For Discussion
on 11 February 2014

LegCo Panel on Food Safety and Environmental Hygiene

Total Diet Study

Purpose

This paper briefs Members on the progress of the first Total Diet Study (TDS) in Hong Kong conducted by the Centre for Food Safety (CFS).

Background

2. The first TDS in Hong Kong aims to estimate the dietary exposure of the Hong Kong population and various population sub-groups to a range of substances (including contaminants and nutrients) and thus assess any associated health risks. The Study commenced in March 2010 and would be completed in 2014 as scheduled. This Panel was briefed on the Study in May 2010.

The first TDS in Hong Kong

3. A TDS is a large project with many components. Foods commonly consumed are purchased, and prepared in the form as they would normally be consumed, i.e. table-ready, in a manner consistent with cultural habits, and then analysed for a range of substances. The analytical results showing the concentration of substances in food are combined with the food consumption data to obtain the dietary exposure. The dietary exposure estimated is then compared to the relevant reference values for chemicals or nutrients. Unlike food surveillance which measures exposure to various

substances by reference to the levels found in individual food items, the TDS focuses on exposure to the substances by reference to the whole diet.

4. The previous risk assessment studies conducted by the Food and Environmental Hygiene Department focused on individual food chemical hazards for a specific population group, usually the secondary school students in Hong Kong. With the consumption data from the population-based Food Consumption Survey becoming available in 2010, a TDS approach was adopted to obtain a more comprehensive and accurate estimation of the dietary exposure of the Hong Kong population to a range of substances.

5. A task force consisting of representatives from the Department of Health, the Government Laboratory and the Centre for Food Safety has been formed to formulate the plan and monitor the progress of the TDS.

Food Consumption Data

6. The food consumption data were taken from the Hong Kong population-based Food Consumption Survey conducted by CFS in 2005-2007. Data were obtained by two non-consecutive 24-hour dietary questionnaires of 5 008 Hong Kong adults aged 20-84 through a quota sampling by gender and age groups. A weighting based on the age and gender distribution in Hong Kong was applied to adjust for bias arising from the age-gender quotas. The survey captured over 1 400 food items that were being consumed by Hong Kong people.

Testing of substances

7. Substances tested in the TDS were selected on the basis of the following criteria: (a) recommendation from international authorities, (b) public health significance, and (c) public concern. On the other hand, certain substances which can be tested simultaneously with other selected substances were also included. In total, over 140 substances (including persistent organic pollutants, pesticide residues, metallic contaminants,

processing contaminants, mycotoxins and nutrients) have been covered in the study (see **Annex I**).

Development of food list

8. The TDS food list, including 150 food items, were developed based on the food consumption data derived from the Hong Kong Population-based Food Consumption Survey (see **Annex II**). Foods that were included in the TDS food list are food normally consumed by Hong Kong people. Also included were food items that are consumed in low level but carry particular substances of potential concern (e.g. methyl mercury in tuna, lead in lime-preserved eggs and aflatoxins in peanut butter) and food items associated with the presence of certain substances (such as food additives in processed food).

Fieldwork and laboratory analysis

9. CFS has commissioned the Chinese University of Hong Kong to carry out the fieldwork including food sampling and preparation. From March 2010 to February 2011, a total of 1 800 food samples (composing 150 food items, 3 samples for each item and collected on four occasions) were collected from local markets for the entire project. Three samples of each item were combined into one sample, resulting in a total of 600 composite samples prepared for laboratory analysis. The laboratory analysis was conducted mainly by the Food Research Laboratory of CFS. This task has been completed.

Dietary exposure estimation

10. A web-based computer system that was developed in-house, namely the Exposure Assessment System (EASY in short), is used to calculate dietary exposure.

Results of TDS

11. As of December 2013, seven reports have been released, covering the dietary exposure of the local population to (a) dioxins and dioxin-like polychlorinated biphenyls (PCBs), (b) inorganic arsenic, (c) polybrominated diphenyl ethers (PBDEs), (d) pesticide residues, (e) metallic contaminants, (f) acrylamide and (g) mycotoxins. Based on the findings of each study, relevant advice to the public and the trade was formulated by CFS.

(a) Dioxins and Dioxin-like PCBs

12. Dioxins and Dioxin-like PCBs are persistent organic pollutants (POPs) covered by the Stockholm Convention on Persistent Organic Pollutants. Some congeners of dioxins are carcinogenic to humans. Dietary exposure to these contaminants were 21.92 and 59.65 pg TEQ[1]/ kg body weight (bw)/month for the average and high consumers of the population respectively, which amounted to 31.3 per cent and 85.2 per cent of the health-based guidance value (70 pg TEQ/kg bw/month). Therefore, the general population was unlikely to experience major undesirable health effects of dioxins and dioxin-like PCBs. Among all the food groups, "fish and seafood and their products" contained the highest level of the contaminants (mean: 0.440 pg TEQ/g), followed by "eggs and their products" (mean: 0.137 pg TEQ/g), "fats and oils" (mean: 0.094 pg TEQ/g) and "meat, poultry and game and their products" (mean: 0.091 pg TEQ/g). In order to further reduce exposure, CFS advised the public to trim fat from meat and to choose low fat dairy products. Fish contains many essential nutrients, such as omega-3 fatty acids and high quality proteins. People should consume a variety of fish moderately, rather than being unduly worried about excessive exposure to dioxin (and thus reduce fish consumption).

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[1] The TEQ value was computed using the toxic equivalency factors (TEFs) established by WHO which were assigned to 17 PCDD/PCDF congeners and 12 dioxin-like PCB congeners for comparing their toxicities relative to the most toxic one TCDD.

(b) Inorganic arsenic

13. Arsenic is a metalloid that occurs in inorganic and organic forms. Inorganic arsenic is carcinogenic. Dietary exposure to inorganic arsenic were 0.22 μg/kg bw/day and 0.38 μg/kg bw/day for the average and high consumers in the population, respectively. The figures were below the $BMDL_{0.5}$ (benchmark dose lower confidence limit for a 0.5 per cent increased incidence of lung cancer in humans). The dietary exposure of the population in Hong Kong fell within the middle range of levels found in other countries and regions. "Cereals and their products", being staple foods for the local population were found to be the main dietary source of inorganic arsenic for the local population. They accounted for 53.5 per cent of the total exposure. Nevertheless these findings do not warrant changes to the existing basic dietary advice that we give out on healthy eating. Individuals who wish to reduce exposure to inorganic arsenic may consider choosing other cereals, which generally contain lower levels of inorganic arsenic, as part of their diet. They may also wash rice thoroughly, although without excessive washing as some nutrients may be lost, and discard the washed water before cooking. CFS also tendered advice to farmers, calling upon them to observe good agricultural practices and minimise inorganic arsenic contamination of foods, such as avoiding the use of arsenic-contaminated water for irrigation.

(c) PBDEs

14. PBDEs are a group of industrial chemicals used as flame retardants. These chemicals persist in the environment, including the air, water, soil and food, for a long period of time. PBDEs are generally found in higher concentration in fatty foods, such as some meats, fish, dairy products, fats and oils. PBDEs were found to be toxic to liver in animal studies. The dietary exposure to PBDEs for the average and high consumers in the population were below the Joint FAO/WHO Expert Committee on Food Additives (JECFA)'s estimated dietary exposure of the general population to PBDEs (i.e. 4 ng/kg bw/day). This level was not likely to be a significant health concern. The main dietary source of

PBDEs was "fish and seafood and their products" which contributed to 27.3% of the total exposure, followed by "meat, poultry and game and their products" (20.7%), "cereals and their products" (15.9%), and "fats and oils" (15.9%). Nevertheless, PentaBDE and OctaBDE, being soluble in fat, have a strong tendency to accumulate in body fat. To reduce the dietary exposure to PBDEs, members of the public are advised to reduce fat consumption, for example, by trimming fat from meat and meat products, consuming low-fat products, as well as preparing food with a lesser amount of fats and oils.

(d) Pesticides residues

15. Pesticides residues in vegetables have always been a concern to the public. The study concluded that the estimated dietary exposure of the local population to all 85 commonly encountered pesticide residues under four pesticide groups (namely organophosphorus pesticides (OPPs), carbamates, pyrethrins and pyrethroids, and dithiocarbamate metabolites) were unlikely to pose unacceptable health risks, given that all were well below their respective health-based guidance values. CFS advised the public to wash vegetables and fruits thoroughly in clean running water, and soak the vegetables in water for one hour and then rinse, or alternatively blanch the vegetables in boiling water for one minute and discard the water to minimise potential exposure to water soluble pesticide residues. To further reduce their exposure to pesticides, members of the public may also remove the outer leaves of the vegetables or peel the vegetables and fruits as appropriate. CFS also reminded farmers to observe good agricultural practices, such as using only pesticides registered with the competent authority and applying the minimum quantities necessary to achieve adequate pest control. The use of pesticides should also be in strict accordance with the label requirements. For example, the crops should not be harvested within the specified withholding period after the last pesticide application.

(e) Metallic contaminants

16. Metallic contaminants are often found in foods in trace amounts. Since these contaminants may accumulate in the human body and cause organ damage, their chronic toxicity is of particular concern. The study revealed that the estimated dietary exposure of the local population, including the high consumers, to the seven metallic contaminants analysed (i.e. aluminium, antimony, cadmium, lead, methylmercury, nickel and tin) were unlikely to pose unacceptable health risks, given that all were below their respective health-based guidance values. However, pregnant women have to observe a more stringent provisional tolerable weekly intake (PTWI) for methylmercury, i.e. 1.6 μg/kg bw/week, in order to protect the embryo and foetus. About 11% of women within the childbearing age (i.e. between 20 and 49) had dietary exposure to methylmercury exceeding the more stringent PTWI. Methylmercury is more toxic than mercury and may cause toxicity to nerves. Fish and other seafood are the major dietary source of methylmercury exposure in humans.

17. To minimise the health risks posed by metallic contaminants, CFS has issued advice for pregnant women, women planning pregnancy and young children on fish consumption. The advice specifies the type of fish that may be harmful when eaten too often or beneficial when eaten in moderation, in terms of their effect on children's IQ. Pregnant women, women planning pregnancy and young children are advised to avoid eating large predatory fish and the type of fish which may contain high levels of methylmercury, for example, tuna, alfonsino, shark, swordfish, marlin, orange roughy and king mackerel. However, the levels of methylmercury in most fish are low, especially fish that are smaller in size. The information is available from the CFS website. Fish contain many essential nutrients, such as omega-3 fatty acids and high-quality proteins. Therefore, moderate consumption of a variety of fish is recommended.

18. The aluminium levels in food found in the present TDS were similar to those found in the risk assessment study done in 2009. Since no reduction on the use of aluminium-containing additives by the trade was

observed, CFS has encouraged the trade to reduce the use of aluminium-containing additives or replace them with alternatives. Meanwhile, CFS has also reminded the trade to observe good agricultural and manufacturing practices to minimise metallic contamination of foods. We have advised the trade to obtain food supplies from reliable sources and maintain a good recording system to allow source tracing if needed.

19. Separately, the TDS results showed that the cadmium level of one Chinese spinach and one dried shiitake mushroom samples exceeded the legal limits. CFS has taken follow-up action and issued warning letters to the relevant food premises.

(f) Acrylamide

20. Acrylamide may be formed when foods are cooked or processed at high temperature (usually over 120°C). It is a genotoxic carcinogen and found to be toxic to the nervous system and reproductive and developmental systems of experimental animals. According to the TDS study, potato chips were found to contain the highest level of acrylamide (mean: 680 μg/kg), followed by fried potato (mean: 390 μg /kg) and zucchini (mean: 360 μg/kg). The dietary exposure to acrylamide of the average and high consumer in the local population was 0.21 and 0.54 μg per kg of body weight per day respectively. Their Margins of Exposure (MOE) were all far below 10 000 (847 – 1 459 for the average population, 334 – 576 for the high consumers). This may indicate a human health concern. The main dietary source of acrylamide for the local population was from "vegetables and their products" (52.4% of the total dietary exposure), particularly stir-fried vegetables (44.9% of the total dietary exposure). CFS stressed that the public should maintain a balanced and varied diet, consume at least three servings of vegetables a day, and moderate the consumption of fried foods such as potato chips and fried potatoes. To reduce the formation of acrylamide, food should not be cooked for too long or at too high a temperature. To reduce the level of exposure to acrylamide from vegetables, members of the public may consider blanching the vegetables

before frying, or cooking them by boiling or steaming. Some vegetables may also be eaten raw after washing.

21. Since vegetables are the main source of acrylamide intake for the population, CFS has updated the "Trade guidelines on reduction in acrylamide level" to include advice on special way to reduce acrylamide level in stir-fried vegetables. We have also advised the trade to refer to the trade guidelines in seeking ways to reduce the level of acrylamide in food during the selection of raw materials and the formulation of recipes and food processing conditions. CFS has disseminated such information to the trade through various publicity activities such as trade consultation forum and trade seminar, in order to reduce the level of acrylamide in food.

(g) Mycotoxins

22. Mycotoxins are toxic metabolites produced by moulds. Aflatoxins, a group of mycotoxins that is carcinogenic to humans, are more likely to be found in peanuts, tree nuts, corn, dried figs, cereals and their products. Nevertheless, the dietary exposure of the local population to aflatoxins was low. Based on the estimated aflatoxins intake and the prevalence of hepatitis B carriers in Hong Kong, aflatoxins contributed approximately eight cases of liver cancer in Hong Kong each year, which accounted for less than 1% of liver cancer annually. There is no cause for undue alarm. For other mycotoxins ("ochratoxin A", "fumonisins", "deoxynivalenol and acetyldeoxynivalenols", and "zearalenones"), all dietary exposure estimates of them were far below their respective health-based guidance values suggesting that the general adult population was unlikely to experience major undesirable health effects. CFS advised people to avoid consuming food that look mouldy or damaged. We have also reminded the trade to observe good agricultural and manufacturing practices; source food and ingredients from reliable suppliers; store food properly to minimise mycotoxin contamination of food.

Action taken by CFS

23. The seven completed TDS reports are available to the public through the CFS website. In addition, all available data from TDS have been submitted to the WHO Global Environmental Monitoring System /Food Contamination Monitoring and Assessment Programme (GEMS/Food).

Way forward

24. CFS will release the rest of the reports, i.e. the dietary exposure of the local population to organochlorine and certain nutrients, in phases in 2014. We will conduct an evaluation of the first TDS in 2014 after all reports have been issued. The evaluation will cover the conduct of the study, the method of testing and analysis, and the range of substances being tested, etc. Subject to the evaluation results, the second population-based Food consumption Survey will be planned accordingly, for the purpose of keeping food safety risks of concern on our radar screen.

Advice sought

25. Members are invited to note the progress of the first TDS in Hong Kong.

Food and Health Bureau
Food and Environmental Hygiene Department
February 2014

Annex I

List of substances covered in the 1st HKTDS

Persistent Organic Pollutants (POPs) (16)

1. Aldrin
2. Chlordane
3. DDT
4. Dieldrin
5. Dioxins
6. Endrin
7. Furans (refer to dibenzofurans)
8. Heptachlor (including heptachlor epoxide)
9. Hexachlorobenzene (HCB)
10. Mirex
11. Polychlorinated biphenyls (PCBs), dioxin-like
12. Toxaphene
13. Chlordecone (new POPs)*
14. Pentachlorobenzene (new POPs)*
15. Endosulfan (α, β and sulfate) (new POPs)
16. Hexachlorocyclohexane (α, β, δ and γ) (new POPs)

Pesticide Residues (excluding POPs) – Organophosphorus (48)

1. Acephate*
2. Azinphos, methyl-*
3. Bensulide*
4. Cadusafos*
5. Chlorpyrifos*
6. Chlorpyrifos, methyl-*
7. Coumaphos*
8. Diazinon
9. Dichlorvos*
10. Dicrotophos*
11. Dimethoate*
12. Disulfoton*
13. Edifenphos*
14. Ethion*
15. Ethoprophos*
16. Fenamiphos*
17. Fenitorthion
18. Fenthion*
19. Fosthiazate*
20. Isocarbophos*
21. Isofenphos, methyl-*
22. Malathion
23. Methamidophos*
24. Methidathion*
25. Mevinphos*
26. Monocrotophos*
27. Naled*
28. Omethoate*
29. Oxydemeton, methyl-*
30. Parathion
31. Parathion, methyl-
32. Phenthoate*
33. Phorate*
34. Phosalone*
35. Phosmet*
36. Phosphamidon*
37. Phoxim*
38. Pirimiphos, methyl-*
39. Profenofos*
40. Prothiophos*
41. Quinalphos*
42. Terbufos*
43. Tetrachlorvinphos*
44. Tolclofos, methyl-*
45. Triazophos*
46. Tribufos*
47. Trichlorfon*
48. Vamidothion*

Pesticide Residues (excluding POPs) – Organochlorine (1)

1. Dicofol (sum of 2,4'-dicofol and 4,4'-dichlorobenzophenone)*

Pesticide Residues (excluding POPs) –Pyrethrins and pyrethroids (15)

1. Bifenthrin*
2. Cyfluthrin
3. Cyhalothrin
4. Cypermethrin
5. Deltamethrin
6. Etofenprox*
7. Fenpropathrin
8. Fenvalerate
9. Flucythrinate*
10. Flumethrin*
11. Fluvalinate*
12. Permethrin
13. Pyrethrins*
14. Resmethrin*
15. Tefluthrin*

Pesticide Residues (excluding POPs) – Carbamates (20)

1. Aldicarb*
2. Benfuracarb*
3. Butylate*
4. Carbaryl*
5. Carbofuran*
6. Carbosulfan*
7. Cycloate*
8. S-ethyl dipropyl thiocarbamate (EPTC)*
9. Fenobucarb (BPMC)*
10. Formetanate hydrochloride*
11. Isoprocarb*
12. Methiocarb*
13. Methomyl*
14. Molinate*
15. Oxamyl*
16. Phenmedipham*
17. Pirimicarb*
18. Propamocarb*
19. Thiobencarb*
20. Triallate*

Pesticide Residues (excluding POPs) – Dithiocarbamate (2)

1. Ethylene thiourea (ETU)
2. Propylene thiourea (PTU)

Metallic Contaminants (9)

1. Aluminium
2. Antimony*
3. Arsenic, inorganic
4. Cadmium
5. Lead
6. Methyl mercury
7. Nickel*
8. Tin*
9. Vanadium*

Processing Contaminant (1)

1. Acrylamide

Mycotoxins (9)

1. Acetyldeoxynivalenols*
2. Aflatoxins (Sum of aflatoxins B1, B2, G1 and G2)
3. Deoxynivalenol (DON)*
4. Diacetoxyscirpenol*
5. Fumonisins (Sum of fumonisins B1, B2 and B3)*
6. Ochratoxin A*
7. Ochratoxin B*
8. T-2 and HT-2 toxins*
9. Zearalenones (Sum of zearalenone, zearalenol-alpha and zearalenol-beta)*

Other Contaminant (1)

1. Polybrominated diphenyl ethers (PBDEs)*

Nutrients – Fatty acids (4)

1. Monounsaturated fatty acid*
2. Polyunsaturated fatty acid*
3. Saturated fatty acid
4. Trans fatty acid

Nutrients – Elements (13)

1. Boron*
2. Calcium*
3. Cobalt*
4. Copper*
5. Iron*
6. Magnesium*
7. Manganese*
8. Molybdenum*
9. Phosphorus*
10. Potassium*
11. Selenium*
12. Sodium
13. Zinc*

Nutrients – Others (7)

1. Available carbohydrates
2. Cholesterol
3. Dietary fibre (total)
4. Energy
5. Protein
6. Sugars
7. Total fat

** Substances tested simultaneously*

Annex II

TDS food items

Cereals and their products:

TDS food item analysed	Food Consumption Survey food represented
Rice, white	White rice, glutinous rice, congee
Rice, unpolished	Unpolished rice and congee
Corn	Corns, baby corn
Noodles, Chinese or Japanese style	Chinese or Japanese noodles
Pasta, Western style	Western style pasta
Instant noodles	Instant noodles, instant rice noodles and instant flat noodles
Rice noodles	Rice noodles
Bread, plain	Plain bread, grain breads, other bread without inclusion
Bread, raisin	Raisin bread, other breads with inclusion (sweet)
"Pineapple" bun	“Pineapple” bun (all kinds)
Sausage/ham/luncheon meat bun	Bread with meat / seafood based filling; puff/pie with meat / seafood based filling; other bread with inclusion (savoury)
Chinese steamed bread	Plain Chinese steamed bun / roll
Biscuits	Biscuits, crackers, cookies
Cakes	Cake, muffin, waffle, pancake
Pastries	Puff, pie, tart, doughnut
Pastries, Chinese	Chinese pastry, traditional mooncake
Oatmeal	Oatmeal
Breakfast cereals	Breakfast cereal, corn flakes, wheat bran breakfast cereal
Deep-fried dough	Fried fritter, crispy dumpling, sesame ball, deep fried dumpling

Vegetables and their products:

TDS food item analysed	Food Consumption Survey food represented
Carrot/ Radish	Carrot, other root vegetables
Potato	Potato, other tuber vegetables
Potato, fried	Fried potatoes
Broccoli	Broccoli, cauliflower
Cabbage, Chinese	Chinese cabbage

Cabbage, Chinese flowering	Chinese flowering cabbage, other brassica leafy vegetables, vegetables not specified
Cabbage, European variety	European variety cabbage
Cabbage, Petiole Chinese	Petiole Chinese cabbage, Shanghai cabbage
Celery	Celery, other stalk and stem vegetables
Chinese kale	Chinese kale
Chinese spinach	Chinese spinach
Leaf mustard	Leaf mustard
Lettuce, Chinese	Chinese lettuce, Indian lettuce
Lettuce, European	European lettuce, other leafy vegetables
Mung bean sprout	Mung bean sprout, other sprouts
Spinach	Spinach
Water spinach	Water spinach
Watercress	Watercress
Bitter melon	Bitter melon
Cucumber	Cucumber, old yellow cucumber
Hairy gourd	Hairy gourd, other cucurbits
Pumpkin	Pumpkin
Sponge gourd	Sponge gourd, water gourd
Wax gourd	Wax gourd
Zucchini	Zucchini
Eggplant	Eggplant
Sweet pepper	Sweet peppers, other peppers
Tomato	Tomato, other fruiting vegetables
Garlic	Garlic
Onion	Onion, other bulb vegetables
Spring onion	Spring onion, other green bulb vegetables
Preserved vegetables	Preserved vegetables
Mushroom, dried shiitake	Dried shiitake mushroom, other dried mushrooms
Mushrooms	Fresh mushrooms
Ear fungus	Ear fungus, other edible fungus

Legumes, nuts and seeds and their products:

TDS food item analysed	Food Consumption Survey food represented
Green string beans, with pod	Green string beans with pod, other legume vegetables and pulses
Mung bean vermicelli	Mung bean vermicelli, mung bean starch sheet
Beancurd	Beancurd, soya bean, other soya bean products
Fermented bean products	Fermented bean products / paste / sauce
Peanut	Peanut, other tree nuts and oilseed
Peanut butter	Peanut butter, other tree nuts and oilseed paste

Fruits:

TDS food item analysed	Food Consumption Survey food represented
Apple	Apple, other pome fruits
Banana	Banana, other assorted tropical and sub-tropical fruits (inedible peel)
Dragon fruit	Dragon fruit
Grapes	Grapes, all berries
Kiwi fruit	Kiwi fruit
Longan / Lychee	Longan, lychee
Mango	Mango
Melons	Cantaloupe, smooth skin melon
Orange	Orange, other citrus fruits, fruits not specified
Papaya	Papaya
Peach	Peach, other stone fruits
Pear	Pears
Persimmon	Persimmon, other assorted tropical and sub-tropical fruits (edible peel)
Pineapple	Pineapple
Plum	Plum, prune
Pummelo /Grapefruit	Pummelo, grapefruit
Watermelon	Watermelon

Meat, poultry and game and their products:

TDS food item analysed	Food Consumption Survey food represented
Beef	Beef and veal meat
Mutton	Lamb and mutton
Pork	Pork meat, meat and game not specified
Ham	Ham, Chinese ham, other cured meat
Luncheon meat	Luncheon meat
Barbecued pork	Barbecued pork, barbecued pork ribs
Roasted pork	Roasted pork, roasted suckling pig

Pig liver	Pig liver, other animal offals
Chicken meat	Chicken meat, other poultry meat
Chicken, soy sauce	Soy sauce chicken, “Lo Shui” (Chinese marinade) duck and goose
Roasted duck/goose	Roasted duck, goose, chicken and pigeon
Meat sausage	Meat and poultry sausage and ball

Eggs and their products:

TDS food item analysed	**Food Consumption Survey food represented**
Egg, chicken	Chicken egg, other eggs
Egg, lime preserved	Lime preserved egg
Egg, salted	Salted egg

Fish and seafood and their products:

TDS food item analysed	**Food Consumption Survey food represented**
Fish, Big head	Big head fish
Fish, Mandarin fish	Mandarin fish
Fish, Grass carp	Grass carp, other carps, other freshwater fish
Fish, Golden thread	Golden thread, cod and cod-like fishes, Mackerel, Jack Mackerel and Mackerel-like fishes, other marine fish, fish offals
Fish, Grouper	Groupers
Fish, Horse head	Horse head fish
Fish, Pomfret	Pomfret
Fish, Sole	Sole, other flat-fishes
Fish, Tuna	Tuna and bonito, other predatory fish (e.g. shark and swordfish)
Fish, Grey mullet	Grey mullet
Fish, Salmon	Salmon, other diadromous fish
Fish, Yellow croaker	Yellow croaker, croaker, white croaker
Fish, Dace, minced	Minced dace, dace
Fish ball/fish cake	Fish ball, fish cake
Shrimp/ Prawn	Shrimp, prawn, other crustaceans
Crab	Crabs
Oyster	Oyster
Scallop	Scallop, other mollusks (bivalve or univalve)
Squid	Squid, other cephalopods

Dairy products:

TDS food item analysed	Food Consumption Survey food represented
Milk, whole	Whole milk, including flavoured milk and fortified milk
Milk, skim	Skim milk, including flavoured milk and fortified milk
Cheese	Processed cheeses
Yoghurt	Yoghurt, fermented beverage (dairy base)
Ice-cream	Ice cream

Fats and oils:

TDS food item analysed	Food Consumption Survey food represented
Butter	Butter, animal fats and oils
Oil, vegetable	Vegetable oil, fats and oils not specified

Beverages, alcoholic:

TDS food item analysed	Food Consumption Survey food represented
Beer	Beer, ale
Red wine	Red wine, other alcoholic beverages

Beverages, non-alcoholic:

TDS food item analysed	Food Consumption Survey food represented
Tea, Chinese	Chinese tea, flavoured tea, tea not specified, non-alcoholic beverages not specified
Tea, milk tea	Milk tea
Coffee	Coffee
Malt drink	Malt drink, chocolate drink
Soybean drink	Soybean drink
Fruit and vegetable juice	Fruit and vegetable juice or juice drink
Carbonated drink	Carbonated drink, icy drink, sports drink
Tea, chrysanthemum	Chrysanthemum tea, other herbal tea, honey drink
Water, bottled, distilled	Bottled distilled water, bottled mineral/spring water, bottled drinking water
Water, drinking	Drinking water

Mixed dishes:

TDS food item analysed	Food Consumption Survey food represented
Siu Mai	All kinds of “siu mai” dim sum, except beef “siu mai”
Dumpling, steamed	Steamed dumpling, other steamed dim sum with meat and seafood
Dumpling, pan-fried	Pan-fried dumpling, other fried dim sum with meat
Dumpling, including wonton	Dumpling in soup, wonton, other dim sum not specified
Steamed barbecued pork bun	Steamed barbecued pork bun, other steamed bun with filling
Turnip cake	Turnip cake, other Chinese puddings
Steamed minced beef ball	Steamed minced beef ball, beef “siu mai”
Glutinous rice dumpling	All kinds of glutinous rice dumpling
Steamed rice-rolls with filling	All kinds of steamed rice-rolls with filling
Steamed rice-rolls, plain	Plain steamed rice-rolls
Chinese soup	Chinese-style soups, broth / bouillon
Hamburger	Hamburger, other burger

Snack foods:

TDS food item analysed	Food Consumption Survey food represented
Potato chips	Potato chips, other snack foods

Sugars and confectionery:

TDS food item analysed	Food Consumption Survey food represented
Chocolate	All kinds of chocolate
Granulated white sugar	Granulated white sugar, other kinds of sugars

Condiments, sauces and herbs:

TDS food item analysed	Food Consumption Survey food represented
Table salt	Table salt, other salts, seasoning powders
Soya sauce	Soya sauce, other sauces
Oyster sauce	Oyster sauce, other alike products
Tomato paste/ ketchup	Tomato paste, ketchup, spaghetti sauce
Cornstarch	Corn starch, starch flour not specified