



# food policy

WHO Collaborating Centre  
on Population Salt Reduction



THIS REPORT WAS PREPARED FOR THE VICHEALTH SALT PARTNERSHIP  
WORLD HEALTH ORGANIZATION COLLABORATING CENTRE ON POPULATION SALT  
REDUCTION, THE GEORGE INSTITUTE FOR GLOBAL HEALTH.



The George Institute  
for Global Health



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## **Key Findings Report: Changes in sodium levels of Asian style sauces in Australia (2010-2018)**

### ***Summary of surveyed products***

- 157 Asian style sauce products were analysed from 2010-2018, categorized as fish sauce, oyster sauce, and soy sauce.
  - 17 products were included in the analysis for 2010, 46 products in 2013, 43 products in 2015, and 51 products in 2018
- There were no significant changes in the average sodium content of Asian style sauces overall or any of the categories of Asian style sauces between 2010-2018.
- The average sodium content of Asian style sauces in 2018 was 5859mg/100mL [14.7g salt]; (range 1803-10882mg/100mL) [4.5-27.2g salt]
  - Per serving: average 869 mg of sodium [2.2g salt], or 43% recommended daily salt intake
  - Per tablespoon: average 1171mg of sodium [2.9g salt], or 59% of recommended daily salt intake

*\*To convert milligrams of sodium to grams of salt, multiply sodium by 2.5, then divide by 1,000: mg sodium x 2.5 = mg salt / 1,000*
- The largest range in sodium content was found in soy sauces from 3808-8762 mg/100mL [9.5-21.9g salt], followed by oyster sauces 1803-4770 mg/100mL [4.5-11.9g salt], and fish sauces 7992-10882 mg/100mL [19.9-27.2g salt].
- Serving size ranged from 5mL (1 teaspoon) – 20mL (1 tablespoon)
  - The average serving size for fish sauce was 16mL (15-20mL); oyster sauce 13mL (10-15mL) and 21g (15-37.5g); and soy sauce 14mL (5-20mL)

### ***Asian style sauces by subcategory***

#### ***Fish sauce***

- Fish sauce had the highest average sodium content of 9637 mg/100mL [24.1g salt]
  - Per serving: average 1530 mg of sodium [3.8g salt], or 77% recommended daily salt intake
  - Per tablespoon: average 1927 mg of sodium [4.8g salt], or 96% recommended daily salt intake
- Highest sodium content was found in *Ayam Fish Sauce*; 10,882 mg/100mL [27.2g salt]
  - Per serving: 1632 mg of sodium [4.1g salt], or 81% recommended daily salt intake
  - Per tablespoon: 2176 mg of sodium [5.4g salt], or 108% recommended daily salt intake
- Lowest sodium content was found in *Squid Brand Fish Sauce*; 7992 mg/100mL [19.9g salt]
  - Per serving: 1199 mg of sodium [3.0 g salt], or 60% recommended daily salt intake
  - Per tablespoon: 1598 mg of sodium [4.0g salt], or 79% recommended daily salt intake

#### ***Soy sauce***

- Soy sauces had an average sodium content of 6148 mg/100mL [15.4g salt]
  - Per serving: average 876 mg of sodium [2.2g salt], or 44% recommended daily salt intake
  - Per tablespoon: average 1229 mg of sodium [3.1g salt], or 61% recommended daily salt intake
- Highest sodium content was found in *Chang's Light Soy Sauce*; 8762 mg/100mL [21.9g salt]
  - Per serving: 1752 mg of sodium [4.4g salt], or 87% recommended daily salt intake
  - Per tablespoon: 1752 mg of sodium [4.4g salt], or 87% recommended daily salt intake

- Lowest sodium content was found in *Kikkoman Naturally Brewed Less Salt Soy Sauce*; 3808 mg/100 mL [9.5g salt]
  - Per serving: 571 mg of sodium [1.4g salt], or 28% recommended daily salt intake
  - Per tablespoon: 762 mg of sodium [1.9g salt], or 38% recommended daily salt intake

### **Oyster sauce**

- Oyster sauces had an average sodium content of 3604 mg/100mL [9.0g salt]
  - Per serving: average 570 mg of sodium [1.4g salt], or 28% recommended daily salt intake
  - Per tablespoon: average 721 mg of sodium [1.8g salt], or 36% recommended daily salt intake
- Highest sodium content was found in *Asia Specialties Oyster Sauce*; 4770 mg/100mL [11.9g salt]
  - Per serving: 978 mg of sodium [2.4g salt], or 48% recommended daily salt intake
  - Per tablespoon: 954 mg of sodium [2.4g salt], or 47% recommended daily salt intake
- Lowest sodium content was found in *Pandaroo Oyster Sauce*; 1803 mg/100mL [4.5g salt]
  - Per serving: 222 mg of sodium [0.6g salt], or 11% recommended daily salt intake
  - Per tablespoon: 361 mg of sodium [0.9g salt], or 18% recommended daily salt intake

### **Sodium targets**

- There are no sodium targets for sauces in Australia. However, comparing current sodium levels of these products to the AWASH target, it was found that:
  - In 2018, 39% percent of Asian style sauces met the AWASH target of 4840 mg/100g
  - By category, 0% of fish sauces, 19% of soy sauces, and 100% of oyster sauces met the target

### **Recommendations**

- **Government**
    - Establish specific salt targets for Asian style sauces in Australia.
    - Create a regulatory monitoring scheme to assess industry compliance with established salt targets.
    - Increase consumer awareness campaigns to inform about the health benefits of reducing salt intake.
  - **Industry:**
    - Gradually reformulate high salt products to lowest levels of salt possible.
    - Explore opportunities to produce 'reduced salt' sauce products
  - **Tips for consumers:**
    - Be aware of portion size and try to use sparingly.
    - Use natural, no-salt flavourings such as lemon, and herbs and spice including fresh garlic, chilli, ginger and vinegar when preparing Asian style meals.
    - Choose 'reduced salt' product and check the label to choose the lower sodium option.
    - There is also an app to help make healthier choice. Download the FoodSwitch app, which allows you to scan the barcode of the product and gives you instant, easy to understand nutrition information about the product, and suggest healthier alternatives. Making it easier than ever before to navigate supermarket shelves and improve food choices. There's even a SaltSwitch filter to focus on products lower in salt.
- (App available at: <http://www.foodswitch.com.au>)

## Introduction

Cardiovascular disease (CVD) remains the leading cause of mortality, responsible for one third of all deaths worldwide [1]. In Australia, about one-third of the adult population has been diagnosed with high blood pressure, a main risk factor for CVD, contributing to 32% of total mortality [1, 2]. Sodium is the chemical element responsible for maintaining and regulating blood volume and pressure, in addition to other physiological functions. However, research has shown that over-consumption of sodium, most commonly in the form of sodium chloride, or salt, causes blood pressure to increase [2, 3]. Reducing salt intake is an effective way to lower blood pressure, and has become a priority for curbing the high burden of non-communicable diseases (NCDs) such as CVD. In 2006, the World Health Organization (WHO) set a global target of reducing population salt intake to below 5g/day [4]. In 2013, WHO Member States, including Australia, adopted a global target to reduce mean population salt intake by 30% by 2025 [5].

In Australia, the mean salt intake for adults is approximately 9g/day, nearly twice the WHO recommended target [2]. Nation-wide salt reduction efforts began with the creation of the Food and Health Dialogue (FHD) in 2009, succeeded by the Healthy Food Partnership (HFP) in 2016, identifying nine priority food categories for product reformulation and setting voluntary targets to reduce sodium content in the food supply [6]. In 2015, The Victorian Health Promotion Foundation (VicHealth) formed a partnership with the George Institute for Global Health and the Heart Foundation, creating a taskforce to inform, implement, and evaluate salt reduction initiatives throughout the country. The goal of the Partnership was to reduce population salt intake in Victoria by 1g/day by June 2018 through a combination of consumer and industry reformulation strategies [7].

Previous reports by the Partnership have been conducted to analyse sodium levels across food categories which are commonly consumed and considered high in salt [8]. Sauces and condiments, including Asian style sauces, are considered high sodium products. According to the Australian Health Survey 2011-2012, 40.1% of people surveyed consumed sauces, dips and condiments [9]. In addition, recent market research has indicated a 3% increase in retail value sales of sauces, dressings and condiments in Australia in 2017 [10]. Given the rising popularity of sauces, there is a need to evaluate the current sodium content of these products to inform consumers of the hidden salt in their food, and advise manufacturers on opportunities for reformulation.

As part of the VicHealth Salt Partnership, the aim of this project is to assess current mean sodium levels in Asian style sauces in main supermarkets in Australia, and to track changes in sodium content between 2010, 2013, 2015 and 2018. Although sodium targets for sauces have not been set in Australia, an analysis of compliance with targets set by AWASH (Australian Division of World Action on Salt and Health) was performed to determine how many products meet these targets [11, 12].

## Methods

### *Data Collection*

Food product data was collected in 2018 from four major supermarkets in Australia: Coles, Woolworths, SUPA IGA and Aldi, located in Sydney, NSW. Images of targeted products were

recorded, and only items with labelled product and nutrition information were included, including brand name, product name, manufacturer, package size, serving size, and sodium content (per serving, and per 100 g/100mL). The same products available in different pack sizes were recorded as separate entries. For a comparative analysis, product data for years 2010, 2013, and 2015 was extracted from the Australian FoodSwitch database.

#### *Data Categorization and product exclusion*

Three main categories of Asian style sauce products were analysed, including soy sauce, fish sauce, and oyster sauce. Products with missing or erroneous information, and duplicate items found in multiple stores, were excluded. All marinades and stir-fry sauces, hoisin sauces, flavoured and sweet soy sauces (including kecap manis), and dipping sauces (eg. Vietnamese spring roll dipping sauce) were excluded from analysis.

#### *Data Analysis*

The total number of products and products per category were recorded. The mean sodium content per 100mL food and range of sodium levels, were determined for all Asian style sauces and each category and presented in mg/100mL and grams of salt. Trends in mean sodium levels between 2010, 2013, 2015 and 2018 were determined. The proportion of products meeting the AWASH salt targets [12, 13] were determined for each category.

Statistical analyses were conducted in Stata 15 [14]. Alpha was set at a 0.05 significance level. One-way ANOVA (post-hoc Scheffe) were performed to compare mean sodium content across the years.

#### **Conclusions**

No significant change in the average sodium content of categorized Asian style sauces was observed between 2010-2018. However, the high salt content of these products is apparent, with only 31% of products meeting AWASH targets. The variability of sodium levels within sub-categories and across different brands of products, may mislead consumers' food choices, and requires greater transparency. However, these findings suggest that reformulation of high-sodium products is achievable. Specific, government established sodium targets for different categories of Asian style sauces can encourage the food industry to reformulate, assisting with national salt reduction efforts.

## Tables

Table 1. Average salt content (sodium mg/100mL; salt g) per subcategory of Asian style sauces, 2010-2018.

Year	2010			2013			2015			2018				
	N	Mean mg/100mL [salt g]	Range	N	Mean mg/100mL [salt g]	Range	N	Mean mg/100mL [salt g]	Range	N	Mean mg/100mL [salt g]	Range	% Change <sup>a</sup>	p- value <sup>a</sup>
Asian style sauces	17	5330 [13.3]	2951-8689	46	5487 [13.7]	2550-9115	43	5475 [13.7]	1803-8762	51	5859 [14.7]	1803-10882	9%	0.725
Fish sauce	2	6061 [15.2]	3434-8689	7	7004 [17.5]	4279-9115	6	6792 [16.9]	4279-7803	6	9637 [24.1]	7992-10882	55%	0.060
Oyster sauce	5	3505 [8.8]	2951-4377	11	3619 [9.1]	2550-4918	11	3508 [8.8]	1803-4443	14	3604 [9.0]	1803-4770	1%	0.985
Soy sauce	10	6097 [15.2]	3390-7619	28	5841 [14.6]	3390-8762	26	6004 [15.0]	3810-8762	31	6148 [15.4]	3808-8762	0%	0.849

<sup>a</sup> 2010 vs. 2018, p<0.05 is significant. ANOVA conducted. No significant results. Difference between 2010 and 2018 and corresponding p-value adjusted for multiple comparison

Table 2. Comparison of sodium content in Asian style sauces in 2018 against the AWASH salt target of 4840 mg/100g.

	N	N meeting target	Percentage meeting target (%)
Asian style sauces	51	16	39%
Fish sauce	6	0	0%
Oyster sauce	14	14	100%
Soy sauce	31	6	19%

Table 3. Serve size of Asian style sauces by weight or volume, as specified on product label (g or mL).

Serve Size			
Asian style sauces	N	Mean	Range
Fish sauce (mL)	6	16 mL	15-20 mL
Oyster sauce (g)	8	21 g	15-37.5 g
Oyster sauce (mL)	6	13 mL	10-15 mL
Soy sauce (mL)	31	14 mL	5-20 mL

**Table 4.** Top 5 Asian sauces with the highest salt content.

Product name	Manufacturer	Sodium (mg/100mL) [Salt g/100mL]	Sodium (mg/serve) [Salt g/serve]	Sodium mg per TB [salt g]	Serving size mL
Ayam Fish Sauce	A Clouet (Australia) Pty Ltd	10882 [27.2]	1632 [4.1]	2176 [5.4]	15
Asia Specialties Fish Sauce	Aldi	10500 [26.3]	1575 [3.9]	2100 [5.3]	15
Maggi Authentic Thai Fish Sauce	Nestle Australia Ltd	10170 [25.4]	2034 [5.1]	2034 [5.1]	20
Three Crabs Brand Fish Sauce	Viet Huong Fishsauce Company, Inc.	10126 [25.3]	1519 [3.8]	2025 [5.1]	15
Chang's Light Soy Sauce*	Cypress & Sons Pty Ltd	8762 <i>9200mg/100g</i> [21.9]	1752 <i>1840mg/serve</i> [4.4]	1752 [4.4]	20

\*Sodium content reported in mg/100g was converted to mg/100mL using an AUSNUT density conversion to maintain consistency in the comparative analysis. Original measures of sodium provided as indicated on label.

**Table 5.** Top 5 Asian sauces with the lowest salt content.

Product name	Manufacturer	Sodium mg per 100mL [salt g]	Sodium mg per serve [salt g]	Sodium mg per TB [salt g]	Serving size mL
Pandaroo Oyster Sauce	Yuen's Market Trading co.	1803 <i>2200 mg/100g</i> [4.5]	216 <i>330 mg/serve</i> [0.5]	361 [0.9]	12
Ong's Oyster Sauce	Oriental Merchant Pty Ltd	2550 <i>3111 mg/100g</i> [6.4]	383 560 mg/serve [1.0]	510 [1.3]	15
Coles Oyster Sauce	Coles	3030 [7.6]	455 [1.1]	606 [1.5]	15
Amoy Oyster Sauce	Amoy Food Ltd.	3057 <i>3730 mg/100g</i> [7.6]	948 <i>1400 mg/serve</i> [2.4]	611 [1.5]	31
Chang's Original Oyster Sauce	Cypress & Sons Pty Ltd	3279 [8.2]	394 [1.0]	656 [1.6]	12

\*Sodium content reported in mg/100g was converted to mg/100mL using an AUSNUT density conversion to maintain consistency in the comparative analysis. Original measures of sodium provided as indicated on label.

## References

1. Roth GA, Johnson C, Abajobir A, Abd-Allah F, Abera SF, Abyu G, et al. Global, regional, and national burden of cardiovascular diseases for 10 causes, 1990 to 2015. *Journal of the American College of Cardiology*. 2017;23715.
2. Land M-A, Neal BC, Johnson C, Nowson CA, Margerison C, Petersen KS. Salt consumption by Australian adults: a systematic review and meta-analysis. *The Medical Journal of Australia*. 2018;208(2):75-81.
3. 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.
4. World Health Organization. Prevention of cardiovascular disease: World Health Organization; 2007.
5. Mendis S. Global status report on noncommunicable diseases 2014: World health organization; 2014.
6. Government of Australia. Food and Health Dialogue Canberra, Australia: Commonwealth of Australia; 2015 [Available from: <http://www.health.gov.au/internet/main/publishing.nsf/Content/fhd>].
7. Victorian Health Promotion Foundation. Salt Reduction in Victoria Victoria, Australia: Commonwealth of Australia; 2015 [Available from: <https://www.vichealth.vic.gov.au/programs-and-projects/salt-reduction>].
8. Heart Foundation. Unpack the salt: Downloadable Resources: Heart Foundation; 2017 [Available from: <https://unpackthesalt.com.au/resources-category/?category=food>].
9. ABS. Australian Health Survey: Nutrition First Results-Foods and Nutrients, 2011-12. Canberra, Australia: The Australian Bureau of Statistics. 2014.
10. Euromonitor International. Sauces, Dressings and Condiments in Australia. 2017.
11. Trevena H, Neal B, Dunford E, Wu JH. 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*. 2014;6(9):3802-17.
12. Webster J. Interim Australian targets for sodium levels in 85 food categories. Sydney, Australia: The George Institute; 2011.
13. Public Health England. Salt Reduction Targets for 2017. London: Public Health England; 2017.
14. StataCorp. Stata Statistical Software: Release 15. College Station, TX: StataCorp LLC; 2017.