

The Sodium Content of Sausages in New Zealand, 2013 – 2019



Report prepared for the Stroke Foundation of New Zealand by the DIET Programme Team at
the National Institute for Health Innovation (NIHI)

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RECOMMENDATIONS

For consumers

- Limit intake of processed meats and increase consumption of whole, fresh alternatives.
- Read food labels and select lower sodium options. Choose sausages that contain less than 650mg sodium/100g.
- Be aware of portion size.

For the food industry

- The high levels and wide range of sodium in sausages highlight the need for, and feasibility of, reductions in the amount of sodium in these products.

For government

- Introduce government-led sodium targets for a range of key food categories in New Zealand
- Regular, independent monitoring of the food supply is needed to ensure that the food industry is working towards meeting voluntary targets for sodium reduction.

INTRODUCTION

Stroke is New Zealand's (NZ) second single biggest killer and the leading cause of serious adult disability. Each year, over 11,000 New Zealanders have a stroke.¹ Māori and Pasifika are more likely to experience a stroke than NZ Europeans and also tend to experience stroke at a much younger age – approximately 15 years younger than NZ Europeans.² Around 90% of the burden of stroke is due to modifiable risk factors.³ High blood pressure is the leading modifiable risk factor for stroke and the most preventable cause of stroke worldwide. A person with high blood pressure is up to four times more likely to have a stroke than someone with normal or low blood pressure.⁴ High dietary sodium intake is associated with high blood pressure and also directly related to cardiovascular disease risk, including stroke and myocardial infarction. The most recent estimate of population sodium intakes in NZ, based on the collection

of 24hr urine samples, reported a mean sodium excretion of 3386mg/day (equivalent to 8.5g of salt).⁵ The World Health Organization recommends a maximum dietary sodium intake of 2000 mg/day (5g of salt).⁶ In a Western style diet, around three-quarters of dietary sodium intake comes from processed foods, 10-15% comes from sodium naturally present in foods, 10-15% is added in cooking and at the table, and around 1% comes from drinking water.⁷ Research into the sodium content of processed foods suggests levels can vary significantly within food categories. For example, a Consumer NZ report⁸ found plant-based meat alternative products ranged from 78 mg sodium/100g to 900mg sodium/100g. Such variability indicates that lowering sodium levels is feasible without compromising product safety and palatability. In contrast to many other countries, NZ does not have a government-led salt reduction programme. The main national initiative to reduce the sodium content of NZ foods and population sodium intake is a food reformulation programme overseen by the NZ Heart Foundation, where voluntary targets are set to reduce the sodium content of foods in key categories.⁹ In Australia, the Healthy Food Partnership Programme, a public-private partnership between government, public health, and food industry, has also produced draft voluntary sodium reformulation targets.¹⁰ We aimed to examine the variability in sodium content of sausages sold in NZ, to determine if any progress has occurred in reducing sodium content over time, and to identify how many existing products meet the NZ Heart Foundation and Australian Healthy Food Partnership targets.

METHODS

Data Collection

Sodium content data, manufacturer recommended serving size, and pack size for sausages in 2013, 2016 and 2019 were extracted from the National Institute for Health Innovation (NIHI) Nutritrack database.¹¹ Nutritrack data are collected each year from four major supermarket stores (Countdown, New World, Pak'n'Save, Four Square) in Auckland, NZ.¹¹ Sodium data are collected from product Nutrition Information Panels (NIP) and reported in milligrams (mg) per 100g of food.

Product inclusion

We included meat sausages (beef, chicken, lamb, pork, and other [e.g. venison, black pudding]), cocktail sausages, hotdogs, cabonossi and twiggy sticks, kransky, and meat-free sausages.

Other processed meats, e.g. bacon, salami, chorizo, burgers, canned meat, and sliced deli meats, were excluded from this analysis.

Categorisation

Sausages were categorised systematically according to the established Nutritrack database classification system.

Product data extracted for analysis were quality checked before analysis. Any errors identified were corrected prior to data analysis.

Data analysis

The number of products available, their mean sodium content (mg/100g) and sodium ranges were determined for each product category in each year (2013, 2016 and 2019). Mean sodium values for meat sausages and cocktail sausages were compared against the NZ (Heart Foundation)¹² and Australian (Healthy Food Partnership)¹³ voluntary sodium targets (note, equivalent sodium targets do not exist for the other sausage categories included in our analysis). The proportions of products meeting targets were derived for each year.

Changes in the sodium content of products between years were examined using both parametric F-test (ANOVA) and non-parametric Kruskal Wallis tests. Since the

results of both tests were consistent, only the ANOVA test results are reported. Chi-square tests (or Fisher's exact test for categories containing <5 products) were used to determine if there were any differences in proportions of products meeting the targets across the three years.

All statistical analyses were conducted in SAS version 9.4 (SAS Institute Inc., Cary, NC, USA). P-values of <0.05 were considered statistically significant.

KEY FINDINGS

ALL SAUSAGE PRODUCTS

- In total, 496 sausage products were included in the analysis, representing all sausage products available for sale in NZ in 2013 (n=131), 2016 (n=210) and 2019 (n=155).
- The average sodium content of all sausage products decreased slightly from 825mg sodium/100g in 2013 to 801mg sodium/100g in 2019 (a 3% drop). The difference was not statistically significant, however (p=0.07).
- Manufacturer recommended serving sizes in 2019 ranged from 12g to 167g. The average recommended serving size was 84g.
- In 2019, the average sodium in an average recommended serving of sausage products was 673mg.
- The sodium content of sausage products in 2019 ranged widely, with the highest sodium sausage containing 2290mg sodium/100g. This represents nearly seven times more sodium than the lowest sodium sausage (330mg sodium/100g).
 - The highest sodium sausage (2290mg sodium per 100g) was in the cabanossi and twiggy stick category. Based on the recommended serving size (50g), one serving of this product would contain 1145mg sodium, more than half (57%) the maximum daily recommended intake.⁶

MEAT SAUSAGES (BEEF, CHICKEN, LAMB, PORK, OTHER)

- 322 sausages were included in the analysis, representing products available in 2013 (n=77), 2016 (n=148) and 2019 (n=96).
- The average sodium content of sausages decreased from 780mg sodium/100g in 2013 to 742mg sodium/100g in 2019 (a 5% drop). The difference was not statistically significant, however (p=0.27).
- Manufacturer recommended serving sizes in 2019 ranged from 30g to 167g. The average recommended serving size was 99g.
- In 2019, the average sodium in an average recommended serving of sausage products was 735mg.
- The sodium content of sausages in 2019 ranged widely, with the highest sodium product containing 1667mg sodium/100g. This represents nearly five times more sodium than that in the lowest sodium sausage (350mg sodium/100g).
 - The highest sodium sausage (1200mg sodium/100g) was in the 'other' sausage category (i.e. other meat sausages such as black pudding). Based on the recommended serving size (56g), one serving of this product would contain 672mg sodium, or about one third (33.6%) of the maximum daily recommended intake.
- Less than one third (32%) of sausages in 2019 met the NZ Heart Foundation sodium target of 650mg/100g. Just one in eight (12.5%) sausages met the Australian Healthy Food Partnership target of 540mg/100g.
- Despite increases over time in the proportion of sausages meeting targets, differences were not statistically significant for either the NZ (p=0.06) or Australian (p=0.19) target.

COCKTAIL SAUSAGES

- 26 cocktail sausages were included in the analysis, representing products available in 2013 (n=8), 2016 (n=11) and 2019 (n=7).
- The average sodium content of cocktail sausages decreased from 899mg sodium/100g in 2013 to 735mg sodium/100g in 2019 (an 18% drop). The difference was not statistically significant, however (p=0.19).
- Manufacturer recommended serving sizes in 2019 ranged from 29g to 81g. The average recommended serving size was 57g.
- The average sodium in an average recommended serving of cocktail sausages was 419mg.
- The highest sodium cocktail sausages in 2019 was 984mg/100g. This represents nearly twice the sodium content of the lowest sodium cocktail sausage (500mg sodium/100g).
- 57.1% of cocktail sausages in 2019 met the NZ Heart Foundation sodium target of 650mg/100g. Just 14.3% of cocktail sausages met the Australian Healthy Food Partnership target of 540mg/100g
- Despite increases over time in the proportion of cocktail sausages meeting targets, differences were not statistically significant for either the NZ (p=0.05) or Australian (p=0.57) target.

HOTDOGS

- 54 hotdogs were included in the analysis, representing products available in 2013 (n=17), 2016 (n=20) and 2019 (n=17).
- The average sodium content of hotdogs decreased from 840mg sodium/100g in 2013 to 718mg sodium/100g in 2019 (a 15% drop). The difference was not statistically significant, however (p=0.32).
- Manufacturer recommended serving sizes in 2019 ranged from 34g to 167g. The average recommended serving size was 67g.
- The average sodium in an average recommended serving of hotdogs was 481mg.

- The highest sodium hotdog in 2019 contained 1147mg/100, more than twice that of the lowest sodium product (490mg sodium/100g).

CABANOSSI AND TWIGGY STICKS

- 35 cabanossi and twiggy stick products were included in the analysis, representing products available in 2013 (n=11), 2016 (n=9) and 2019 (n=15).
- The average sodium content of cabanossi and twiggy sticks increased from 1203mg sodium/100g in 2013 to 1260mg sodium/100g in 2019 (a 5% rise). The difference was not statistically significant, however (p=0.36).
- Manufacturer recommended serving sizes in 2019 ranged from 12g to 50g. The average serving size was 30g.
- The average sodium in an average recommended serving of cabanossi and twiggy sticks was 378mg.
- The highest sodium product in 2019 contained 2290mg sodium/100g, almost three times more than that of the lowest sodium product (835mg sodium/100g).

KRANSKY

- 28 kransky products were included in the analysis, representing products available in 2013 (n=7), 2016 (n=11) and 2019 (n=10).
- The average sodium content of kransky increased from 952mg sodium/100g in 2013 to 1013mg sodium/100g in 2019 (a 6% rise). The difference was not statistically significant, however (p=0.60).
- Manufacturer recommended serving sizes in 2019 ranged from 28g to 100g. The average recommended serving size was 66g.
- The average sodium in an average recommended serving of kransky in 2019 was 672mg.
- The highest sodium kransky in 2019 contained 1200mg/100g, 25% more than lowest sodium kransky product (895mg sodium/100g).

MEAT-FREE SAUSAGES

- 32 meat-free products were included in the analysis, representing products available in 2013 (n=11), 2016 (n=11) and 2019 (n=10).
- The average sodium content of meat-free sausages increased from 607mg sodium/100g in 2013 to 643mg sodium/100g in 2019 (a 6% rise). The difference was not statistically significant, however (p=0.78).
- Manufacturer recommended serving sizes in 2019 ranged from 45-125g. The average serving size was 99g.
- The average sodium in an average recommended serving of meat-free sausages was 637mg.
- The highest sodium meat-free sausage in 2019 contained 810mg sodium/100g, almost two and half times that of the lowest sodium product (330mg sodium/100g).

CONCLUSION

The sodium content of NZ sausages is high (average 801mg/100mg in 2019) and there is significant variability in sodium content within categories and across brands (from as low as 330mg/100g to as high as 2290 mg/100g).

There has been no significant change in the sodium content of New Zealand sausages over the seven-year period between 2013 and 2019.

Less than one third of New Zealand meat sausages in 2019 met the Heart Foundation voluntary sodium target of 650mg/100g.

These findings highlight a lack of action by the food industry in response to voluntary targets. Government-established sodium targets for sausages and other processed foods are recommended.

LIMITATIONS OF THE RESEARCH

The number of sausage products in the Nutrtrack database is not necessarily representative of all products available in NZ because Nutrtrack data collections are

undertaken in four major supermarket stores in Auckland during the second quarter of each year.

The sodium information reported for products is based on composition “as sold” and does not reflect the nutrient profile of cooked products where water and nutrients, including sodium, are lost. For example, the NZ Food Composition Database lists the sodium content of pan-fried pork sausages as 634mg sodium per 100g compared with 760mg/100g for the raw product.¹⁴ Nevertheless, “as sold” sodium values provide a robust and consistent method to compare the sodium content of products across categories and over time.

Recommended serving sizes reported on-pack are not standardised and are estimated by product manufacturers. As a result, they vary substantially between manufacturer and over time. It should be noted that recommended serving size for most sausage products decreased between 2013 and 2019, and this was the major driver of observed reductions in sodium/serving over time (rather than reductions in sodium content per 100g).

NOTE

The equivalent salt content (g/100g) for reported sodium values can be estimated by multiplying the sodium content of products (mg/100g) by 2.5 and dividing by 1000.

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Table 1. Sodium content of New Zealand sausages, 2013 to 2019

	2013					2016					2019				
	Product count	Average pack size (g)	Mean sodium (range) (mg/100g)	Average serving size (g)	Mean sodium/serving (mg)	Product count	Average pack size (g)	Mean sodium (range) (mg/100g)	Average serving size (g)	Mean sodium/serving (mg)	Product count	Average pack size (g)	Mean sodium (range) (mg/100g)	Average serving size (g)	Mean sodium/serving (mg)
ALL SAUSAGE PRODUCTS	131	631	825 (61-1650)	100	825	210	677	767 (280-1400)	104	798	155	560	801 (330-2290)	84	673
Sausages	77	734	780 (303-1370)	122	952	149	758	744 (280-1370)	118	878	96	628	742 (350-1667)	99	735
Beef	9	674	650 (303-830)	130	845	41	697	684 (280-1370)	121	828	16	544	663 (514-880)	98	650
Chicken	7	892	822 (450-1370)	152	1249	9	785	856 (460-1040)	95	813	11	940	734 (477-895)	84	617
Lamb	2	467	768 (768)	167	1283	15	700	722 (508-913)	123	888	7	1007	658 (507-913)	96	632
Other	44	742	816 (375-995)	111	906	43	896	809 (400-1200)	113	914	33	659	781 (350-1200)	110	859
Pork	15	710	735 (375-1100)	126	926	40	683	718 (375-1100)	123	883	29	430	767 (450-1667)	93	713
Cocktail sausages	8	1176	899 (707-1020)	52	467	11	718	785 (500-1018)	70	550	7	877	735 (500-984)	57	419
Hotdogs	17	515	840 (61-1590)	83	697	20	630	754 (490-1060)	79	596	17	631	718 (490-1147)	67	481
Cabanossi and twiggly sticks	11	169	1203 (850-1650)	44	529	9	162	1039 (835-1400)	36	374	15	123	1260 (835-2290)	30	378
Kransky	7	266	952 (621-1070)	60	571	11	382	994 (873-1104)	64	636	10	431	1013 (895-1200)	66	669
Meat-free sausages	11	382	607 (400-810)	90	546	11	360	638 (460-810)	88	561	10	344	643 (330-810)	99	637

Table 2. Comparison of sodium in New Zealand sausages in 2019 with NZ Heart Foundation voluntary sodium targets

Food category	Total number of products	Mean of sodium content (mg/100g)	Heart Foundation recommended maximum level (mg/100g)	Number of products meeting the New Zealand target	Proportion of products meeting the New Zealand target
Sausages	96	742	650	31	32.3%
Beef	16	663	650	9	56.3%
Chicken	11	734	650	3	27.3%
Lamb	7	658	650	3	42.9%
Other	33	781	650	7	21.2%
Pork	29	767	650	9	31%
Cocktail sausages	7	735	650	4	57.1%
Total	103	742	650	35	34%

Table 3. Comparison of sodium in New Zealand sausages in 2019 with Australian Healthy Food Partnership sodium targets

Food category	Total number of products	Mean of sodium content (mg/100g)	Healthy Food Partnership recommended maximum level (mg/100g)	Number of products meeting the Australian target	Proportion of products meeting the Australian target
Sausages	96	742	540	12	12.5%
Beef	16	663	540	3	18.8%
Chicken	11	734	540	1	9.1%
Lamb	7	658	540	2	28.6%
Other	33	781	540	3	9.1%
Pork	29	767	540	3	10.3%
Cocktail sausages	7	735	540	1	14.3%
Total	103	742	540	13	12.6%

NIHI

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ENQUIRIES

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