



## Salt levels in common processed foods in Hong Kong

April 2018

 The George Institute  
for Global Health



香港大學  
THE UNIVERSITY OF HONG KONG

Report prepared for The University of Hong Kong (HKU) and The George Institute for Global Health by Daisy Hannah Coyle Accredited Practising Dietitian (APD), PhD Candidate, The George Institute for Global Health.

### Introduction

Cardiovascular disease (CVD) is the leading cause of death worldwide.<sup>1</sup> It is responsible for approximately 17.5 million deaths per year, which represents 46% of deaths from noncommunicable diseases (NCDs).<sup>2</sup> Excess salt intake is a major contributor to high blood pressure, the leading risk factor for disease burden worldwide.<sup>3</sup> Globally, it has been estimated that excess sodium intake, more than 2g/day, contributes to 1.65 million cardiovascular-related deaths each year.<sup>4</sup> According to the Thematic Household Survey conducted by the Hong Kong Census and Statistics Department, 13.7% of the Hong Kong population had hypertension in 2016/17.<sup>5</sup>

There is considerable evidence for the efficacy of reducing sodium intake to reduce blood pressure.<sup>6,7</sup> In 2013, all World Health Organisation (WHO) Member States agreed to work towards the global target of a 30% relative reduction in mean population salt intake with the aim of achieving a target of less than 5 grams per day per person (approximately 2g sodium) by 2025.<sup>8</sup>

There is limited recent evidence reporting population-wide salt intakes in Hong Kong. In 2014, the average salt intake for post-menopausal women in Hong Kong, estimated from urinary excretion, was 7.8 grams/day<sup>9</sup>; 1.5 times the WHO recommendation of 5 grams per day. The average salt intake for men is estimated to be higher.

The aim of this report was to analyse food labels to determine the sodium content of popular processed foods in Hong Kong and to compare the variability in sodium content within products from the same food categories. A secondary aim was to compare sodium contents against daily salt targets set by the WHO.

### Methods:

#### Data Collection

Sodium data was extracted from the George Institute's FoodSwitch database for Hong Kong. Data was collected from grocery retail stores in Hong Kong, using the protocol for data collection for the FoodSwitch database<sup>10</sup>. 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, sodium content per 100g and per serve were recorded. Serving size was determined according to their recommended serve size reported on the nutrition information panel. Data was reviewed and cleaned to remove duplicate products, products in which sodium content (mg/100g) was not available, multipacks and products with suspected inputting errors.

#### Categorisation

The FoodSwitch Hong Kong database included 12,871 foods across 16 food groups, which were classified into 61 categories. For the purpose of this report, we focused on categories that contained processed foods which; (a) are commonly found in Hong Kong supermarkets; (b) typically contain a high amount of added sodium; and (c) are required to display a nutrition information panel. Based on this criteria, we selected and analysed four categories, which included 2109 foods: sauces, noodles, processed meat and processed fish.

The remaining 10,762 products were excluded from the analysis and fell broadly into the following food groups: breads and bakery products; confectionary; dairy; edible oils; eggs; fruits and vegetables; snack foods; special foods; sugars and honey; vitamins and supplements and non-alcoholic beverages.

Sauces were categories into 10 sub-categories: Asian sauces, gravies and stocks, meal-based sauces, table sauces, mustard, marinades, pasta sauces, tomato pasta,

meat accompaniments and other sauces. Noodles were categorised into two sub-categories: Flavoured noodles and plain noodles. Processed meat was categorised into 13 sub-categories: Salami and cured meat, dried meat, sliced meat, bacon, whole ham and similar product, canned meat, sausages and hotdogs, pate and meat spread, roast chicken, raw flavoured meat, other meat product, meat burger, frozen and chilled meat. Processed meat was categorised into four sub-categories: chilled fish, canned fish, frozen fish and other fish product.

### Data analysis

The data was analysed using sodium per 100g of product 'as sold'. Products displaying nutrition information for 'as prepared' only were excluded from the analyses. To convert to salt (g) multiply sodium (mg) by 2.5 and divide by 1000. For example: 2000mg sodium = 5g salt.

The number of products, median and range of sodium content (mg/100g) was calculated for each food category. Compared with the mean, median values are less sensitive to skewed data and extreme values. Due to both the large range in sodium content within each food category and the presence of outliers, the median was selected as the most appropriate measure of central tendency. Line graphs depicting both the median and range was used to examine the variation that exists between individual food products from the same food category.

To understand how much different products could contribute to daily sodium intake, we calculated the medium and maximum amount of sodium obtained per serve. This was calculated by multiplying the median and maximum sodium values observed in each product category by the typical serve size for that category. The median and maximum sodium values obtained per serve were then converted to salt (g), divided by 5g/day (WHO daily salt target) and multiplied by 100, to assess what percentage of the daily salt target is obtained from one typical serve. The modal value (the most frequent occurring number) for serving size was calculated in each food category and this determined the typical serve size

## Results

### Median and range of values in all food categories

**Table 1 Sodium content of common processed foods in Hong Kong (N = 2023)**

| Food category   | No. of products | Sodium mg/100g |           |
|-----------------|-----------------|----------------|-----------|
|                 |                 | Median         | Range     |
| Sauces          | 720             | 1980           | 0 – 23900 |
| Noodles         | 555             | 1380           | 0 – 7930  |
| Processed meats | 426             | 804            | 5 – 3920  |
| Processed fish  | 322             | 612            | 8 – 6400  |

- Sodium data for 2023 products was included
- These products were summarised into four categories: Sauces, noodles, processed meats and processed fish.
- The number of products in each category ranged from 322 – 720.

- Food categories with the highest median sodium content were sauces (1980mg/100g), noodles (1380mg/100g), processed meat (804mg/100g) and processed fish (612mg/100g).

### Median and range of values in comparison to WHO salt consumption targets

**Table 2 Comparison of sodium content to WHO daily salt target (<5g per day)**

| Food category   | No. of products | Typical serve size | Median salt value per serve (g) | % of WHO target | Maximum salt value per serve (g) | % of WHO target |
|-----------------|-----------------|--------------------|---------------------------------|-----------------|----------------------------------|-----------------|
| Sauces          | 737             | 5g                 | 0.3                             | 6%              | 3                                | 60%             |
| Noodles         | 555             | 100g               | 3.5                             | 70%             | 20                               | 400%            |
| Processed meats | 426             | 50g                | 1                               | 20%             | 5                                | 100%            |
| Processed fish  | 322             | 100g               | 1.5                             | 30%             | 16                               | 320%            |

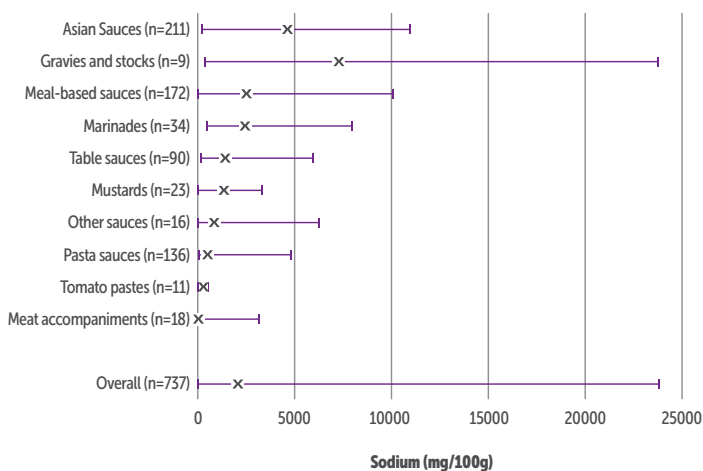
- Noodles contained the highest salt value per typical serve. Based on the median salt content, a typical serve on noodles would meet 70% of the WHO daily salt intake target according to the median salt value. This is based on a typical serve of 100g, however, it is likely that people may exceed this serving size especially if they consume more than one noodle packet at a time, or if they consume noodles more than once per day.
- For each food category, the maximum amount of salt per typical serve was also calculated.
  - o For processed meats, a typical 50g serve (about 2 slices of ham, half a sausage, 10 thin slices of salami) of the saltiest processed meat met 100% of the WHO salt target.
  - o For noodles, a typical 100g serve of the saltiest noodles contains 20g of salt; that is 400% of the WHO salt target in one serve.
  - o The saltiest sauce contained 3g of salt per typical serve of 5g; that is 60% of the WHO salt target.
  - o For processed fish, a 100g serve of the saltiest fish contained 16g of salt; that is 320% of the WHO salt target.

## Sauces

**Table 3 Sodium content of sauce products on available in Hong Kong**

| Sauce type          | No. of products | Sodium mg/100g |             |
|---------------------|-----------------|----------------|-------------|
|                     |                 | Median         | Range       |
| Overall             | 720             | 1980           | 0 – 23900   |
| Asian sauces        | 211             | 4634           | 157 – 11001 |
| Gravies and stocks  | 9               | 7275           | 327 – 23900 |
| Meal-based sauces   | 172             | 2513           | 8 – 10108   |
| Marinades           | 34              | 2405           | 420 – 7987  |
| Table sauces        | 90              | 1400           | 150 – 5968  |
| Mustards            | 23              | 1333           | 9 – 3360    |
| Other sauces        | 16              | 840            | 1 – 6290    |
| Pasta sauces        | 136             | 500            | 14 – 4841   |
| Tomato pastes       | 11              | 200            | 47 -550     |
| Meat accompaniments | 18              | 0              | 0 – 3200    |

- Of all the food categories, sauces contained the highest median sodium content and also had the greatest range in sodium content.
- Gravies and stocks had the highest median sodium content (7275mg/100g) and was followed by Asian



sauces including soy sauce, oyster sauce and fish sauce (4634mg/100g) and meal-based sauces (2513mg/100g).

- Meat accompaniments including apple sauce and cranberry sauce contained the lowest amount of sodium (0mg/100g), followed by tomato pastes (200mg/100g) and pasta sauces (500mg/100g).
- The median sodium content in a typical serving of Asian sauces (5g) contained 232mg of sodium (0.6g of salt) – that is over 10% the WHO daily salt intake target (<5g) in just one small serve.

**Figure 1 Variation in sodium content (median and range, mg/100g) for sauces available for purchase in Hong Kong.**

- There was a huge range in the sodium content of sauce products.
- Gravy and stock had the largest range in sodium content (327 – 23900mg/100g), followed by Asian sauces (157 – 11001mg/100g) and meal-based sauces (8 – 10108mg/100g).
- The large range in sodium content for these food

categories is mainly due to differences in sodium between powdered and liquid products. Powdered products such as stocks, gravies and meal-based sauces are sold in their concentrated form and require preparation before they can be consumed. For this reason, they are often higher in sodium per 100g than prepared, ready-to-use liquid varieties.

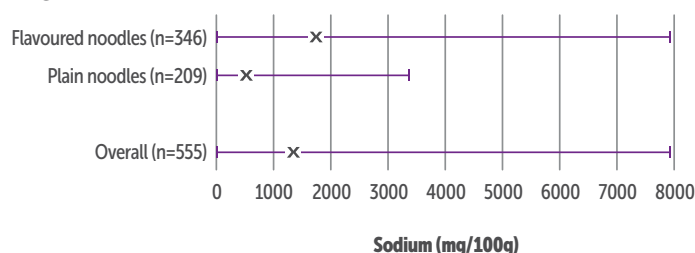
## Noodles

**Table 4 Sodium content of noodle products on available in Hong Kong**

| Noodle type       | No. of products | Sodium mg/100g |          |
|-------------------|-----------------|----------------|----------|
|                   |                 | Median         | Range    |
| Overall           | 555             | 1380           | 0 – 7930 |
| Flavoured noodles | 345             | 1764           | 0 – 7930 |
| Plain noodles     | 209             | 529            | 0 - 3400 |

- Noodles were the second largest category analysed and had the second highest median sodium content (1380mg/100g).
- Flavoured noodles had the highest median sodium content (1764mg/100g) with a range of 0 – 7930mg sodium.
- Based on the average recommended serving size (100g) and the median sodium content (1764mg/100g) – just one serving of flavoured noodles could contain 1764mg of sodium (4.4g of salt). That is just under the WHO daily salt target of <5g/day!
- Plain noodles contained less than one third of the sodium content of the flavoured varieties. However, the median sodium content per 100g was still 561mg, which is approximately 30% of the WHO daily salt target.
- The five products highest in sodium per 100g within this food category were all flavoured noodles. All noodles were different flavours.

**Figure 2 Comparison of sodium content (mg/100g) and sodium variation (mg/100g) between noodles available for purchase in Hong Kong.**



- There was a large variation in sodium content in the noodle category (0 – 7930mg/100g), especially for the flavoured noodles (0 – 7930mg/100g).
- Switching from the saltiest plain noodle to the least salty would save 3400mg of sodium.
- Switching from the saltiest flavoured noodle to the least salty would save 7930mg of sodium.
- Swapping from the saltiest flavoured noodle to the saltiest plain noodle would save 4530mg of sodium.

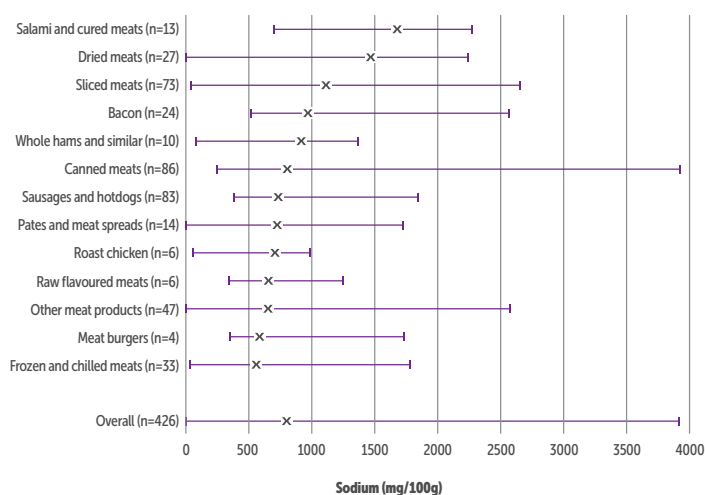
## Processed meat

**Table 5 Sodium content of processed meat products on available in Hong Kong**

| Processed meat type             | No. of products | Sodium mg/100g |            |
|---------------------------------|-----------------|----------------|------------|
|                                 |                 | Median         | Range      |
| Overall                         | 426             | 804            | 5 - 3920   |
| Salami and cured meats          | 13              | 1680           | 696 - 2280 |
| Dried meats                     | 27              | 1470           | 10 - 2244  |
| Sliced meats                    | 73              | 1111           | 39 - 2600  |
| Bacon                           | 24              | 974            | 517 - 2571 |
| Whole hams and similar products | 10              | 918            | 81 - 1370  |
| Canned meats                    | 86              | 800            | 260 - 3920 |
| Sausages and hotdogs            | 83              | 737            | 395 - 1840 |
| Pates and meat spreads          | 14              | 732            | 5 - 1725   |
| Roast chicken                   | 6               | 712            | 58 - 984   |
| Raw flavoured meats             | 6               | 664            | 344 - 1250 |
| Other meat products             | 47              | 654            | 16 - 2571  |
| Meat burgers                    | 4               | 586            | 354 - 1737 |
| Frozen and chilled meat         | 33              | 551            | 37 - 1786  |

- Processed meat was the third largest food category with 426 products, however, it contained the largest number of sub-categories.
- The median sodium content for all processed meats was 804mg/100g.
- Salami and cured meats had the highest median sodium content (1680mg/100g) and this was followed by dried meats (1470mg/100g) and sliced meats (1111mg/100g).
- The median sodium content for a standard 50g serve of salami and cured meat was 840mg.
- Frozen and chilled meat (e.g. chicken drumsticks and chicken wings) contained the lowest amount of sodium (511mg/100g) followed by meat burgers (586mg/100g) and other meat products (e.g. beef patties and meat balls (654mg/100g).

**Figure 3 Comparison of sodium content (mg/100g) and sodium variation (mg/100g) between processed meat available for purchase in Hong Kong.**



- Some salami and cured meats contained over three times as much sodium than others (696 – 2280mg/100g).

- The products with the greatest range in sodium were canned meats (260 – 3920mg/100g), other meat products (16 – 3974mg/100g) and sliced meats (39 – 2600mg/100g).
- By switching to a lower salt canned meat, you could save up to 3360mg of sodium per 100g.

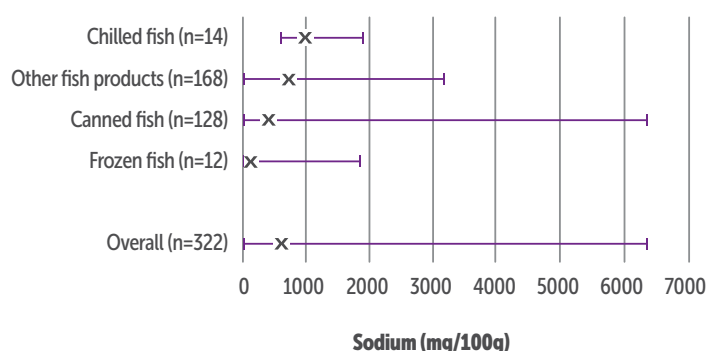
## Processed fish

**Table 6 Sodium content of processed fish products on available in Hong Kong**

| Processed fish type | No. of products | Sodium mg/100g |            |
|---------------------|-----------------|----------------|------------|
|                     |                 | Median         | Range      |
| Overall             | 322             | 612            | 8 - 6400   |
| Chilled fish        | 14              | 1000           | 600 - 1900 |
| Other fish products | 168             | 712            | 8 - 3202   |
| Canned fish         | 128             | 410            | 50 - 6400  |
| Frozen fish         | 12              | 79             | 19 - 1860  |

- Overall, processed fish contained 611.5mg of sodium per 100g.
- Chilled fish had the highest sodium content (1000mg/100g), followed by other fish products (712mg/100g) which included fish balls, imitation crab sticks and fish sausage, and canned fish (410mg/100g).
- Smoked salmon products made up over 70% of the total products in the chilled fish sub-category. Smoked salmon is cured in salt prior to cooking and therefore it is not surprising that this sub-category contained the highest sodium content.

**Figure 4 Comparison of sodium content (mg/100g) and sodium variation (mg/100g) between processed fish available for purchase in Hong Kong.**



- The products with the greatest range in sodium content were canned fish (50 – 6400mg/100g), followed by other fish products (8 – 3202mg/100g), and frozen fish (19 – 1860mg/100g).
- The wide range in sodium content amongst the canned fish products is likely due to a number of factors including the type of fish (anchovies, tuna, sardines, oysters), the type of fluid (water, brine, oil, flavoured oil) as well as the amount of salt added during processing.
- This large range in sodium content highlights that switching up the type of canned fish a person buys at the grocery store can help reduce their salt intake.
- The wide range in sodium content within the other

fish product category is likely due to the variability in products within the category, which ranged from fish cakes, fish balls and fish sausages to imitation fish such as abalone, scallop and crab.

### **Conclusion:**

There is a wide range in sodium content both between and within food categories available for purchase in Hong Kong. Overall, the median sodium content in the foods analysed was high, with a typical single serve size meeting 20-69% of the WHO salt target. It is very likely that an individual would exceed the WHO daily salt target by consuming a combination of these foods across the day. The variation in sodium content amongst comparable products highlights the potential for reformulation by food manufacturers to reduce the sodium content of these products. In addition, it suggests that simple swaps during a grocery shop could have a major impact on an individual's sodium intake.

### **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.

### **The George Institute for Global Health**

The George Institute for Global Health is improving the lives of millions of people worldwide through innovative health research. Working across a broad health landscape, the Institute conducts clinical, population and health system research aimed at changing health practice and policy worldwide. The Institute has a global network of medical and health experts working together to address the leading causes of death and disability worldwide. Established in Australia and affiliated with UNSW Sydney, the Institute today also has offices in China, India and the United Kingdom, and is also affiliated with Peking University Health Science Centre, the University of Hyderabad and the University of Oxford.

The George Institute prioritises clinical and population health research that produces outcomes that are easily translated into practice, and effect real change within a short period of time to health policy and practice. The Institute has been ranked among the top 10 global institutes for impact for the last several years, and its

research has resulted in changes to medical guidelines and ways of thinking about some of the most common medical treatments around the world. Examples include developing a new treatment for stroke, showing that blood pressure lowering reduces the risk of cardiovascular disease in people with diabetes, and providing safer fluid options for patients in intensive care. Developing better methods for delivering health care are a priority for the Institute. Follow us on Facebook at and on Twitter @georgeinstitute

### **Media Enquiries**

Julia Timms  
Senior Media Advisor  
The George Institute for Global Health  
P: + 61 410 411 983  
E: [jtimms@georgeinstitute.org.au](mailto:jtimms@georgeinstitute.org.au)

### **References**

1. World Health Organization. The Global Burden of Disease: 2004 Update; [http://www.who.int/healthinfo/global\\_burden\\_disease/GBD\\_report\\_2004update\\_full.pdf](http://www.who.int/healthinfo/global_burden_disease/GBD_report_2004update_full.pdf). Accessed 18 February 2018.
2. World Health Organization. Global Status Report on noncommunicable diseases 2014; [http://apps.who.int/iris/bitstream/10665/148114/1/9789241564854\\_eng.pdf?ua=1](http://apps.who.int/iris/bitstream/10665/148114/1/9789241564854_eng.pdf?ua=1). Accessed 16 February 2018.
3. Lim SS, Vos T, Flaxman AD, et al. A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010. Dec 15 2012; 380(9859):2224-2260.
4. Mozaffarian D, Fahimi S, Singh GM, et al. Global sodium consumption and death from cardiovascular causes. The New England Journal of Medicine. Aug 14 2014;371(7):624-634.
5. Census and Statistics Department Hong Kong. Thematic Household Survey Report No. 63. Dec 2017. <https://www.statistics.gov.hk/pub/B11302632017XXXXB0100.pdf>. Accessed 19 February 2018.
6. He FJ, Li J, Macgregor GA. Effect of longer term modest salt reduction on blood pressure: Cochrane systematic review and meta-analysis of randomised trials. April 3 2013; 346:1-15. BMJ.
7. Aburto NJ, Ziolkovska A, Hooper L, et al. Effect of lower sodium intake on health: systematic review and meta-analyses. April 3 2013: 1-20
8. World Health Organization. Global action plan for the prevention and control of noncommunicable disease 2013-2020. 2013; [http://apps.who.int/iris/bitstream/10665/94384/1/9789241506236\\_eng.pdf?ua=1](http://apps.who.int/iris/bitstream/10665/94384/1/9789241506236_eng.pdf?ua=1). Accessed 18 February 2018.
9. Centre for Food Safety. The First Hong Kong Total Diet Study Report No. 9 - The First Hong Kong Total Diet Study: Minerals. Dec 2014. [http://www.cfs.gov.hk/english/programme/programme\\_firm/files/Report\\_on\\_the\\_1st\\_HK\\_Total\\_Diet\\_Study\\_Minerals\\_e.pdf](http://www.cfs.gov.hk/english/programme/programme_firm/files/Report_on_the_1st_HK_Total_Diet_Study_Minerals_e.pdf). Accessed 18 February 2018.
10. Dunford E, Webster J, Metzler AB, et al. International collaborative project to compare and monitor the nutritional composition of processed foods. Dec 2012; 19(6):1326 - 1332.