

**Risk Assessment Studies**

**Report No. 49**

**Study on Sodium Content in Local Foods**

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Centre for Food Safety

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## **Risk Assessment Studies**

### **Report No. 49**

#### **Study on Sodium Content in Local Foods**

## **Executive Summary**

The Centre for Food Safety (CFS) has conducted a study to assess the sodium content in some local foods (both non-prepackaged and prepackaged), aiming to raise the awareness of the public and food traders on related issues. The foods were chosen either because sodium reduction targets have already been set for them by overseas health authorities or because they were found to have a relatively high sodium content from the literature. It is believed that sodium content of these foods can potentially be lowered by the trade.

The findings can provide some baseline data on the current situation of sodium content in a variety of foods likely high in sodium, and provide a benchmark for the trade to adopt when reformulating foods in different food categories to a lower sodium content version.

Sodium is essential for normal body functions; however, excessive intake can be detrimental to health, such as increasing the risk of developing hypertension and other related non-communicable diseases. The World Health Organization recommends limiting daily sodium intake to 2,000mg, i.e. 5g of salt to reduce the risk of coronary heart diseases and strokes.

### **The Study**

Between January and April 2012, non-prepackaged and prepackaged food samples among selected food groups were collected from local retail food markets, restaurants and supermarkets. Lower salt/sodium counterparts were also sampled if available. A total of 632

non-prepackaged items and 314 prepackaged items were analysed for their levels of sodium.

For non-prepackaged foods, laboratory analysis for sodium was conducted by the Food Research Laboratory of the CFS. All food samples (edible portions) were analysed individually as purchased. For prepackaged foods, information on nutrition label was used for data analysis.

## **Results**

### *Non-prepackaged food*

The sodium content of food items among non-prepackaged foods varied greatly from no detection to 17,000mg/100g. The food group with the highest average sodium content was “Processed vegetable products” (5,784mg/100g). For the two food groups of “Asian foods and dim sum” (e.g. ‘siu mai’) and “Western fast food” (e.g. ‘burgers’), even for the same food item, a great variation in the average sodium content was also observed.

### *Prepackaged food*

Excluding salt, the sodium content of prepackaged food groups varied from 12 to 16,807mg/100g. On average, the group with the highest sodium content was “Condiments and sauces (salt excluded)” (3,585mg/100g).

### *Feasibility of sodium reduction in foods with high sodium content*

Rinsing salted vegetables (e.g. ‘Dong Choy’) in water gave a

maximum sodium reduction of 37% and soaking them in water gave a maximum sodium reduction of 66%. Rinsing some salty appetisers (e.g. seasoned kelp) in a glass of water (250 ml) can lower the sodium content to a maximum of 28%.

To avoid excessive intake of sodium which in turn affects consumers' health, food traders may consider providing more food items with lower sodium content for customers to choose from, and serve food with no added salt/seasonings or with seasonings provided separately at the point of sales. Furthermore, they may prioritise to reformulate certain non-prepackaged foods (e.g. "Burgers", "Western preserved sausages") using overseas sodium reduction targets as reference for corresponding or similar foods. They may also use these targets to reformulate or as a guide to import some prepackaged foods (e.g. "Canned baked beans", "Ketchup", "Salad dressing").

### **Conclusion and Recommendations**

The sodium content of many food items, particularly burgers, Western preserved meats, and condiments and sauces, was rather high. Based on some overseas sodium reduction targets, there should be significant room for reduction of the sodium content of these foods. The study results showed that within the same food category, there is a wide range of sodium levels, which indicates that reformulation with less salt is feasible for many foods. Lastly, rinsing or soaking could reduce the sodium content of salted vegetables.

### *Advice to consumers*

1. Read nutrition labels and choose foods that contain lower sodium content.
2. Change the dietary habit to minimise adding salt or sodium-containing seasonings to food, e.g. consider removing the salt shakers or sodium-containing seasonings from the dining table so as to allow the taste buds to gradually adapt to light flavour of foods.
3. Consume less preserved salted vegetables or salty appetisers.
4. Rinse and/or soak preserved salted vegetables in water before using them in recipes or before consumption to cut down on sodium intake.

### *Advice to the trade*

1. Develop affordable quality food products with low sodium content.
2. Use the local data collected in the study and the overseas sodium reduction targets as reference when reformulating foods with lower sodium content.
3. Establish a database of the company products so as to monitor the sodium content of foods, and use portable salt metres to gauge the amount of salt in non-prepackaged food products such as soups, condiments and sauces.
4. Rinse or soak salted vegetables in water to reduce some sodium content before using them in food preparation.



## **Study on Sodium Content in Local Foods**

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### **OBJECTIVE**

This study aims to assess the sodium content in some local foods (both non-prepackaged and prepackaged). The results can provide (i) some baseline data on the current situation of sodium content in a variety of foods that are likely to be high in sodium, and (ii) a benchmark for the trade to adopt when reformulating those foods in different food categories to a lower sodium content version.

### **BACKGROUND**

2. Sodium is essential for normal body functions; however, excessive intake can be detrimental to health such as increasing the risk of developing hypertension (i.e. high blood pressure) and other related non-communicable diseases (NCDs).<sup>1</sup> Besides hypertension, in recent years, expert reports from the World Cancer Research Fund concluded that salt and salt-preserved foods probably increase the risk of stomach cancer.<sup>2</sup> In May 2012, the WHO published the latest health statistics of 193 Member States which show that 13% of global deaths are attributed to hypertension, and it has been estimated that hypertension causes 51% of stroke deaths and 45% of coronary heart disease (CHD) deaths.<sup>3</sup> Based on overseas experiences, the sodium content in some foods (e.g. soy sauce, instant noodles, take-away foods) can be reduced by adding

less salt- or sodium-containing ingredients, or by replacing them with alternatives.<sup>4</sup>

3. In 2011, the Centre for Food Safety (CFS) established a working group to develop a set of Trade Guidelines on Reducing Sodium in Foods (the Guidelines). In consultation with the trade, the Guidelines provide recommendations to help the trade minimise the use of sodium (or salt) in foods. This initiative is included as one of the actions in the Action Plan of the Working Group on Diet and Physical Activity as part of the Department of Health's strategic framework for prevention and control of NCDs.<sup>5</sup>

4. The WHO has suggested two ways to obtain sodium content of foods, direct and indirect sources. The direct sources include national and regional food composition databases, modified databases from another country, and direct food analysis. The indirect sources include industry-provided data, food label review, food company or restaurant websites, and research data from the literature.<sup>1</sup>

5. Collecting information on the sodium level in a wide range of foods has been done in overseas. For example, the Food Standards Australia New Zealand (FSANZ) conducted an analytical survey with laboratory analysis of sodium content of 363 packaged and take-away foods.<sup>6</sup> The Centre for Science in the Public Interest in Ottawa has analysed the sodium level of 264 packaged foods and 50 restaurant foods based on the information provided on the food labels or on the restaurants' corporate websites.<sup>7</sup> Similarly, the New York City

Department of Health and Mental Hygiene has analysed the sodium content of lunchtime fast food purchases at major US chains using information posted on company websites.<sup>8</sup> This helps the governments to understand their situation for sodium reduction policy making.

6. In Hong Kong, with one of the aims as to encourage food manufacturers to apply sound nutrition principles in the formulation of foods, the Nutrition Labelling Scheme implemented since July 2010 requires all prepackaged foods to declare the sodium content on a nutrition label. Nutrition claims, such as “low sodium/salt”, “very low sodium/salt” and “sodium/salt free” claims, are permitted if the prescribed conditions are met.<sup>9</sup>

7. There are a few reports about the sodium content in local foods. For example, in 2009, the Consumer Council (CC) and CFS has jointly reported the sodium content of savoury snacks in Hong Kong.<sup>10</sup> However, the study only focused on savoury snacks. In addition, there are some nutrition related risk assesement studies which have measured the sodium content in local foods without further discussing on it (e.g. Trans Fatty Acids in Local Foods (III), Nutrient Contents of Common Non-prepackaged Beverages in Hong Kong).<sup>11,12</sup> The sodium content of these foods has been compiled into the web-based database -- Nutrition Information Inquiry System (NIIS). However, systematic surveys on the sodium level in local foods are lacking.

## **Dietary Sources of Sodium**

8. The terms salt and sodium are often used synonymously, but on a weight basis, salt comprises 40% sodium and 60% chloride (1g of sodium chloride (NaCl) contains about 393mg of sodium). However, some salt products available in the local market may have replaced NaCl partially with other ingredients, such as potassium chloride (KCl) (may be used as a flavour enhancer). In general, salt products labelled as 'reduced sodium salt' have sodium content at least 25% lower than the regular counterparts, according to Nutrition Labelling Scheme.

9. Sodium is naturally present in plant and animal foods as well as drinking water. However, the major dietary source of sodium is from condiments and sauces, such as salt, soy sauce, and oyster sauce. Sodium may also present in the diet as food additives, e.g. sodium nitrate (a preservative) and monosodium glutamate (MSG) (a flavour enhancer) in processed foods.<sup>4</sup>

10. The major sources of sodium intake of a population are affected by the dietary pattern, which for the local population is probably a mixture of Eastern and Western diets. According to the WHO, in the Western diets, salt in processed foods is the major source (about 75%) of the sodium intake. In Asian countries, salt added during cooking and at table is an important source of sodium intake. In the traditional Chinese diet, over 70% of salt is added while cooking, with the remainder accounted for through the use of soy sauce and salted vegetables.<sup>13</sup> In April 2012, some newspaper headlines quoted a local university's report

that Hong Kong people have a daily consumption of 10g salt, which exceeds WHO's recommendation of a salt intake of less than 5g per day (i.e. less than about 2,000mg of sodium).<sup>13</sup>

### **Physiological Functions of Sodium**

11. Sodium is essential for normal body functions. It helps maintain the extra-cellular fluid balance and acid-base balance in the body. It is required for nerve transmission and muscle contraction.<sup>14</sup>

12. Kidneys are responsible for regulating the amount of sodium in the body. They conserve sodium when the levels are low. On the other hand, they excrete the excess amount in urine when the levels of sodium are high. When the kidneys cannot excrete enough sodium and it results in sodium and fluid retention, this may lead to hypertension and increase the risk of CHD and strokes. Some people are more sensitive to sodium; they tend to retain sodium more easily and may have higher risk of developing hypertension.<sup>14</sup>

### **Salt/Sodium Intake Safety Reference Values**

13. According to the WHO, there is a dose response and a direct relationship between salt intake and blood pressure; and there is additional benefit if salt is reduced even if the diet is already a "healthy" one. It is estimated that decreasing dietary intake from 10g to 5g per day would reduce overall stroke rate by 23% and cardiovascular disease rate by 17%. Currently there is no consensual definition of foods with high sodium content although some countries (e.g. in the United Kingdom

(UK)) may classify a food as high in sodium if every 100g of such food contains more than 600mg of sodium;<sup>15</sup> however, in any case, it is targeted for the consumers to meet WHO's recommendation of less than 2,000mg sodium per day.<sup>13</sup>

## **Sodium in Foods**

14. Salt has multifunctional roles in food processing. Salt is added in foods for its taste and flavour (e.g. enhance sweetness, mask metallic tastes). Salt can also prevent microbial growth, extend product shelf life, and improve the product texture (e.g. control the stickiness of doughs, improve the tenderness of leaner cuts of meat).<sup>4</sup>

## **International and Local Situations on Monitoring Sodium Content**

15. Food safety requires proactive tripartite collaboration among the government, food trade and consumers. The WHO has suggested some strategies for the Member States to focus on when planning and implementing interventions aiming at reducing population-wide sodium intake. These include public awareness campaigns, regulation, food labelling, benchmarking of food categories, food reformulation, and many others.<sup>13</sup>

16. In July 2012, the WHO has developed a set of indicators and voluntary global targets for the prevention and control of non-communicable diseases. A target of 30% relative reduction from 2010 to 2025 in mean population intake of salt, with the aim of achieving a target of <5g/day has been proposed. The WHO opines that this target is

to be achieved by implementation of salt reduction interventions such as reduced salt content in processed foods through product reformulation.<sup>16</sup>

17. Taking food safety, quality and consumer acceptance into consideration, food reformulation is the widely adopted approach to reduce the sodium intake in foods.<sup>17</sup> Three initiatives have been identified to reduce the sodium content in foods to the lowest level possible over time: (i) to reduce or remove the amount of salt/ sodium to the minimum little by little, (ii) to replace the salt/ sodium uses with alternatives, and (iii) to resize the package of products.

18. It is well recognised that the process of setting targets for sodium content in foods is complex since the role and function of salt vary depending on the nature of the food. Nevertheless, many places (e.g. the UK, Canada, New York City) have established targets in various food categories and encouraged the trade to achieve such targets in the coming few years. A gradual reduction can allow the human taste buds to get adapted to the new taste. In the Australian Sodium in Bread study, an incremental sodium reduction by 25% in bread over a six-week period was not detected by the hospital patients being served. Canada, the United States (US), the UK, and Australia have been advocating a gradual reduction by setting national sodium reduction targets for different food types.<sup>4,17,18,19,20</sup>

19. The CFS has drafted a set of Guidelines to be issued together with this report. The Guidelines aim to encourage the trade to develop healthier foods with lower sodium content via three main approaches: (i)

to source for ingredients or develop more creative formulations that contain less sodium without altering food quality; (ii) to replace salt/sodium with alternatives, such as herbs and spices; and (iii) to resize product package so as to reduce the amount of sodium consumed each time.

## **SCOPE OF STUDY**

20. This study covered foods which have sodium reduction targets set by overseas health authorities and/or foods found to have relatively high sodium content from the literature. They were in 9 food groups (i) Condiments and sauces; (ii) Processed meat products; (iii) Processed vegetable products; (iv) Snacks; (v) Bakery products; (vi) Soup (ready-to-eat and condensed); (vii) Western fast foods; (viii) Asian foods and dim sum; and (ix) Other foods (including “ready-to-eat vegetarian snacks” and “cold dishes/appetisers” in non-prepackaged foods and “breakfast cereals” in prepackaged foods).

## **METHODS**

### **Sampling**

21. Between January and April 2012, food samples of commonly consumed foods were collected from the local retail food markets, restaurants, and supermarkets. A total of 632 non-prepackaged items and 314 prepackaged items were collected. **Table 1** shows the number of food categories and food items among the nine food groups sampled. The list of food items covered in each category is shown in **Annex I** for



non-prepackaged foods and **Annex II** for prepackaged foods.

**Table 1. The number of food categories and items among the nine food groups sampled in the study**

Food group	No. of non-prepackaged food category (item)	No. of prepackaged food category (item)
Condiments and sauces	5 (30)	10 (62)
Processed meat products	11 (80)	6 (40)
Processed vegetable products	3 (29)	3 (15)
Snacks	7 (81)	8 (66)
Bakery products	8 (80)	4 (36)
Soup (ready-to-eat and condensed)	4 (60)	3 (25)
Western fast foods	6 (67) <sup>†</sup>	4 (23)
Asian foods and dim sum	13 (185) <sup>†</sup>	4 (35)
Other foods	2 (20)	2 (12)
<b>Total</b>	59 (632) <sup>†</sup>	44 (314)

<sup>†</sup> The total number for non-prepackaged food items includes 624 individual items and 8 averaged items (each made up of 8-12 samples, i.e. a total of 77 samples) from 2 food groups.

22. Some of these food groups are included in the study because there are sodium reduction targets set by overseas health authorities (i.e. “Bakery products”, “Preserved meat products”, “Snacks”, “Western fast foods”). Others are local foods found to have relatively high sodium content in the literature including some previous CFS studies (i.e. “Condiments and sauces”, “Processed vegetable products”, “Soup (ready-to-eat and condensed)”, and “Asian foods and dim sum”). Food groups with a larger variety of food items had more quotas for food sampling.

23. For this study, non-prepackaged food items are usually ready-to-eat or take-away foods (e.g. ‘French fries’) which do not have

nutrition labels. Contrarily, prepackaged food items are products with valid nutrition labels unless exempted (e.g. under the Small Volume Exemption (SVE) Scheme). They may be ready-to-eat (e.g. ‘Potato chips’) or require further preparation/ processing by the consumers (e.g. ‘Chilled dim sum’). In some non-prepackaged (e.g. ‘Fried potatoes’) and prepackaged (e.g. ‘Soy sauce’) food categories, where available, plain/ no salt added or low/reduced salt/sodium products were also included.

24. In order to obtain a wide range of relatively high sodium food samples in each food category, generally speaking, each category comprises 3-17 food items of different varieties. Furthermore, to facilitate the demonstration of the feasibility to reduce sodium/ salt in the same food item, selected food items in 2 categories of the “Western fast foods” group and 6 categories of the “Asian foods & dim sum” group were studied in detail, i.e. each food item was sampled from around 8-12 premises (see **Annex I**). These food items are selected because in the same category, they are relatively common and/or they have relatively higher sodium content as observed from data in available food composition databases.

## **Laboratory Analysis and Data Collection**

### *Non-prepackaged food*

25. CFS’s officers assisted in sampling, weighing, and taking digital photographs of the products. Food samples were purchased from various premises, including supermarkets, dry good stores, fresh provision shops, and other eateries in different locations of Hong Kong Island, Kowloon

and the New Territories. Within the same food category, food premises were selected by applying the following criteria as far as possible: (i) avoid sampling at different outlets belonging to the same retail chain; and (ii) avoid sampling more than one-third of the quota from one outlet (not applicable to food items with plain/no salt added versions and the 8 selected food items).

26. Laboratory analysis of sodium content in non-prepackaged foods was conducted by the Food Research Laboratory (FRL) which is experienced in analysing nutrients in foods. Food sample was weighed and only the edible portions were analysed individually for sodium content, after homogenisation and acid digestion, using inductively coupled plasma-optical emission spectrometry (ICP-OES).

#### *Prepackaged food*

27. Within the same food category, samples were purchased from various supermarkets or convenience stores by applying the following criteria as far as possible: (i) avoid sampling different packages (e.g. 200g vs 300g) belonging to the same brand of product; and (ii) avoid taking more than one sample from the same brand (not applicable to food items with plain/no salt added or low/reduced salt/sodium versions). No laboratory testing was conducted for these foods.

#### **Data Analysis**

28. The sodium content in foods was reported as mg/100g of edible portion. The mean and range of each food category, separately for

non-prepackaged foods and prepackaged foods, were reported as per 100g for solid and liquid foods. In addition, the mean in each food category was compared with the sodium reduction targets set by overseas authorities, where appropriate.

#### *Non-prepackaged food*

29. FRL analysed the sodium content in individual sample as purchased. Values below limit of detection (LOD) (0.4mg/100g) are reported as “Not Detected” (ND) and between LOD and limit of quantitation (LOQ) (1.0mg/100g) are reported as “Trace”. When calculating an arithmetic mean concentration of sodium in the same type of food, 0mg/100g was applied to samples with ND and “Trace” sodium content.

30. In addition, the mean and range of sodium content are also presented for the 8 selected foods from the “Western fast foods” group and the “Asian foods and dim sum” group.

#### *Prepackaged food*

31. The sodium content on the label was used for data analysis. Any nutrition claims related to sodium or salt were also recorded.

## **RESULTS AND DISCUSSIONS**

### **Sodium Content in Non-prepackaged Food**

32. A total of 632 non-prepackaged food items (including 624 individual items and 8 selected items made up of 8-12 samples) in 59

food categories under 9 food groups were tested. The sodium level in the analysed foods varied among food groups as well as within the same food group.

#### *Sodium content among the nine food groups*

33. The results for the 9 groups are summarised in **Table 2** and the details are in **Annex I**. The group with the highest in sodium was “Processed vegetable products” (5,784mg/100g). Consistent with the data from available food composition databases, processed vegetable products/salted vegetables may contain sodium as high as a few thousand mg/100g.

**Table 2. Sodium content in nine non-prepackaged food groups**

Food Group	n	Sodium (mg/100g)			
		Avg	Std Dev	Min	Max
Condiments and sauces	30	1,183	1,137	310	4,600
Processed meat products	80	1,225	1,250	280	6,800
Processed vegetable products	29	5,784	4,397	380	17,000
Snacks*	81	935	1,630	0	9,800
Bakery products	80	315	176	1	660
Soup (ready-to-eat and condensed)	60	343	132	160	810
Western fast foods*§	67	488	167	130	850
Asian foods and dim sum*§	185	361	142	3	900
Other foods	20	715	359	300	1,400
<b>Total</b>		<b>632†</b>			

**Note:** n = number of items assessed

\* Indicates item(s) with no salt added or with sauce served separately has been included, if possible from the same shop, e.g. French fries, nuts, and steamed rice roll.

§ Indicates the mean of 8-12 samples from various shops included. “Western fast foods” -- Meat sauce spaghetti; Hamburger. “Asian foods and dim sum” -- Fried rice with diced chicken and salted fish; Steamed rice with satay beef; Fried noodles with preserved vegetable and spare rib; Shrimp dumpling “Ha gau”; “Siu mai” (Shrimp/ Beef); and Pan-fried turnip cake.

† The total number includes 624 individual items and 8 selected items (each made up of 8-12 samples, i.e. a total of 77 samples) from 2 food groups.

### *Sodium content within the eight selected food items*

34. The average sodium content of the 8 selected food items ranged from 269mg/100g in ‘steamed rice with satay beef’ to 598mg/100g in ‘siu mai’ (see **Table 3**). Overall, their sodium contents varied greatly within the same food items. These are examples of manufacturer differences, where the level of sodium in a product is determined by the trade’s prescribed formulation. As a daily monitoring, traders may use some portable salt metres to gauge the amount of salt in non-prepackaged food products such as soups, condiments and sauces.

**Table 3. Sodium content in the eight selected non-prepackaged food items**

Food Item	n	Sodium (mg/100g)			
		Avg	Std Dev	Min	Max
Asian foods and dim sum					
Fried rice with diced chicken and salted fish	12	401	58	280	520
Steamed rice with satay beef	10	269	67	150	400
Fried noodles with preserved vegetable and spare rib	10	519	131	370	770
Siu mai	9	598	138	330	800
"Pan-fried turnip cake"***	10	415	55	320	520
"Ha gau"	10	473	96	340	650
Western fast foods					
Hamburger	8	445	128	340	720
Meat sauce spaghetti	8	310	76	200	400
Total	77				

**Note:** n = number of samples assessed

\*\*\* Indicates that some sample(s) may have sauce served separately and the sauce was not analysed.

### **Sodium Content in Prepackaged Food**

35. The nutrition information on food label of a total of 314

prepackaged food items in 44 food categories under 9 food groups were recorded. The sodium level in the recorded foods varied among food groups as well as within the same food group. **Table 4** shows the average sodium content in the 9 food groups (**Annex II** shows the details in the categories).

#### *Sodium content among the nine food groups*

36. Excluding salt, the sodium content of prepackaged food groups varied from 12 to 16,807mg/100g. On average, the group with the highest sodium content was “Condiments and sauces (salt excluded)” (3,585 mg/100g).

**Table 4. Sodium content in nine prepackaged food groups**

Food Group	n	Sodium (mg/100g)			
		Avg	Std Dev	Min	Max
<b>Condiments and sauces (salt excluded)*</b>	53	3,585	3,859	275	16,807
<i>Salt</i>	4	32,365	12,385	13,800	39,000
<i>Seasoned salt</i>	5	30,207	5,926	21,400	37,900
<b>Processed meat products*</b>	40	1,078	1,085	61	6,800
<b>Processed vegetable products</b>	15	2,177	2,626	500	10,100
<b>Snacks†</b>	66	1,120	1,254	167	8,121
<b>Bakery products</b>	36	399	234	52	1,211
<b>Soup (ready-to-eat and condensed)†*</b>	25	2,183	3,278	58	10,110
<b>Western fast foods*</b>	23	483	227	164	1,230
<b>Asian foods and dim sum</b>	35	1,228	956	187	3,616
<b>Other foods</b>	12	295	198	12	623
<b>Total</b>		314			

**Note:** n = number of items assessed

\* Indicates products with nutrient content claims and/ or nutrient comparative claims on salt/sodium included.

† Indicates same products with different series of varied sodium content; or sodium-containing sauces/seasonings can be added by consumers.

## **Reducing Sodium Contents of Processed Vegetables as Ingredients Commonly Used in Chinese or Asian Dishes**

37. Certain “preserved vegetables products” or salted vegetables commonly consumed in Chinese dishes (e.g. Mui Choy, Dong Choy) and some Asian foods (e.g. kimchi, seasoned kelp) were found to contain very high sodium, ranging from about 1,000 to 8,500mg/100g as purchased in this study (see **Annex II**). Studies have shown that treatment involving draining, rinsing, and/or soaking of various canned and packaged vegetables (e.g. corns, beans) results in about 40% sodium reduction.<sup>4</sup> Currently such data is lacking on “preserved vegetables products” or salted vegetables commonly used in Chinese or Asian dishes. Hence, small scale experiments were conducted in FRL to provide some insights on the percentage of sodium reduced after rinsing and/or soaking them in drinking water.

### *Salted vegetables as ingredients*

38. A total of 7 types of “preserved vegetables products” were chosen because they were frequently used in local dishes. According to the common practice of rinsing/soaking them for different durations before being used in the recipes, the percentage of sodium reduction was assessed. The range of sodium reduction in 3 samples of the 7 vegetable products after treatment is shown in **Table 5**.



**Table 5. Sodium content reduction of seven salted vegetables after rinsing or soaking in water**

Salted vegetables	n	Sodium content before treatment (by calculation) (mg/100g)	Range of sodium reduction after treatment (%)		
			10 seconds rinsing	5 minutes soaking	30 minutes soaking
Preserved Sichuan mustard	3	4,900 – 6,500	2.1 – 4.4	1.5 – 5.6	13 – 19
Preserved leaf mustard	3	2,000 – 2,600	3.5 – 21	9.1 – 14	21 – 29
Preserved cabbage/"Dong Choy"	3	6,500 – 7,700	26 – 37	17 – 30	57 – 62
Preserved "turnip"	3	6,500 – 7,000	5.3 – 6.6	24 – 27	54 – 63
Salted preserved mustard	3	7,800 – 8,700	10 – 25	31 – 39	48 – 55
Sweet preserved mustard	3	6,200 – 8,200	9.6 – 17	34 – 45	56 – 66
Preserved mustard greens	3	3,600 – 4,200	14 – 17	21 – 24	29 – 49

**Note:** n = number of samples assessed

39. Depending on the types of “preserved vegetables products” tested, the results showed that about 2.1-37% of sodium will be reduced after 10 seconds of rinsing under running water. On the other hand, 1.5-66% of sodium will be reduced after 5 to 30 minutes of soaking the vegetables in the water, and the longer the time, the greater the reduction in general. The variation in sodium loss is affected by many factors, such as the presence of salt on the vegetable, the surface area of the vegetable, etc. The results implied that when preparing common local dishes with “preserved vegetables products” as one of the ingredients (e.g. ‘Steamed ground beef with Dong Choy’, ‘Noodles with preserved Sichuan mustard and shredded pork’), traders or consumers could rinse or soak the salted ingredients in water and remove the water before use.

#### *Other dishes or salty appetisers*

40. Two salty Asian appetisers (i.e. kimchi, seasoned kelp) were chosen because of their popularity in Asian eateries. According to some

dining out practices of soaking them for different durations before consumption, the percentage of sodium reduction was assessed. The range of sodium reduction after treatment is shown in **Table 6**.

**Table 6. Sodium content reduction of two salty appetisers after rinsing in water**

Salty appetisers	n	Sodium content before treatment (mg/100g)	Range of sodium reduction after treatment (%)	
			rinsing + draining (total 5 seconds)	rinsing + draining (total 10 seconds)
Kimchi	3	680 – 870	12 – 28	22 – 25
Seasoned kelp	3	640 – 730	16 – 23	25 – 27

**Note:** n = number of samples assessed

41. Depending on the duration and types of salty appetisers tested, the results showed that about 12-28% of sodium will be reduced after 5-10 seconds of rinsing in a glass of water (about 250ml), with the longer the time, the greater the reduction in general.

### **Discretionary Salt or Sodium-containing Sauces/seasonings Added in Foods**

#### *Non-prepackaged food*

42. One of the suggestions in the Guidelines is to encourage the trade to serve the foods with no salt or sodium-containing sauces/seasonings added at the point of sale. In this study, some of the samples and their counterparts without sauces were collected and analysed. It was found that the sodium content in these foods can be reduced greatly, e.g. French fries with and without added salt (200 vs 55mg/100g, a medium portion is about 100g) and roasted macadamia nuts with and without added salt (120 vs 1.2mg/100g).

### *Prepackaged food*

43. Another advice in the Guidelines is to encourage the trade to provide more low sodium versions of foods for the consumers. Some examples found in this study are those items with nutrient comparative claim or of different flavours (e.g. a lightly salted crisps product has sodium 250mg/100g but its ordinary counterpart has 500mg/100g). Furthermore, a brand of canned cream of mushroom soup was found to have three versions with different sodium content (i.e. 342, 542 and 691mg/100g).

44. Encouraging the trade to provide seasonings separately is one of the recommendations in the Guidelines. For instance, it is noted that a dim sum and an extruded snack provided the seasonings separately and the sodium content of the seasonings *per se* was stated in the nutrition label. This allows the consumers to make individual choices of adding some or none of it according to their taste. In the dim sum, 135g of the product contains 694mg sodium, whereas the small pack of 5g of seasonings included already contains 192mg sodium. In the extruded snack, 1 serving of the food (about 43g) contains 260mg sodium; however, if the seasoning (about 2g) is added, the total amount of sodium in the food will double to about 410mg. These are examples of discretionary use of salt or sodium-containing seasonings which can make a big difference to an individual's sodium intake level.

## Comparison of Sodium Content with Various References

### *UK's criteria of “high” and “low” sodium content in foods*

45. The UK National Health Service has classified a food as high in sodium if its level is at  $>600\text{mg}/100\text{g}$  and a food as low in sodium if its level is at  $\leq 300\text{mg}/100\text{g}$ .<sup>15</sup> Using these criteria, among the 632 non-prepackaged items and the 314 prepackaged items, about 28% (i.e. 180 items) and 57% (i.e. 178 items), respectively would be classified under the high group; whereas about 27% (i.e. 169 items) and 15% (i.e. 46 items) respectively would be classified under the low group. This contrasting result implied that it is possible for the trade to provide healthier counterparts with a lower sodium content even for some foods commonly considered to be high in sodium (e.g. “Snacks”, “Asian foods and dim sum”).

### *Overseas' sodium reduction targets*

46. Some health authorities in Canada, New York City, and the UK have been advocating a gradual reduction by setting national sodium reduction targets for different food types.<sup>17-20</sup> **Annex III** depicts the comparison of the mean (and maximum) sodium content of some foods assessed in this study with the available sodium reduction targets set by these authorities for corresponding or similar foods. The results showed that many food products, particularly burgers, Western preserved sausages, and condiments and sauces, have high sodium content which still have room for improvement as compared with the overseas sodium reduction targets.

47. Salt/Sodium has multifunctional roles in food processing, such as for taste and flavour, and for preventing microbial growth.<sup>4</sup> Taking food safety, quality and consumer acceptance into consideration, the trade of the above products is encouraged to start monitoring their sodium content as a priority of sodium reduction, especially when salt/sodium is added for taste *per se*. Furthermore, they may use these targets to reformulate or as a guide to import some prepackaged foods with lower sodium content.

### **Limitations of the Study**

48. Dietary sodium intake of the local population cannot be estimated from this study. Foods such as oils and fats, dairy products, fresh fruits and vegetables, beverages and sugary/confectionery products were excluded because their sodium contents are generally low. Furthermore, only limited food samples were collected in each food category which may not reflect the actual situation of sodium content in foods. Some seasonal foods may not have enough samples due to their low availability and them being exempted for carrying a nutrition label under SVE Scheme.

49. Direct chemical analysis of prepackaged foods was not conducted in this study. Nevertheless, under the Nutrition Labelling Scheme, companies should have already conducted their own quality-control programmes to ensure the accuracy of the information on the nutrition label. Furthermore, some products suspected violating the Nutrition Labelling Scheme requirements were referred to the

enforcement unit for follow up and their information was not used in the study.

## **CONCLUSION AND RECOMMENDATIONS**

50. The sodium content of many food items, particularly burgers, Western preserved meats, and condiments and sauces, was rather high. Based on some overseas sodium reduction targets, there should be significant room for reduction of the sodium content of these foods. The study results showed that within the same food category, there is a wide range of sodium levels, which indicates that reformulation with less salt is feasible for many foods. Lastly, rinsing or soaking could reduce the sodium content of salted vegetables.

### **Advice to consumers**

51. The public is advised to:

- (a) Read nutrition labels and choose foods that contain lower sodium content.
- (b) Change the dietary habit to minimise adding salt or sodium-containing seasonings to food, e.g. consider removing the salt shakers or sodium-containing seasonings from the dining table so as to allow the taste buds to gradually adapt to light flavour of foods.
- (c) Consume less preserved salted vegetables or salty appetisers.
- (d) Rinse and/or soak preserved salted vegetables in water before

using them in recipes or before consumption to cut down on sodium intake.

### **Advice to the trade**

52. Members of the trade are advised to:

- (a) Develop affordable quality food products with low sodium content.
- (b) Use the local data collected in the study and the overseas sodium reduction targets as reference when reformulating foods with lower sodium content.
- (c) Establish a database of the company products so as to monitor the sodium content of foods, and use portable salt metres to gauge the amount of salt in non-prepackaged food products such as soups, condiments and sauces.
- (d) Rinse or soak salted vegetables in water to reduce some sodium content before using them in food preparation.

Annex I: Sodium content in non-prepackaged foods by category

Food category	(Food items included)	n	Sodium (mg/100g)		
			Avg	Std Dev	Max
<b>Condiments and sauces</b>		30	1,183	1,137	310 4,600
<i>Sauce for Siu mei/Lomei meat</i>	(Charsiew/ Siu mei/ Lomei sauce; Ginger puree/ Ginger and shallot puree)	6	2,885	1,495	310 4,600
<i>Curry gravy</i>	(Indian; Japanese; Thai)(Solid included)	6	635	135	390 790
<i>White gravy</i>	(including mushroom; corn; etc.)(Solid included)	6	485	75	410 580
<i>Asian sauces</i>	(Vietnamese sweet and sour sauce; Sauce for nuggets)	6	1,300	597	400 2,100
<i>Gravy for other meat</i>	(Black pepper; Onion; Brown)	6	612	229	380 880
<b>Processed meat products</b>		80	1,225	1,250	280 6,800
<i>Siu mei/ Lomei chicken</i>	(Soy sauce chicken meat)	7	570	262	320 970
<i>Siu mei/ Lomei duck/ goose</i>	("Lo shui" duck/goose; Roasted duck/goose)	9	738	347	360 1,400
<i>Other siu mei/ lomei poultry</i>	("Lo shui" pigeon; Roasted pigeon)	7	669	301	280 1,000
<i>Siu mei/ Lomei pork</i>	(Roasted pork/ Roasted suckling pig; "Barbeque" pork)	9	691	193	350 970
<i>Other siu mei/ lomei pork product</i>	(Salted and smoked pork; "Lo Shui" pork meat (ear; trotter; tongue))	7	1,199	475	590 1,800
<i>Asian preserved sausages</i>	(Canton-style pork sausage/ Liver sausage; Red pork sausage)	5	1,754	775	870 2,700
<i>Western preserved sausages</i>	(Meat; Cheese; Cervelat; Pork; Chicken)	4	933	70	840 1,000
<i>Ready-to-eat marinated offal</i>	(Ox offals; Chicken liver)	4	585	283	330 990
<i>Ready-to-eat meat balls</i>	(Fish ball (fried/boiled); Beef/ Beef tendon ball; Meat stuffed ball; Cuttle fish ball; Shrimp ball)	10	744	205	420 980
<i>Preserved fish and seafood</i>	(Salted fish; Dried scallops; Dried shrimps)	9	4,089	1,776	1,700 6,800
<i>Preserved/ marinated egg</i>	(Tea leaf/Marinated chicken egg; Salted duck egg; Lime preserved egg)	9	1,002	478	430 1,900
<b>Processed vegetable products</b>		29	5,784	4,397	380 17,000
<i>Preserved leafy vegetables</i>	(Preserved leaf mustard; Preserved mustard greens; Preserved mustard/ "Mui Choy"; Preserved cabbage/ "Dong Choy")	14	8,529	3,682	3,100 17,000
<i>Preserved non-leafy vegetables</i>	(Preserved rakkyo/ ginger; Preserved "turnip" (preserved mustard); Preserved Sichuan mustard)	9	4,683	3,758	380 11,000
<i>Asian preserved vegetables</i>	(Kimchi; Japanese radish)	6	1,033	252	630 1,300
<b>Snacks</b>		81	935	1,630	0 9,800
<i>Fried potatoes</i>	(French fries*; Hash browns; Potato wedge)	13	370	269	20 690
<i>Popcorns</i>	(Flavours: Butter; Chocolate; Plain; Caramel)	8	164	272	0 730
<i>Salted nuts/ seeds</i>	(Cashew; Almond; Peanut; Pistachio nut; Sunflower seeds*; Pine seeds*; Macadamia nuts*)	13	266	419	0 1,500



# Annex I

Food category	(Food items included)	n	Sodium (mg/100g)		
			Avg	Std Dev	Max
<i>Preserved fruits</i>	(Lemon; Pummelo; Plum; Prunes; Citrus peel)	8	4,280	3,632	940
<i>Dried/Preserved meat snacks</i>	(Beef jerky; Dried pork jerky/ floss; Fried chicken nuggets; Chicken wing; Sausages; Mixed offals snack; Fried pig intestines; Fried fish skin)	13	847	380	390
<i>Preserved seafood snacks</i>	(Squid floss; Baked squid, Satay/Curry cuttlefish/Octopus; Baked fish; Dried scallop snack; Curry snail)	11	1,321	671	470
<i>Other savoury snacks</i>	(Curry fish balls; Imitated sharkfin soup; Stinky tofu; Fried "3 treasures"; Fish siu mai; Egg waffle)	15	423	198	150
<b>Bakery products</b>		80	315	176	1
<i>Plain breads/ cakes</i>	(White bread; Wholemeal bread; Piggy bun); (Chiffon cake; Pound cake)	12	350	180	56
<i>Stuffed/ Pizza breads containing meat</i>	(Sausage bun; Tuna fish bun; Ham and egg; Cheese and ham; Meat floss)	13	462	136	260
<i>Stuffed breads without meat</i>	(Garlic bread; Cocktail bun; "Pineapple" bun; Cream-filled bun with shredded coconut)	11	244	93	110
<i>Tart/ Pie</i>	(Egg/ Portuguese tart; Coconut tart; Chicken/ Beef pie; Apple/ Taro pie)	11	236	112	48
<i>Chinese bakeries</i>	(Almond biscuit; Walnut cookies; Crispy shell; Fried rice cake; "Kong So" biscuit; Peanut cookies; Preserved egg cake; Wife cake)	12	93	80	1
<i>Puff pastries</i>	(Curry puff; Samosa; Croissant)	9	447	101	270
<i>Fried dough products</i>	(Fried fritters; Doughnut)	5	420	221	230
<i>Western cookies</i>	(Cookies)	7	356	112	180
<b>Soup (ready-to-eat and condensed)</b>		60	343	132	160
<i>Chinese "long-hour" soups</i>	(Dried vegetables soup; Carrot maize pork soup; Chayote melon and pork soup; etc.)	15	225	53	160
<i>Chinese "short-hour" soups</i>	(Beaten egg soup; Pig stomach pepper soup; Fish maw soup)	15	379	94	300
<i>Western soup/ bisque</i>	(Borscht; Oxtail soup; Vegetables soup; Mushroom cream soup; Fish chowder; Cream soup with puff pastry; Pumpkin soup)	15	335	56	230
<i>Other soups</i>	(Tom yam soup with seafoods; Soup for Hainanese chicken rice; Hot and sour soup; Miso soup)	15	433	183	210
<b>Western fast foods</b>		67	488	167	130
<i>Spaghetti</i>	(including Lasagne; Marcroni; Ravioli; etc.) (with various ingredients/sauce: Meat sauce; Cheese; Meat ball; Squid ink; Vegetarian; Seafood, etc.)	15	336	99	150
<i>Burgers</i>	(with various ingredients: Hamburger; Fish; Chicken; Beef; Egg; Cheese; Vegetarian)	16	528	164	230
<i>Hotdog</i>	(with sausage)	6	610	182	420

# Annex I

Food category	(Food items included)	n	Sodium (mg/100g)		
			Avg	Std Dev	Min Max
Pizza	(with various ingredients: Cheese; Meat; Sausage; Seafood; Vegetarian; Hawaiian)	10	594	94	400 790
Sandwiches	(with various ingredients: Egg mayonnaise; Ham; Cheese; Tuna; Beef; Chicken)	10	539	156	350 760
Other fastfoods	(Quiches; Burrito/Taco/Wrap)	10	423	148	130 630
<b>Asian foods and dim sum</b>		185	361	142	3 900
Rice dishes - Fried	(Fried rice with diced chicken and salted fish§; Shredded beef/chicken and lettuce; Pork and tomato sauce; Fujian style; Egg white and dried scallop; Stir-fried tomato and sliced beef; Glutinous rice)	15	322	105	160 480
Rice dishes - Steamed rice with dishes	(Steamed rice with satay beef§; Stir-fried vegetable and sliced beef; Stir-fried egg and shrimp; Stewed beef brisket and radish; Beancurd sheet and roasted pork; Diced pork and sweet corn; Stir-fried tomato and sliced beef; Curry beef brisket, etc.)	15	206	76	110 340
Congee with various ingredients	(Preserved egg and pork; Dried fish, peanut and pork; Pig giblets; Boat; Fish slice; Pig's blood; Beef; Lettuce and dace ball; Pig's liver)	12	283	59	210 420
Fried noodle dishes	(including flat noodles; instant noodles; vermicelli; udon) (Noodles with preserved vegetable and spare rib§; Flat noodles with sliced beef and assorted vegetable; Noodles with preserved black bean; assorted pepper and spare rib/ beef; Noodles with bitter melon and beef; Flat noodles with assorted meat; Vermicelli (Xiamen/ Singapore style); etc.)	14	412	112	240 650
Plain/Stir noodles with fish/meat products in soup	(Fishball wheat noodles; Beef brisket flat rice noodles; Satay beef with instant noodles; Spicy pork with instant noodles)	15	426	123	200 620
Plain/Stir noodles with dumplings and soup	(Yu pei gau thick wheat noodles; Shui gau thin wheat noodles; Pork and vegetable "Yau Mian"; Vegetables dumpling Shanghai noodles; Wonton flat noodles/ "Ho Fan")	15	385	120	230 650
Other soup noodles	(Preserved vegetables rice vermicelli; Preserved mustard green and pork rice vermicelli; Beef ramen; Vietnamese meat noodles; etc.)	14	387	106	170 630
Dim sum - Rice rolls/ Other rolls	(Plain; Vegetables; Beef; Dried shrimp; Shrimp; Fritters; Barbecue pork; Shredded chicken and vegetables in roll)**	17	242	140	3 530
Dim sum - Dumplings	(Shrimp dumpling 'Ha gau'§; Coriander; Pea shoots; Chiuchow style; Vegetarian; Shanghai style steamed pork)**	14	416	80	270 560
Dim sum - Wrapped rice	(Shanghai sticky rice roll; Glutinous rice wrapped in lotus leaf; Meat; Lyle water)	10	309	143	15 530

# Annex I

Food category	(Food items included)	n	Sodium (mg/100g)		
			Avg	Std Dev	Max
<i>Dim sum - Steamed bun/ roll</i>	(Roll stuffed with roasted pork; Bun with vegetable; Big bun; Bun stuffed with pork and vegetables; Chicken bun; Barbecue pork bun; Glutinous rice steam bun/ roll)	15	367	75	540
<i>Dim sum - Other steamed dishes</i>	("Siu mai"; Minced beef ball; Spareribs; Chicken feet with bean sauce; Fish head; Dace/ fish ball; Ox tripe; Beef omasum; Cuttle fish with bean sauce; Beancurd sheet roll with chicken; Beancurd sheet roll with duck web, etc.)**	13	556	145	900
<i>Dim sum - Fried/Pan fried and baked</i>	("Pan-fried turnip cake"; Spring roll; Dace/ fish ball; Seafood roll; Vegetarian spring roll; Wanton; Spring onion cake; Taro cake; Pork dumpling; Meat dumpling; Taro dumpling; Turnip pastry; Lime preserved egg pastry; etc.)**	16	399	158	690
<b>Other foods</b>		20	715	359	1,400
<i>Ready-to-eat vegetarian snacks</i>	(Mock fish; Mock beef; Mock poultry; Mock chawsiew)	10	567	173	900
<i>Cold dishes/Appetisers</i>	(Japanese marinated octopus; Salted peanuts; Marinated chicken claw; Marinated jellyfish/ sea blubber; Seasoned kelp)	10	863	440	1,400
		<b>Total</b>	<b>632†</b>		

**Note:** n = number of items assessed

\* Indicates plain/ no salt added version has been included from the same shop, if available.

\*\* Indicates sauces provided separately have not been analysed.

§ Indicates the mean of 8-12 samples from various shops included. Western fast foods -- Meat sauce spaghetti; Hamburger. Asian foods and dim sum -- Fried rice with diced chicken and salted fish; Steamed rice with satay beef; Fried noodles with preserved vegetable and spare rib; Shrimp dumpling "Ha gau"; "Siu mai" (Shrimp/ Beef); and Pan-fried turnip cake.

† The total number includes 624 individual items and 8 averaged items (each made up of 8-12 samples, i.e. a total of 77 samples) from 2 food groups.

Annex II: Sodium content in prepackaged foods by category

Food category	(Food items included)	n	Sodium (mg/100g)		
			Avg	Std Dev	Max
<b>Condiments and sauces**†</b>		62	7,589	10,893	275
<i>Salt**†</i>	(Fine salt; Sea salt; Iodised salt; Reduced sodium salt)	4	32,365	12,385	13,800
<i>Seasoned salt</i>	(Pepper; Garlic; Onion)	5	30,207	5,926	21,400
<i>Soy sauce*</i>	(Light; Dark; Reduced sodium)	5	6,017	1,782	3,120
<i>MSG and Stock powder/ cube</i>	(Chicken; Clam; Vegetable)	5	13,381	1,997	11,700
<i>Salad dressing</i>	(Thousand island; Mayonnaise; Vinigarette)	5	828	292	500
<i>Oyster sauce</i>	(Traditional; Vegetarian)	5	3,978	907	2,800
<i>Tomato paste / Ketchup</i>	(Ketchup)	5	1,208	106	1,058
<i>Other Western sauces</i>	(Chilli paste/ sauce; White sauce; BBQ sauce; Pasta sauce; Turkey gravy; Brown sauce; Pizza sauce, etc.)	9	548	277	275
<i>Other Chinese sauces</i>	(Black bean paste; Chilli broad bean paste / chilli bean paste "Toban sauce"; "Chu-hou" paste; Sour plum sauce; XO sauce; "Hoi-sin" sauce; Fermented bean curd, etc.)	10	2,730	1,396	840
<i>Other Asian sauces</i>	(Thai curry sauce; Fish sauce; Teriyaki sauce; Garlic chilli sauce; Sambal belancha; Roast meat sauce; Korean soybean sauce; Vegetarian sauce, etc.)	9	3,415	2,666	830
<b>Processed meat products*</b>		40	1,078	1,085	61
<i>Asian preserved sausages</i>	(Canton-style pork sausage/ Duck liver sausage; Preserved duck thigh)	6	1,670	708	848
<i>Western preserved sausages</i>	(Meat; Cheese; Pork; Chicken)	6	775	163	565
<i>Canned fish*</i>	(Sardine; Tuna; Dace; Salmon; Anchovy in Olive oil, Brine, Chilli, Black bean sauce, Tomato sauce, Water)	10	622	640	61
<i>Canned meat*</i>	(Corned beef; Luncheon meat; Sausage)	5	845	153	696
<i>Chilled/ Frozen meat balls</i>	(Fish ball (fried/boiled); Beef tendon ball; Meat stuffed ball; Cuttle fish ball; Shrimp ball)	8	782	281	410
<i>Western preserved meat</i>	(Bacon; Ham)	5	2,353	2,507	929
<b>Processed vegetable products</b>		15	2,177	2,626	500
<i>Preserved leafy vegetables</i>	(Cabbage/ "Dong Choy"; Mustard/ "Mui Choy"; Mustard greens)	5	4,112	4,016	500
<i>Preserved non-leafy vegetables</i>	(Preserved Sichuan mustard; Pickled cucumber; Pickled olives;	7	1,169	772	500

## Annex II

Food category	(Food items included)	n	Sodium (mg/100g)		
			Avg	Std Dev	Min Max
	Chilli radish; Asparagus)				
<i>Asian preserved vegetables</i>	(Kimchi; Japanese radish; Chilli bamboo shoot)	3	1,306	402	880 1,680
<b>Snacks†</b>		66	1,120	1,254	167 8,121
<i>Potato chips†</i>	(Original; Lightly salted; BBQ; Other flavours)	11	438	158	172 741
<i>Crisps or extruded snacks†</i>	(Prawn crackers; Corn chips/ Tortilla chips; Cheese flavoured ring/ball; Rice cracker; Fish ball crackers, etc.)	13	832	464	193 1,800
<i>Noodle snacks</i>	(Noodle snack)	4	1,257	611	708 2,112
<i>Salted nuts/ seeds</i>	(Cashew; Almond; Hazelnut; Peanut; Pistachio nut; Pumpkin seeds; Sunflower seeds; Watermelon seeds; Macadamia nuts, etc. )	12	747	1,147	167 4,367
<i>Preserved fruits</i>	(Lemon; Raisins; Orange peel; Plum)	6	3,036	2,998	239 8,121
<i>Preserved meat snacks</i>	(Dried pork/beef jerky/ floss; Egg)	6	1,280	491	819 2,000
<i>Preserved seafood snacks</i>	(Roasted squid floss; Satay fish; Dried/ Roasted fish; Fish sausage)	8	1,660	585	851 2,664
<i>Other snacks</i>	(Seaweed snacks; Dried beancurd; Dried mock roast duck; Green peas; Tapioca chips)	6	855	689	318 2,185
<b>Bakery products</b>		36	399	234	52 1,211
<i>Plain breads/ cakes</i>	(White/Wholemeal sandwich bread; Cheese flavour bread; Chiffon cake; Pound cake)	8	367	209	91 782
<i>Chinese New Year food</i>	(Sesame cookies; Sesame seed and peanut puff pastry; Crispy egg floss)	3	496	625	52 1,211
<i>Western cookies</i>	(Choco chips; Nuts; Butter; Palmiers biscuits; Shortbread; Waffle; Wafers)	12	292	107	130 530
<i>Crackers/ Biscuits</i>	(Saltine; Soda/Cracker)	13	496	184	171 900
<b>Soup (ready-to-eat and condensed)*†</b>		25	2,183	3,278	58 10,110
<i>Soup base for hot pot and Broth*†</i>	(Chicken; Clear; Miso; Fish; Pork; Tom Yam)	9	4,788	4,373	58 10,110
<i>Chinese "long-hour" soups</i>	(Papaya, peanut and chicken feet soup; Spare rib and dried yam soup; Mushroom and conch soup; Pork lung and almond soup)	4	183	29	140 200
<i>Western soup and bisque*†</i>	(Pumpkin soup; Tomato soup; Vegetables soup; Mushroom cream soup; Clam chowder; French onion; Corn cream soup; Reduced sodium version)	12	896	850	200 2,400
<b>Western fast foods*</b>		23	483	227	164 1,230
<i>Frozen pies/ rolls</i>	(Cheese broccoli pot pie; Chicken pie; Scallop puff; Spinach puff)	5	411	94	296 500

## Annex II

Food category	(Food items included)	n	Sodium (mg/100g)		
			Avg	Std Dev	Max
<i>Frozen spaghetti</i>	(Lasagne; Macaroni; Ravioli; Spaghetti with Vegetables, Chicken, Clam)	8	489	318	209 1,230
<i>Frozen pizza</i>	(Cheese; Tuna; Seafood; Vegetarian, etc.)	6	554	104	437 700
<i>Canned baked beans*</i>	(Baked beans in tomato sauce; Reduced sodium version)	4	455	304	164 860
<b>Asian foods and dim sum†</b>		35	1,228	956	187 3,616
<i>Instant noodles pack (with seasonings)†</i>	(Noodles; Rice noodles; Vermicelli; Udon (with any seasonings))	8	2,021	1,020	939 3,616
<i>Instant noodles bowl (with seasonings)†</i>	(Noodles; Rice noodles; Vermicelli; Udon (with any seasonings))	9	1,956	716	928 3,279
<i>Chilled instant/ ready meals with Rice and Noodles</i>	(Fried rice; Rice with dishes); (Hor fun; Udon)(exclude Spaghetti)	8	458	276	187 1,013
<i>Chilled dim sum</i>	(Shrimp dumpling; Siu mai)	10	556	118	418 822
<b>Other foods*</b>		12	295	198	12 623
<i>Breakfast cereals - Cold-served*</i>	(Cornflake; Muesli)	6	326	218	28 623
<i>Breakfast cereals - Hot-served</i>	(Oatmeal/oat drinks; Wheat drinks)	6	265	191	12 450
<b>Total</b>		<b>314</b>			

**Note:** n = number of items assessed

\* Indicates products with nutrient content claims and/ or nutrient comparative claims on salt/sodium included.

† Indicates same products with different series of varied sodium content; or sodium-containing sauces/seasonings can be added by consumers.

**Annex III: Comparison of sodium content in local foods collected in this study with overseas sodium reduction target**

Food	Sodium (mg/100g)		
	Local data		Range from overseas reduction target references*
	n	Avg	Max
<b>Non-prepackaged food</b>			
Western preserved sausages	4	933	1,000
Fried potatoes	13	370	690
Burgers	16	528	760
Pizza	10	594	790
<b>Prepackaged food</b>			
Salad dressing	5	828	1,200
Tomato paste/Ketchup	5	1,208	1,353
Western preserved meat	5	2,353	6,800
Western cookies	12	292	530
Canned baked beans	4	455	860

**Note:** n = number of items assessed

\* Ranges are from the Health Canada for 2016, the New York City Department of Health and Mental Hygiene for 2012 and 2014, and the Food Standards Agency of the United Kingdom for 2012.

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