972).

The Heart Foundation's Five (5) Tips to Reduce Salt in One's Diet

1. Cut down on processed foods:
Salt is found in almost every pre-prepared food, from processed meat to canned soup, to bottled dressings and packaged sauces, bread, and condiments such as tomato sauce and pickles.
2. Cook at home:
By preparing and cooking your own meals means that you can control how much salt you are adding, as well as increasing how many vegetables you can add to dishes. Drain and rinse canned vegetables and beans, which could reduce your salt intake from these products by up to 50%.
3. Flavour your food rather than adding salt:
Choose fresh or dried herbs, spices, garlic or lemon juice to ensure that your food doesn't taste bland.
4. Read the ingredients list:
If sodium or salt is listed in the first 3 ingredients, the food is likely to be a high-salt product. Salt may also be 'hidden' on the ingredients list as table salt, sodium chloride, monosodium glutamate (MSG), sodium nitrate, sodium bicarbonate and soy sauce – these are all salt too.
5. Read the label:
Some products may have a low salt, low sodium or no salt added version, but also be aware that these products may not necessarily be 'healthy' if they're also high in sugar or fat.

Total Permissible Sodium Content of Certain Foodstuffs

The Minister of Health published Regulations Relating to the Reduction of Sodium in Certain Foodstuffs and Related Matters in the *Government Gazette*.

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May 2021

Page 3

Peters, S.A.E., Dunford, E., Ware, L.J., Harris, T., Walker, A., Wicks, M., van Zyl, T., Swanepoel, B., Charlton, K.E., Woodward, M. Webster, J. & Neal, B. 2017.

Background: In June 2016, the Republic of South Africa introduced legislation for mandatory limits for the upper sodium content permitted in a wide range of processed foods. We assessed the sodium levels of packaged foods in South Africa during the one-year period leading up to the mandatory implementation date of the legislation.

Methods: Data on the nutritional composition of packaged foods was obtained from nutrition information panels on food labels through both in-store surveys and crowdsourcing by users of the HealthyFood Switch mobile phone app between June 2015 and August 2016. Summary sodium levels were calculated for 15 food categories, including the 13 categories covered by the sodium legislation. The percentage of foods that met the government's 2016 sodium limits was also calculated.

Results: 11,065 processed food items were included in the analyses; 1851 of these were subject to the sodium legislation. Overall, 67% of targeted foods had a sodium level at or below the legislated limit. Categories with the lowest percentage of foods that met legislated limits were bread (27%), potato crisps (41%), salt and vinegar flavoured snacks (42%), and raw processed sausages (45%). About half (49%) of targeted foods not meeting the legislated limits were less than 25% above the maximum sodium level.

Conclusion: Sodium levels in two-thirds of foods covered by the South African sodium legislation were at or below the permitted upper levels at the mandatory implementation date of the legislation and many more were close to the limit. The South African food industry has an excellent opportunity to rapidly meet the legislated requirements.

For the latest information regarding the Timeline for the reduction of total Sodium (Na) content of certain foodstuffs, kindly refer to **ANNEXURE 1:**

Methodology for Testing of Total Sodium

- (1) For all foodstuff categories, suitable sodium potentiometric method or elemental analysis, with either AA (flame atomic absorption spectroscopy) or ICP (inductively coupled plasma), for determining typical total sodium content which shall be applied for monitoring and law-enforcement purposes; provided that these methods shall also be used for routine testing or for the purpose of nutritional information labelling of the typical total sodium content by manufacturers. The samples shall be digested with a microwave digester and not ashing.
- (2) The permitted tolerance for nutrient declaration in the nutrition labelling of sodium where not claim with a nutrition or health message is made, shall be in accordance with the Regulations Relating to the Advertising and Labelling of Foodstuffs; Provided that where a claim with any nutrition or health message is made, the sodium value shall be at or below the sodium targets set out in these Regulations.

Salt and Cancer

Research has shown that rates of nasopharyngeal cancer are high in areas where Chinese-style salted fish is very common. Other studies have linked eating large amounts of foods preserved by salting and pickling with an increased risk of stomach cancer. The incidence of stomach cancer is

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May 2021

Page 4

greater in parts of the world (such as Japan) where diets traditionally include foods that are salt-preserved.

Risk factors in the general population for small intestine cancer include consumption of salted or smoked meats and fish.

Smyth, E.C., Nilsson, M., Grabsch, H.I., van Grieken, N.C. & Lordick, F. 2020.

“Gastric cancer is the fifth most common cancer and the third most common cause of cancer death globally. Risk factors for the condition include *Helicobacter pylori* infection, age, high salt intake, and diets low in fruit and vegetables. Gastric cancer is diagnosed histologically after endoscopic biopsy and staged using CT, endoscopic ultrasound, PET, and laparoscopy. It is a molecularly and phenotypically highly heterogeneous disease. The main treatment for early gastric cancer is endoscopic resection. Non-early operable gastric cancer is treated with surgery, which should include D2 lymphadenectomy (including lymph node stations in the perigastric mesentery and along the celiac arterial branches). Perioperative or adjuvant chemotherapy improves survival in patients with stage 1B or higher cancers. Advanced gastric cancer is treated with sequential lines of chemotherapy, starting with a platinum and fluoropyrimidine doublet in the first line; median survival is less than 1 year. Targeted therapies licensed to treat gastric cancer include trastuzumab (HER2-positive patients first line), ramucirumab (anti-angiogenic second line), and nivolumab or pembrolizumab (anti-PD-1 third line).”

Salt and Other Non-Communicable Diseases

Many lines of investigation provide evidence for the causal relationship between sodium (salt) intake and cardiovascular disease (CVD), which is the leading cause of death and disability worldwide. Raised blood pressure, cholesterol and smoking, are the major risk factors for CVD. Among these, raised blood pressure is the most important cause, accounting for 62% of strokes and 49% of coronary heart disease.

Kim, Y.B., Jung, W.W., Lee, S.W., Jin, X., Kang, H.K., Hong, E.H., Min, S.S., Kim, Y.S., Han, H.C., Colwell, C.S. & Kim, Y.I. 2020.

“Salt sensitivity of blood pressure (SSBP) is a trait carrying strong prognostic implications for various cardiovascular diseases. To test the hypothesis that excessive maternal salt intake causes SSBP in offspring through a mechanism dependent upon arginine-vasopressin (AVP), we performed a series of experiments using offspring of the rat dams salt-loaded during pregnancy and lactation with 1.5% saline drink ("experimental offspring") and those with normal perinatal salt exposure ("control offspring"). Salt challenge, given at 7-8 weeks of age with either 2% saline drink (3 days) or 8% NaCl-containing chow (4 weeks), had little or no effect on systolic blood pressure (SBP) in female offspring, whereas the salt challenge significantly raised SBP in male offspring, with the magnitude of increase being greater in experimental, than control, rats. Furthermore, the salt challenge not only raised plasma AVP level more and caused greater depressor responses to V1a and V2 AVP receptor antagonists to occur in experimental, than control, males, but it also made GABA excitatory in a significant proportion of magnocellular AVP neurons of experimental males by depolarizing GABA equilibrium potential. The effect of the maternal salt loading on the salt challenge-elicited SBP response in male offspring was precluded by maternal conivaptan treatment (non-selective AVP receptor antagonist) during the salt-loading period, whereas it was mimicked by neonatal AVP treatment. These results suggest that the excessive maternal salt intake brings about SSBP in male

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Page 5

offspring, both the programming and the expression of which depend on increased AVP secretion that may partly result from excitatory GABAergic action.”

Agócs, R., Sugár, D. & Szabó, A.J. 2020.

“The contribution of high sodium intake to hypertension and to the severity of immune-mediated diseases is still being heatedly debated in medical literature and in the lay media. This review aims to demonstrate two conflicting views on the topic, with the first part citing the detrimental effects of excessive salt consumption. Sodium plays a central role in volume and blood pressure homeostasis, and the positive correlation between sodium intake and blood pressure has been extensively researched. Despite the fact that the average of global daily salt consumption exceeds recommendations of international associations, health damage from excessive salt intake is still controversial. Individual differences in salt sensitivity are in great part attributed to this contradiction. Patients suffering from certain diseases as well as other vulnerable groups—either minors or individuals of full age—exhibit more pronounced blood pressure reduction when consuming a low-sodium diet. Furthermore, findings from the last two decades give insight into the concept of extrarenal sodium storage; however, the long-term consequences of this phenomenon are lesser known. Evidence of the relationship between sodium and autoimmune diseases are cited in the review, too. Nevertheless, further clinical trials are needed to clarify their interplay. In conclusion, for salt-sensitive risk groups in the population, even stricter limits of sodium consumption should be set than for young, healthy individuals. Therefore, the question raised in the title should be rephrased as follows: “how much salt is harmful” and “for whom is elevated salt intake harmful?””

Foods Rich in Sodium

Foods in their natural state contain very little sodium. Fast foods and processed foods are highest in sodium. Processed foods include snack foods, deli items, bakery products, canned foods and prepared foods like salad dressings and spaghetti sauce. Table salt, soy sauce and other condiments are high in sodium. Ordinary salt (table salt) is 40% sodium and 60% chloride.

More than 40% of the sodium comes from the following foods:

- Breads and rolls
- Cold cuts and cured meats (such as deli or packaged ham or turkey)
- Processed meats (such as sausages, bacon and ham)
- Pizza
- Fresh and processed poultry
- Soups
- Sandwiches and similar foods (such as hot dogs and hamburgers)
- Cheese (natural and processed)
- Mixed pasta dishes (such as lasagne, spaghetti with meat sauce, and pasta salad)
- Mixed meat dishes (such as meat loaf with tomato sauce, beef stew and chili)
- Snacks (such as chips (crisps), pretzels, popcorn, and crackers)

Sodium content can vary significantly within food categories – it is, therefore, necessary to make use of the Nutrition Facts Labels on products to compare the amount of sodium in different products of similar volume or weight. Always select products with the lowest sodium content.

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Page 6

Steps to Cut Down on Sodium Intake

Learning about the sodium in foods and new ways to prepare foods will help to achieve the desired sodium reducing goal.

- Read the Nutrition Facts Label to see how much Sodium is in the food
- Check the Nutrition Fact Label for lower Sodium choices and compare Sodium in different brands of foods — like frozen meals, packaged soups, breads, dressings/sauces and snack foods — and select those products with the lowest Sodium content
- Prepare own food whenever possible. Do not salt foods before or during cooking and limit salt shaker use at the table
- Add flavour without adding Sodium. Use herbs and spices instead of salt to add flavour to foods. Try rosemary, oregano, basil, curry powder, cayenne pepper, ginger, fresh garlic or garlic powder (not garlic salt), black or red pepper, vinegar or lemon juice, and no-salt seasoning blends
- Buy fresh or frozen (not processed) lean meat rather than canned, smoked or processed meats like luncheon meats, sausages, bacon and corned beef. Check the package on fresh meat and poultry to see if salt water or saline has been added
- Buy fresh, frozen (without sauce), or low Sodium or no-salt-added canned vegetables
- Rinse Sodium-containing canned foods, such as tuna, vegetables, and beans before using. This removes some of the Sodium
- Choose fat-free or low-fat milk and milk products, such as milk, yogurt, cheese and fortified soy beverages (often called soymilk) in place of processed cheese products and spreads, which are higher in Sodium
- Choose unsalted nuts and seeds, as well as snack products such as potato crisps and pretzels, that are marked 'low sodium' or 'no-salt-added' – or, better still, have a carrot or celery stick instead
- Sodium in soy sauce, ketchup, salad dressings, and seasoning packets can add up. Choose 'lite' or 'reduced sodium' soy sauce and 'no-salt-added' ketchup/tomato sauce, add oil and vinegar to a salad rather than bottled salad dressings and use only a small amount of seasoning from flavouring packets instead of the entire packet
- Ask to see the nutrition information in restaurants and choose a lower-sodium option. Ask for the meal to be prepared without salt and request that sauces and salad dressings be served 'on the side', to ensure less usage.

Medical Disclaimer

This Fact Sheet is intended to provide general information only and, as such, should not be considered as a substitute for advice, medically or otherwise, covering any specific situation. Users should seek appropriate advice before taking or refraining from taking any action in reliance on any information contained in this Fact Sheet. So far as permissible by law, the Cancer Association of South Africa (CANSA) does not accept any liability to any person (or his/her dependants/estate/heirs) relating to the use of any information contained in this Fact Sheet.

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May 2021

Page 7



ANNEXURE 1

REDUCTION OF TOTAL SODIUM (NA) CONTENT OF CERTAIN FOODSTUFFS

	Foodstuff category	Maximum Total Sodium per 100 g foodstuff	Dates on which the total Sodium reduction becomes effective
1.	Bread	400 mg Na 380 mg Na	30 June 2016 30 June 2019
2.	All breakfast cereals and porridges, whether ready-to-eat, instant or cook up, hot or cold	500 mg Na 400 mg Na	30 June 2016 30 June 2019
3.	All fat spreads and butter spreads	550 mg Na 450 mg Na	30 June 2016 30 June 2019
4.	Ready-to-eat savoury snacks, excluding salt-and-vinegar flavoured savoury snacks	800 mg Na 700 mg Na	30 June 2016 30 June 2019
5.	Flavoured potato crisps, excluding salt and-vinegar flavoured potato crisps	650 mg Na 550 mg Na	30 June 2016 30 June 2019
6.	Flavoured, ready-to-eat, savoury snacks and potato crisps – salted and salt-and-vinegar only	1000 mg Na 850 mg Na	30 June 2016 30 June 2019
7.	Processed meat (classes 1, 4 and 5), where products in category 5 relates to cured as per Annexure 1	1300 mg Na 1150 mg Na	30 March 2017 30 April 2020
8.	Processed meat (classes 2, 3 and 5) where products in category 1 relates to uncured as per Annexure 1	850 mg Na 650 mg Na	30 June 2016 30 April 2020

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May 2021

Page 8

9.	Raw-processed meat sausages (all types) and similar products	800 mg Na 600 mg Na	30 April 2020 30 April 2020
10.	Dry savoury powders (not the instant type) Includes dry soup /stew powders intended to be reconstituted, cooked up and consumed as a soup /stew and /or used to thicken and /or add flavour to any type of savoury dish, where a thickener is a significant ingoing ingredient.	5500 mg Na 3500 mg Na	30 June 2016 30 June 2019
11.	Dry gravy powders and savoury sauce powders, including all dry savoury gravy /sauce powders that require cooking or which are of the instant type, used as an accompaniment to a meal.	3500 mg Na 2000 mg Na	30 June 2016 30 June 2019
12.	Dry savoury powders with dry instant noodles to be mixed with a liquid Includes quick cooking Asian style noodles composed primarily of dry noodles with a seasoning sachet	1500 mg Na 800 mg Na	30 June 2016 30 June 2019
13.	Stock cubes, Stock powders, stock granules, stock emulsions, stock pastes or stock jellies Includes concentrated stocks / stew products in various formats used primarily to flavour savoury dishes	18000 mg Na 15000 mg Na	30 June 2016 30 June 2019



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Page 10

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Salt

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