

Changes in the salt levels in processed meat (2010-2017)

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Introduction

Sodium is a chemical element required by the body for many physiological functions including maintenance of blood volume and pressure. However, excess dietary sodium intake increases blood pressure and consequently increases the risk of cardiovascular diseases (CVDs).¹ In 2008, 30% of global deaths were related to CVDs, with 13% attributable to high blood pressure.² Salt, or sodium chloride, is the main source of dietary sodium.³ Correspondingly, salt reduction is an effective way to reduce non-communicable diseases such as CVDs by lowering blood pressure, as well as other complications associated with high salt intakes including chronic kidney disease, obesity, gastric cancer and liver diseases.⁴⁻⁷

In 2006, the World Health Organization (WHO) set a goal to reduce population salt intake to less than 5g/day.⁸ In Australia, the mean salt intake for adults is approximately 8-9g/day, exceeding the guideline.⁹ In 2009, the Australian government established the Food and Health Dialogue (FHD; succeeded by Healthy Food Partnership), with a plan for salt reduction in ten priority food categories.¹⁰ Further, in 2013, the World Health Assembly set a global salt reduction target to reduce salt intake by 30% by 2025, which the Australian government committed to.^{3,9} Following this, the Victorian Health Promotion Foundation (VicHealth) Salt Reduction Partnership Group was established to reduce the average salt intake for Victorians.¹¹

Processed meats were identified as a priority food category by the FHD for product reformulation and voluntary sodium targets were set, to be implemented before December 2013.^{10,12} Processed meats were defined as meat products containing at least 300g/kg meat, which have undergone

Tips for consumers

- Limit processed foods and meals where possible and increase consumption of fresh foods and vegetables.
- Be aware of portion size.
- Read the label choose the lower sodium option for example products which have less than 400mg per 100g.
- Download the Food Switch app to scan product barcodes to be directed to a product with a lower sodium content. Available to download from www.foodswitch.com.au
- Use the Australian Guide to Healthy Eating as a guide to make healthier choices www.eatforhealth.gov.au/guidelines/australian-guide-healthy-eating

a processing method other than boning, slicing, dicing, mincing or freezing.¹²

Processed meats were determined to be a priority for salt reduction as they contribute approximately 10% of daily sodium intake to the Australian diet, and make up an estimated 20% of the population's meat intake.¹³ The Australian Health Survey revealed almost 30% of people consume processed meats; with 12% consuming ham, 6% consuming sausages and 5% consuming bacon.¹³ Overall, the most commonly consumed processed meats were sausages (38%), ham and bacon (36%), luncheon meats (11%), salami (7%), and frankfurts (4%).¹³

This study aimed to assess the mean sodium levels in bacon, sausages, sliced meat, and ham based on 2017 data, to determine the changes in mean sodium levels sold between 2010 and 2017, and to calculate the percentage of products meeting the Australian FHD sodium target and the UK government salt reduction targets in 2017.

Methods:

Data Collection

Data, including all processed meat from 2010 and 2013 and 2015 were extracted from the Australian FoodSwitch database. Data from 2017 was collected from four major grocery retail stores (Coles, Woolworths, ALDI and IGA) in Sydney, Australia, using the protocol for data collection for the FoodSwitch database. Sodium data was obtained from the Nutrition Information Panel (NIP) and reported in milligram (mg) per 100g of food. Food product, manufacturer, brand and product name, and sodium content per 100g were recorded.

Categorisation

Processed meat was categorised using the Australian FoodSwitch database categorisation system and included: bacon, canned meat (beef, chicken, ham, other meat), dried meat, frozen and chilled meat, kebabs, meat burgers (beef, chicken, other meat), other meat products not otherwise specified, pate and meat spreads, raw flavoured meats (beef, chicken, lamb pork), raw unflavoured meats (beef, chicken, kangaroo, lamb, pork, veal), roast chicken, salami and cured meats, sausages and hotdogs, sliced meat (beef, chicken, ham, luncheon meat, meat variety packs, pork, turkey), whole hams and similar products. Frozen and chilled meat had the subcategories: coated/breaded frozen/chilled meat, meat with pastry, and uncoated frozen/chilled processed meat. Salami and cured meats were subcategorised into: cabanossi and twiggy sticks, chorizo, kransky, pancetta and prosciutto, polish salami, salami.

The FHD categorised processed meats into four categories: bacon, ham or other cured meat products, emulsified luncheon meats, and cooked or smoked sausages.

The UK salt targets categorized processed meats into 7 categories: bacon, ham or other cured meats, sausages, meat pies, cooked uncured meat, burgers and grill steaks, frankfurters, hotdogs and burgers.

Product inclusion and exclusion criteria

Only data for sausages, ham, sliced meat and bacon were included in this analysis

Products were excluded if there was no sodium in mg/100g value.

FHD categorised cooked or smoked sausages were excluded as there was no sodium target.

Analysis

The total number of products, products per category and per sub-category were recorded. The mean (SD) sodium content per 100g food, and range were determined for all processed meats, category and subcategories. Trends in mean sodium levels between 2010, 2013, 2015 and 2017, were determined for each category and subcategory. The proportion of products meeting targets were also derived for each year.

Statistical analyses were conducted in Stata 13. Alpha was set at a 0.05 significance level. One-way ANOVA's (post-hoc Scheffe) were performed to compare mean sodium content across the years.

Key Findings:

- 1014 sausages, bacon, sliced meat and whole ham (and similar) products were analysed from 2010-2017.
 - 272 products were included from 2017, 251 from 2015, 276 from 2013 and 215 from 2010.
- There has been an increase of 27% in products available in these categories between 2010 and 2017.
- Overall, there was a 17% reduction in the average salt content of bacon between 2010 and 2017, from 3.1g/100g to 2.6g/100g ($p < 0.001$).
- There was no significant decrease in the average salt content of sausages from 2010-2017.
- There is no overall decrease in salt content of sliced meat from 2010-2017. However there was an 18% decrease in the average salt content of sliced meats (excluding salami and cured meats) between 2010 and 2015 from 2.7g to 2.2g salt/100g ($p < 0.001$).
 - The greatest decrease in salt in sliced meats, 13%, was from 2010 to 2013 from 2.7g/100g to 2.4g/100g.
- There was no significant changes in the salt content of whole ham and similar products from 2013-2017 (NB. There was no data for whole ham in 2010).
- In 2017, Bacon had the highest salt content with an average salt contents of 2.6g/100g, meeting the FHD target. However there are huge ranges of salt contents of products within this category ranging from 1.65g to 3.7g/100g. 63% of products met the FHD target of 2.7g salt/100g.
- The average salt content of sausages in 2017 was 1.7g/100g, with salt contents ranging from 0.95g to 2.9g/100g. There are no FHD targets for sausages; 78% of products would exceed the UK salt target of which is 1.4g salt/100g
- The average salt content of sliced meat was 2.5g/100g, and ranged from 0.2g to 7g/100g.
- In 2017, the average salt content of whole hams and similar products was 2.6g/100g, ranging from 0.9g to 4.4g/100g. 82% of products met the FHD target.
- Based on the average serving size the average salt content per serve for bacon, sliced meat, ham and sausages were:
 - 1.2g for bacon and sliced meat - approximately one-quarter (24%) of the World Health Organization guideline of <5g/day.
 - 1.4g for sausages - approximately one-quarter (28%) of the World Health Organization guideline of <5g/day.
 - The average salt content of whole ham products was 2.0g per serve – 40% of the WHO daily limit (<5g salt/day).

- An average serving of the highest salt product would contain:
 - Bacon: 1.8g salt/serve
 - Sausage: 2.5g salt/serve
 - Sliced meat: 3.2g salt/serve
 - Whole ham and similar: 3.3g salt/serve
- In 2017, 63% of bacon products, 70% of sliced ham and 82% of whole ham products met the FHD target of less than 2.7g of salt/100g.
- In 2017, 78% of sausages exceeded the UK maximum salt target of 1.4g/100g, and the mean salt content of sausages exceeded the mean target by 54%. Further, the mean salt levels in sliced ham and whole hams exceeded the mean target by 54% and 60% respectively. On the other hand, the mean salt level in bacon was 9% lower than the mean UK target.

Examples of salt content of popular favourites using average salt contents for processed meat

Popular favourite	Components	Salt (g)	Percent WHO recommended daily intake (<5g salt)
Sausage in bread with BBQ sauce	1 sausage (84g) 1 slice white bread 1 Tbs BBQ sauce	2.91	58%
Sausage in bread with tomato sauce	1 sausage (84g) 1 slice white bread 1 Tbs tomato sauce	2.35	47%
Bacon & egg sandwich	1 serve bacon (48g) 2 slices white bread 1 egg 1 Tbs BBQ sauce	3.4	68%
Sliced meat sandwich e.g. ham	1 serve ham (46g) 2 slices white bread	2.0	40%

WHO – World Health Organization

Notes: average sodium data for popular favourites

- Sausage – average 691mg sodium/100g = 563mg sodium /serve = 1.40g salt
- White bread – average 424mg sodium/100g = 339mg/80g serve (1 slices) = 0.42g salt
- Tomato Sauce (Masterfoods) – 529mg sodium/100g = 212mg/1Tbs serve = 0.53g salt
- BBQ Sauce (Masterfoods) – 1091mg sodium/100g = 436mg/1Tbs serve = 1.09g salt
- Ham (46g) = 1009mg sodium/100g, 464mg/serve = 1.16g salt
- Bacon (48g) = 1047mg sodium/100g, 503mg/serve = 1.26g salt
- Egg = 136mg sodium/100g, 82mg/60g egg (1 egg) = 0.2g salt

Conclusion:

There is a wide range in salt content of processed meats, namely within the sausages, bacon, sliced meats and ham categories, which indicates that manufacturers can make these products with less sodium. There has been little progress over all on reduction of salt content of these products, which indicates the need for targets, and close monitoring of the food industry to meet these targets.

Recommendations:

- The high levels, and wide ranges of salt in processed meats highlights the need for progressively lower sodium targets for manufacturers to work towards to reduce the amount of sodium in these products.
- Regular monitoring of food supply is required to ensure the food industry meets the targets for sodium reduction.

About the WHO Collaborating Centre on Population Salt Reduction

The WHO Collaborating Centre on Population Salt Reduction (WHO CC SALT) has a global remit with a focus on Australia, the Western Pacific and South East Asian Regions. It is currently involved in projects in Australia, the Pacific Islands, Mongolia, Vietnam, Cambodia, Indonesia, China and India. WHO CC SALT is working with the World Health Organization to develop a range of tools and resources to support countries to develop and implement salt reduction strategies. WHO CC SALT is funded through a mixture of short and longer term contracts and research grants including National Health and Medical Research Council project and partnership grants and contract funding from the Victorian Health Foundation and the World Health Organization.

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References

1. Graudal NA, Hubeck-Graudal T, Jürgens G. Effects of Low-Sodium Diet vs. High-Sodium Diet on Blood Pressure, Renin, Aldosterone, Catecholamines, Cholesterol, and Triglyceride (Cochrane Review). *American Journal of Hypertension*. 2012;25(1):1-15.
2. World Health Organization. *Global status report on noncommunicable diseases 2010*. Geneva, Switzerland: World Health Organization; 2011.
3. World Health Organization. *Global status report on noncommunicable diseases 2014*. Geneva, Switzerland: World Health Organization; 2014.
4. He FJ, MacGregor GA. A comprehensive review on salt and health and current experience of worldwide salt reduction programmes. *Journal of Human Hypertension*. 2009;23(6):363-84.
5. Ma Y, He FJ, MacGregor GA. High Salt Intake: Independent Risk Factor for Obesity? *Hypertension*. 2015;66(4):843-9.
6. Hope SF, Webster J, Trieu K, Pillay A, Ieremia M, Bell C, et al. A systematic review of economic evaluations of population-based sodium reduction interventions. *PLoS One*. 2017;12(3).
7. Schorling E, Niebuhr D, Kroke A. Cost-effectiveness of salt reduction to prevent hypertension and CVD: a systematic review. *Public Health Nutrition*. 2017;20(11):1993-2003.
8. World Health Organization. *Prevention of cardiovascular disease: guidelines for assessment and management of cardiovascular risk*. Geneva: World Health Organization; 2007.
9. Webster J, Trieu K, Dunford E, Nowson C, Jolly K-A, Greenland R, et al. Salt reduction in Australia: From advocacy to action 2015. 207-18 p.
10. Government A. *Food and Health Dialogue Canberra, Australia: Commonwealth of Australia; 2015* [Available from: <http://www.health.gov.au/internet/main/publishing.nsf/Content/fhd>].
11. Victorian Health Promotion Foundation. *Salt reduction in Victoria Victoria, Australia: Victorian Health Promotion Foundation; 2017* [Available from: <https://www.vichealth.vic.gov.au/programs-and-projects/salt-reduction>].
12. Government A. *Food Category Targets and Action Plans - Processed Meat Canberra, Australia: Commonwealth of Australia; 2016* [Available from: <http://www.health.gov.au/internet/main/publishing.nsf/Content/pm>].
13. Australian Bureau of Statistics. 4364.0.55.007 - *Australian Health Survey: Nutrition First Results - Food and Nutrients, 2011-12*. In: Statistics ABo, editor. Canberra, Australia: Commonwealth of Australia; 2014.
14. Haskelberg H, Neal B, Dunford E, Flood V, Rangan A, Thomas B, et al. High variation in manufacturer-declared serving size of packaged discretionary foods in Australia. *The British journal of nutrition*. 2016;115(10):1810.

Table 1: Average salt content per category and sub-category for processed meats

Year	2010: Sodium, mg/100g (Salt, g/100g)			2013: Sodium, mg/100g (Salt, g/100g)			2015: Sodium, mg/100g (Salt, g/100g)			2017: Sodium, mg/100g (Salt, g/100g)		
	Product count	Mean	Range	Product count	Mean	Range	Product count	Mean	Range	Product count	Mean	Range
Bacon	46	1259 (3.1)	680-1950 (1.7-4.9)	52	1161 (2.9)	499-2170 (1.2-5.4)	56	1152 (2.9)	597-2900 (1.5-7.3)	59	1047 (2.6)	660-1490 (1.7-3.7)
Sausages	83	800 (2.0)	269-7260 (0.7-18.2)	89	636 (1.6)	410-1100 (1.0-2.8)	58	710 (1.8)	327-1600 (0.95-4.0)	81	691 (1.7)	383-1170 (0.95-2.9)
Sliced meat (excluding salami and other cured meat)	86	1086 (2.7)	120-2800 (0.3-7.0)	109	947 (2.4)	72-1710 (0.2-4.3)	125	890 (2.2)	0-1500 (0.0-3.8)	103	1009 (2.5)	82-2800 (0.2-7.0)
Whole hams and similar products	N/A	N/A	N/A	26	1090 (2.7)	450-1580 (1.1-4.0)	12	1147 (2.9)	387-1760 (1.0-4.4)	29	1045 (2.6)	368-1760 (0.9-4.4)

Table 2: Pack size and serving size, by category and subcategory, for processed meat

	Pack size				Serve size			
	N	Mean (SD)	Min	Max	N	Mean (SD)	Min	Max
Bacon	59	472 (329)	175	1000	59	48 (7)	25	55
Sausages	75	578 (315)	200	1800	80	84 (28)	34	170
Sliced meat (excluding salami and other cured meat)	96	229 (211)	80	1000	103	46 (15)	16	100
Whole hams and similar products	4	541 (214)	340	750	27	76 (39)	30	150

Table 3: Comparison of sodium content in processed meats in 2017 against FHD Targets

	N	Target for Max Salt (g/100g)	N meeting target	Percentage meeting target (%)	108
Bacon	59	2.7	37	63%	121
Sliced ham	61	2.7	43	70%	207
Whole hams and similar products	22	2.7	18	82%	436

Table 4: Comparison of sodium content in processed meats in 2017 against UK Targets

	N	Target for mean salt (g/100g)	Mean salt (g/100g)	% Difference	Target for Max salt (g/100g)	N meeting target	Percentage meeting target (%)
Bacon	59	2.9	2.6	-9%			
Ham	90	1.6	2.7	64%			
Sliced ham	61	1.6	2.5	54%			
Whole hams and similar products	29	1.6	2.6	60%			
Sausages	81	1.1	1.7	54%	1.4	18	22%