

Key Findings Report: Changes in sodium levels of bread products in Australia (2010-2017)

Key Findings:

- Average sodium content of bread and bread rolls (value added) decreased from 2010 – 2017 by 30% (522-366mg/100g) in morning goods by 14% (534-461mg/100g), and in bread and bread rolls by 10% (456mg-408mg/100g).
- 81% of breads in 2017 with FHD targets met the targets compared to 37% in 2010 which demonstrates that bread manufacturers are working towards meeting the targets.
- However, the FHD targets covered only two thirds of the products collected in 2017. Only 49% of the products not currently covered by the targets would meet the targets. This highlights the need for targets for all bread products as bread is currently the biggest contributor of salt to the Australian diet.
- Only 25% of breads in Australia would meet the UK's 2017 average salt targets - which cover the entire product category.
- There is huge range in sodium levels of bread products, for example, sodium content in bread and bread roll range from 200-880g/100g. Rye bread contained on average 468mg/100g (range 233-660mg/100g). These breads are often considered healthy options, so consumers would be surprised they contain high levels of sodium.
- Flat breads had the highest average sodium content in all breads in 2017 (540mg/100g); over a third more sodium than the FHD maximum salt target (400mg/100g), with some flat breads, such as Mission's Garlic Chapatti's containing more than double the target (930mg/100g).
- Wraps, within the flat bread category, contain high levels of sodium with average sodium content 564mg/100g in 2017, 33% more sodium than average sodium in sliced white bread (424mg/100g).
- Average sodium content in Mountain Bread Company wraps has increased by 30% from 2010 – 2017 (333-432mg/100g), with the biggest increase in sodium seen in Mountain Bread Rye Wraps (14%).
- The average sodium content of wraps by Gruma Oceania (Mission) in 2017 was more than double the FHD target. 45% of products were above the category average sodium content (564mg/100g) in 2017, containing 816mg sodium/100g, despite a reduction in average sodium from 2010 (882mg/100g - 816mg/100g).
- The wide range of sodium in bread products demonstrates that manufacturers are able to produce products with far less sodium:
 - For example, 2 slices of Schwob's white sourdough contains 910mg sodium (2.3g of salt), almost a HALF of daily recommended maximum salt intake (<5g), and almost 80% more salt than 2 slices of a similar bread made by Aldi's Baker's Life Super Soft White Sandwich Bread Sliced (210mg sodium, 0.5g of salt). In fact, Schwob's Dark Rye sourdough contains double the amount of salt as a serving of Kettle's sea salt chips (The average serving of Kettle original sea salt crisps contain 0.55g salt per 45g serving. Which is equal to 1.2 g/100g).

- Similarly, the salt content of one Mission Wholegrain wrap (646mg sodium, 1.6g salt/serving) is 8 TIMES more than one Vitastic Sorj Healthy Soft Wrap Wholemeal (68mg sodium, 0.2g salt/ serving)(Table 6).
- Gluten free breads were excluded from FHD targets, 29% contain sodium levels greater than the 400mg/100g sodium target with some containing as much as double the FHD target (880mg/100g – Gluten Free Crostini Bread Rolls).

Background:

Cardiovascular disease is the leading cause of non-communicable disease (NCD) deaths worldwide (1). Excess dietary salt intake increases blood pressure (2), and the risk of stroke and cardiovascular disease (3). Globally, it has been estimated that more than 1.65 million cardiovascular deaths per year are attributed to excess dietary salt intake (4).

Reducing salt intake is one of the most cost-effective public health interventions to reduce the global burden of non-communicable disease (NCDs); by lowering blood pressure, and thereby reducing the risk of stroke and heart disease deaths (5). Many countries are working towards achieving the global target of a 30% relative reduction in mean population salt intake towards the World Health Organisation (WHO) <5g target (6). The World Health Organization Collaborating Centre for Population Salt Reduction at the George Institute for Global Health in Sydney has a remit to support countries to achieve this target including developing programs of work to reduce salt levels in food.

Average salt intake in Australia is 8-9g salt per day, almost DOUBLE the WHO <5 recommendation (7). According to the most recent Australian Health Survey, the highest contributors of salt to the diet include bread and bread rolls (12.8%), processed meat (6.7%), ready to eat breakfast cereals (2-3%) and sauces, dips and condiments (6%) (8). Given the frequency of consumption of bread as well as its contribution of salt to the diet, reformulating bread to contain less sodium offers a good opportunity to reduce population level salt intake.

In 2009, The Australian Food and Health Dialogue (FHD) (since superseded by the new government's Healthy Food Partnership) set voluntary sodium reduction targets to be achieved in three major food categories (ready to eat breakfast cereals, breads and processed meats) by the end of 2013 (9). The UK government has a broader range of targets for the food industry to achieve by 2017 (10).

This aim of this study was to analyse the changes in sodium levels in bread products sold in Australia in 2010, 2013, 2015 and 2017, and compare these levels against the Australian FHD targets and against the UK 2017 salt targets. This was with the view to understanding the current levels of sodium levels in bread in Australia and inform direction for future reformulation efforts.

Methods:

Data Collection

Data collected in 2010, 2013 and 2015, was extracted from existing food composition databases for Australia and additional data for 2017 was collected specifically for this project using the protocol for data collection for the food composition database (11). Specific data extracted for bread products included: manufacturer name, brand name, product name, pack size, serving size, categorisation filters and sodium mg/100g.

Product Inclusion and Exclusion Criteria

Products were included if they fell within the bread and bread rolls, bread and bread rolls value added, flat breads and morning goods categories. Products such as pizza bases, ice-cream cones, poppadums and croutons were excluded. In addition, bread products that did not have any sodium mg/100g values or displayed erroneous data errors in that the sodium level reported was implausible were also excluded.

Categorisation

Four main bread categories: bread and bread rolls, bread and bread rolls (value added for example with additions such as garlic, olives, cheese etc.), flat breads and morning goods were defined in line with FHD and UK 2017 salt target categories for bread (10,12).

Data analysis

The total number of products in each category and sub-category for each year were recorded. The mean sodium levels and ranges of sodium (mg/100g) were calculated for each bread category and sub-category for each year (2010, 2013, 2015 and 2017). Trends in the sodium levels of the bread categories were assessed and mean sodium values were compared against FHD salt targets as well as UK2017 salt targets. The proportion of bread products meeting or below FHD and UK salt targets was derived for products that met the FHD and UK definitions for bread. Additionally, trends in manufacturer sodium levels from 2010-2017 were also recorded.

Results:

Data was collated for 1439 bread products from 2010 (237 products), 2013 (445 products), 2015 (394 products) and 2017 (363 products) (Table 1).

Products captured by the FHD targets include: – bread rolls, fruit bread, multigrain bread, other grain breads, rye bread, soy and linseed bread, white bread, wholemeal bread, bagels, crumpets and English muffins. The UK salt targets covered a broader range of bread products on the market including flat breads, bread and bread rolls (value added) and other plain breads.

Changes in salt levels in bread over time

Overall sodium content of bread and bread rolls, bread and bread rolls (value added) and morning goods decreased from 2010 to 2017 (456-408mg/100g; 10%, 522-366mg/100g; 30% and 534-461mg/100g; 14% respectively) (Figure 1). However, the mean sodium content of flat bread increased overall from 478mg/100g to 540mg/100g between 2010 and 2017. Sodium levels in pita bread, in the flat bread category, declined from 399 – 343mg/100g from 2010-2017.

Range and sodium levels in bread:

There was a wide range of sodium content of breads across all bread categories in all years. In 2017, flat bread had the highest mean sodium of all bread products (540mg/100g with a range of 29 – 930mg/100g). Followed by morning goods (461mg/100, range 229-674mg/100g), bread and bread rolls (408mg/100g, range 200-900mg/100g) and bread and bread rolls (value added) (366mg/100g range 174 -720mg/100g) (Table 1).

Percentage of products that meet targets in 2017:

Comparison against FHD Targets

166 products from a total of 363 products were covered by the FHD targets. 81% of these products met the FHD salt reduction target of maximum 400mg sodium per 100g in 2017 (Table 2). 85% of bread and bread rolls met the FHD target. However, 22% of bread rolls and 20% of mixed grain breads still did not meet the target (Table 2).

Only 44% of morning goods met the FHD maximum salt target of 400mg sodium per 100g. All English muffins met the target. However only 60% of bagels and none of the crumpet category met the target.

The proportion of products in the bread and bread roll category which met the FHD salt target increased from 37% in 2010 to 81% in 2017. In contrast little change has occurred in the morning goods category (i.e. bagels, crumpets and English muffins) from 2010 to 2017, with compliance only increasing by 0.9%.

54% of all products were not covered by the FHD targets. 49% (96 out of 197 products) of these would meet the target, a total of 26% of the total number of products collected in 2017. Of all 363 products surveyed in 2017 (both those covered and those not covered by the FHD), only 64% would meet the FHD target.

Comparison against UK 2017 Salt Targets

All 363 products were covered by the UK 2017 average salt targets (compared to 167 covered by FHD targets). Overall, only 20% of bread and bread rolls, and 71% of bread and bread rolls (value added) surveyed in 2017 met or were below the UK average sodium target of 360mg sodium/100g and 400mg/100g respectively. 0% of morning goods (yeast raised), and 47% of morning goods (powder raised) met the UK average sodium target of for these categories (290mg/100g and 450mg/100g respectively).

Changes in manufacturer sodium levels:

Leading bread manufacturers have decreased overall average sodium of their bread products - Coles (501-398mg/100g), Aldi (464-386mg/100g), Woolworths (430-390mg/100g), George Weston (470-388mg/100g), Goodman Fielder (463-411mg/100g) and MEB foods (361-271mg/100g). There is little evidence of a systematic reformulation effort by all manufacturers; some manufacturers demonstrated an increase in average sodium content of breads from 2010 to 2017, such as Mountain Bread Company (333mg/100g to 432mg/100g; 30%), Old Time Bakery (110mg/100g to 294mg/100g; 167%) and Freedom Foods (535mg/100g to 584mg/100g; 9%).

Recommendations:

- Further sodium reduction in breads, and across the whole bread range are needed to reduce population level salt consumption.
- Salt targets with transparent monitoring systems are needed to ensure manufacturers reduce the amount of sodium in bread, to reduce population level salt intake, and save the maximum number of lives.
- Reformulation targets need to be extended to categories not captured by the FHD (i.e. flat breads and bread and bread rolls (value added), to ensure all products are reformulated to contain less sodium, and have the greatest impact on population health.

Recommendations to consumers

- Bread is a significant contributor to salt in the diet so always check the label or use FoodSwitch - a smartphone app that allows consumers to get immediate, easy-to-understand information about packaged food products as well as a list of similar foods that are healthier choices. Available to download from <http://www.foodswitch.com.au>
- Use low salt spreads and fillings when making a healthy nutritious meal or snack.
- The best way to reduce salt is to eat more fresh foods and reduce reliance on processed foods

Limitations of the research:

The number of bread products captured by the FoodSwitch data do not necessarily represent a complete coverage of the bread supply within Australia, but rather those captured at specific time points during surveys, and limited to a subset of food retailers.

Table 1: Overview of the sodium content (mean, minimum & maximum) of bread categories and sub-categories in 2010, 2013 and 2015, 2017.

BREAD CATEGORIES	2010 SODIUM LEVELS (mg/100g)				2013 SODIUM LEVELS (mg/100g)				2015 SODIUM LEVELS (mg/100g)				2017 SODIUM LEVELS (mg/100g)			
	Mean	Minimum	Maximum	Product Count	Mean	Minimum	Maximum	Product Count	Mean	Minimum	Maximum	Product Count	Mean	Minimum	Maximum	Product Count
Bread and bread rolls	456.2	170	770	142	416.1	180	800	268	405.3	195	990	253	407.8	200	880	229
Bread rolls	523.1	317	701	27	406.8	181	597	47	379.0	259	540	42	416.3	264	880	35
Fruit bread	269.4	170	375	8	319.5	180	593	21	325.2	226	438	17	272.3	200	326	15
Mixed grain bread	468.4	235	770	40	436.4	195	800	93	417.4	195	660	96	408.7	233	660	85
Mixed grain sourdough	395.7	235	502	3	358.9	230	567	8	395.9	242	633	9	392.8	237	561	11
Multigrain bread	445.9	377	620	13	403.2	280	620	41	386.0	237	620	47	393.1	283	620	41
Other grain breads	583.3	400	770	3	495.7	293	800	14	467.9	315	600	9	372.4	280	460	5
Rye bread	480.7	390	660	16	487	195	660	20	463.1	195	660	19	468.0	233	660	17
Soy & linseed bread	462	400	610	5	450	390	610	10	446.0	400	610	12	407.9	344	610	11
Other plain bread (i.e. Turkish bread, baguettes, ciabatta, focaccia)	532.4	293	662	10	426.4	181	565	30	458.5	350	990	23	455.0	350	600	20
White bread	434.8	250	561	41	428.2	282	650	52	412.2	263	650	49	424.2	336	650	47
Wholemeal bread	413.6	243	470	16	401.8	243	500	25	395.2	232	625	26	405.4	232	653	27
Bread and bread rolls (value added)	522.1	150	668	26	528	150	820	42	534.0	154	782	35	365.5	174	720	28
Garlic bread	545.5	350	668	19	551.8	434	668	29	560.9	380	670	21	390.0	380	400	2
Other savoury bread	482.5	150	668	6	539.4	150	820	9	539.2	328	782	10	535.2	423	720	6
Other sweet bread	315	315	315	1	329.3	250	400	4	379.5	260	450	4	302.7	174	450	20

Flat bread	477.7	110	930	46	562.8	110	1100	105	548.8	29	1020	87	363.4	29	930	85
Naan	420	380	460	2	592	350	810	11	620.0	363	840	7	580.0	580	580	1
Pita bread	398.5	230	574	17	378.7	230	581	24	314.2	206	550	14	343.0	206	550	20
Regular flat bread (i.e. wrap breads)	521.8	110	930	25	560.6	110	1100	48	547.7	92	1020	46	563.8	57	920	48
Roti					710.5	300	1000	10	764.2	446	930	5	858.3	805	930	3
Tortillas	658	518	798	2	789.8	510	900	12	666.1	29	920	15	675.8	29	920	13
Morning goods	534.4	360	700	23	492.9	260	674	30	505.7	330	700	19	461.3	229	674	21
Bagels	673.3	657	700	4	440.4	260	674	7	533.8	399	674	4	477.3	328	674	6
Crumpets	637	600	683	9	606.6	500	650	13	612.0	500	700	8	585.5	470	626	8
English muffins	386.5	360	400	10	381.8	330	450	10	368.3	330	400	7	305.6	229	444	7
Grand Total	475.2	110	930	237	466.4	110	1100	445	451.8	29	1020	394	438.3	29	930	363

Table 2: Proportion of bread products, both captured and uncaptured by the FHD definition, compliant with the FHD maximum sodium target for bread (400mg/100g) in 2017

Covered by FHD target	Bread category	Minor category	Number of products > 400mg/100g	Number of products ≤ 400mg/100g	Number of products	% non-compliance	% compliance	
Yes	Bread and bread rolls		21	127	148	14	86	
		Bread rolls	6	21	27	22	78	
		Fruit bread	0	13	13	0	100	
		Mixed grain bread	11	43	54	20	80	
		White Bread	2	30	32	6	94	
		Wholemeal bread	2	20	22	9	91	
		Morning goods		10	8	18	56	44
			Bagels	3	2	5	60	40
			Crumpets	7	0	7	100	0
			English muffins	0	6	6	0	100
	TOTAL		31	135	166	19	81	
No	Gluten free	Mixed grain, white, wholemeal, fruit bread, bagels, bread rolls, crumpets, English muffins	9	25	34	26	74	
	Sourdough	Bread rolls, mixed grain bread, white bread, wholemeal bread	19	11	30	63	37	
	Flatbread		56	29	85	66	34	
		Naan	1	0	1	100	0	
		Regular flat bread	35	13	48	73	27	
		Pita bread	5	15	20	25	75	
		Roti	3	0	3	100	0	
		Tortillas	12	1	13	92	8	
		Bread and bread rolls (value added)		8	20	28	29	71
			Garlic bread	0	2	2	0	100
			Other savoury breads	6	0	6	100	0
		Other sweet breads	2	18	20	10	90	
	Bread and bread rolls	Other plain breads	9	11	20	45	55	
	TOTAL		101	96	197	51	49	

Table 3: The five highest and lowest salt levels in sliced breads products (white, wholemeal and mixed grain) per 100g (2017).

5 HIGHEST SALT SLICED BREADS					
Product name	Manufacturer	Serving size	Sodium (mg/100g)	Salt (g/100g)	Sodium (salt g) per serving
Schwob's Dark Rye	Schwob's Swiss Bakery	70g (1 slice)	660	1.7	462 (1.2)
Bowen Island Artisan Breads Wholemeal Sourdough	Bowen Island Artisan Breads	45g	653	1.6	294 (0.7)
Schwob's White Sourdough	Schwob's Swiss Bakery	70g (1 slice)	650	1.6	455 (1.1)
Schwob's Swiss Farmers Light Rye	Schwob's Swiss Bakery	70g (1 slice)	620	1.6	434 (1.1)
Schwob's Swiss Bakery Multigrain	Schwob's Swiss Bakery	70g (1 slice)	620	1.6	434 (1.1)
5 LOWEST SALT SLICED BREADS					
Product name	Manufacturer	Serving size	Sodium (mg/100g)	Salt (g/100g)	Sodium (g) per serving
Bill's Certified Organic 100% Wholemeal Sourdough	Bill's Certified Organic Health Bakery	40g	232	0.6	92 (0.2)
Bill's Certified Organic Medium Rye Sourdough	Bill's Certified Organic Health Bakery	40g	233	0.6	93 (0.2)
Bill's Certified Organic Ancient Grains + Activated Super Seeds Sourdough	Bill's Certified Organic Health Bakery	40g	237	0.6	95 (0.2)
Bills Organic Multigrain Sourdough	Bills's Certified Organic Health Bakery	40g	242	0.6	97 (0.2)
Bill's Certified Organic Activated 7 Seeds Multigrain Sourdough	Bill's Certified Organic Health Bakery	40g	242	0.6	97 (0.2)

Table 4: The highest and lowest salt containing flat bread products (naan, wraps, tortillas, roti and pita bread) per 100g available in 2017.

5 HIGHEST SALT FLAT BREADS					
Product name	Manufacturer	Serving size	Sodium (mg/100g)	Salt (g/100g)	Salt (g) per serving
Mission Chapattis Garlic	Gruma Oceania Pty Ltd	46g	930	2.3	1.1
Mission Wraps Zesty Garlic Herb	Gruma Oceania Pty Ltd	71g	920	2.3	1.6
Coles Tortillas	Coles	40g	920	2.3	0.9
Mission Wraps Lite Super soft	Gruma Oceania Pty Ltd	71g	910	2.3	1.6
Mission Wraps Whole Grain	Gruma Oceania Pty Ltd	71g	900	2.3	1.6
5 LOWEST SALT FLAT BREADS					
Product name	Manufacturer	Serving size	Sodium (mg/100g)	Salt (g/100g)	Salt per serving
Mission White Corn Tortillas	Gruma Oceania Pty Ltd	26g	29	0.1	0.0
Old Time Bakery Wholesome Gluten Free Wraps	Old time Bakery Pty Ltd	62.5g	57	0.1	0.1
Vitastic Sorj Healthy Soft Wraps Rye	MEB Foods Pty Ltd	38g	120	0.3	0.1
Vitastic Sorj Healthy Soft Wraps Wholemeal	MEB Foods Pty Ltd	38g	180	0.5	0.2
MEB Pita Bread Wholemeal	MEB Foods Pty Ltd	80g	206	0.5	0.4

References:

1. Non communicable diseases [Internet]. World Health Organization. 2015 [cited 2 March 2017]. Available from: <http://www.who.int/mediacentre/factsheets/fs355/en/>
2. Stamler J. The INTERSALT Study: background, methods, findings, and implications. *The American Society for Clinical Nutrition*. 1997;65(2):626S-642S.
3. Alderman MC, Cohen H. Dietary Sodium Intake and Cardiovascular Mortality: Controversy Resolved?. *Current Hypertension Reports*. 2012;14(3):193-201.
4. Mozaffarian D, Fahimi S, Singh G, Micha R, Khatibzadeh S, Engell R et al. Global Sodium Consumption and Death from Cardiovascular Causes. *New England Journal of Medicine*. 2014;371(7):624-634.
5. Salt reduction [Internet]. World Health Organization. 2016 [cited 16 March 2017].
6. Trevena, Helen et al. "An Evaluation Of The Effects Of The Australian Food And Health Dialogue Targets On The Sodium Content Of Bread, Breakfast Cereals And Processed Meats". *Nutrients* 6.9 (2014): 3802-3817.
7. Webster J, Trieu K, Dunford E, Nowson C, Jolly K, Greenland R, Riemers J and Bolam B. Salt reduction in Australia: from advocacy to action. *Cardiovascular Diagnosis and Therapy*. 2015;5:207-18.
8. "4364.0.55.007 - Australian Health Survey: Nutrition First Results - Foods And Nutrients, 2011-12". *Abs.gov.au*. Australian Bureau of Statistics., 2017. Web. 12 Feb. 2017.
9. Trevena, Helen et al. "An Evaluation Of The Effects Of The Australian Food And Health Dialogue Targets On The Sodium Content Of Bread, Breakfast Cereals And Processed Meats". *Nutrients* 6.9 (2014): 3802-3817.
10. Salt Targets | Food Standards Agency [Internet]. Food.gov.uk. [cited 6 March 2017]. Available from: <https://www.food.gov.uk/northern-ireland/nutritionni/salt-ni/salt-targets>
11. Dunford, Elizabeth et al. "Foodswitch: A Mobile Phone App To Enable Consumers To Make Healthier Food Choices And Crowdsourcing Of National Food Composition Data". *JMIR mHealth and uHealth* 2.3 (2014): e37. Web.
12. Healthy Food Partnership Evaluation Report [Internet]. Australian Government Department of Health. 2017 [cited 14 February 2017]. Available from: [http://www.health.gov.au/internet/main/publishing.nsf/Content/7BD47FA4705160A6CA25800C008088B9/\\$File/Healthy%20Food%20Partnership%20Evaluation%20Report_Heart%20Foundation.pdf](http://www.health.gov.au/internet/main/publishing.nsf/Content/7BD47FA4705160A6CA25800C008088B9/$File/Healthy%20Food%20Partnership%20Evaluation%20Report_Heart%20Foundation.pdf)