Radioactivity in Food
Source of Radioactivity

- Naturally occurring radioactivity
- Nuclear power plant accident
- Nuclear weapon
Nuclear Power Plant Accident

- Radioactivity may be released into the surrounding area

- Ways of dispersion
  - Direct exposure
  - Winds
  - Rainfall
Food Contamination

- Radioactive substances are deposited on plants, soil or water
- They might enter food chain
- Plants and animals are contaminated by
  - surface contamination
  - tissue contamination after inhalation
  - ingestion of contaminated nutrients
- People are at risk after ingestion of the contaminated food
Possible Health Effects

- **Acute health effect**
  - nausea, vomiting, extreme tiredness, hair loss, skin burns and diminished organ function

- **Chronic health effect**
  - increase the risk of cancer
Radionuclides: Iodine-131(I-131), Caesium-134(Cs-134) and Caesium-137(Cs-137)

- I-131, Cs-134 & Cs-137 do not naturally occur in food
- They are artificially produced fission products
- Presence in food due to possible contamination from nuclear reactor operations or military nuclear operations
Standard for Radiation Testing Level

- CFS currently adopts the standards laid down by the Codex Alimentarius Commission in the Guidelines Levels for Radionuclides in Foods Contaminated following a Nuclear or Radiological Emergency (Guideline Levels)

<table>
<thead>
<tr>
<th>Radionuclides</th>
<th>Codex Guideline Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iodine-131</td>
<td>100 Bq/kg</td>
</tr>
<tr>
<td>Caesium-134</td>
<td>1,000 Bq/kg</td>
</tr>
<tr>
<td>Caesium-137</td>
<td>1,000 Bq/kg</td>
</tr>
</tbody>
</table>
Reduce the Level of Radionuclides in Food

- By suitable food preparation
  - e.g. Washing, brushing, scrubbing or peeling
- By storing contaminated food for prolonged times to allow radioactive decay of short-lived radionuclides
Food Surveillance

Import Level

- Inspect imported food by hand-held survey meter for surface contamination
Food Surveillance

Import, Wholesale and Retail Level

- Take food samples
- Use Contamination Monitoring System (CMS) for examination
Food Surveillance

Import, Wholesale and Retail Level

- Food consignment failing hand-held survey meter or CMS screening will be held
- Samples will be sent to Government Laboratory for further quantitative analysis
Testing on Radiation Level in Imported Food from Japan
Background

- Earthquake at Japan on 11 March 2011
- The earthquake triggered powerful tsunami
- Fukushima Daiichi Nuclear Power Plant was damaged by the tsunami
- Radioactive substances have been released in the environment
- Certain foods in a number of prefectures had been contaminated
- At levels hazardous to human health
Food Surveillance

- Since 12 March 2011, the Centre for Food Safety (FCS) stepped up surveillance on radiation level of imported food from Japan

- Including vegetables, fruits, milk, meat, aquatic products, milk powder and other processed foods
Food Surveillance

Result of Tested Samples

As at 31 July 2013, more than 143,000 samples have been tested

| Iodine-131 level in 3 samples exceeded the standards in the Guideline Levels |
|-----------------|-----------------|-----------------|
| 1 White Radish  | 1 Turnip        | 1 Spinach       |
| 260 Bq/kg       | 800 Bq/kg       | 1,000 Bq/kg     |

| 47 samples contained low levels of radioactivity but not exceeding the Guideline Levels |
|-----------------|-----------------|-----------------|
| 2 Vegetables    | 1 Oats          | 44 Tea Products |

1 White Radish 260 Bq/kg
1 Turnip 800 Bq/kg
1 Spinach 1,000 Bq/kg
2 Vegetables
1 Oats
44 Tea Products
Section 78B Order

- Director of Food and Environmental Hygiene make an order under Section 78B of Public Health and Municipal Services Ordinance, Cap 132
- Prohibits import and supply of the following food harvested, manufactured, processed or packed on or after 11 March 2011 from the five affected prefectures in Japan, namely Fukushima, Ibaraki, Tochigi, Gunma and Chiba -
  - All fruits, vegetables, milk milk beverage and dried milk
  - All chilled or frozen game, meat, poultry, poultry eggs, live, chilled or frozen aquatic products, unless accompanied by a certificate issued by the competent authority of Japan certifying the radiation levels do not exceed the standards laid down by the Guideline Levels

<table>
<thead>
<tr>
<th>Unsatisfactory samples</th>
<th>Iodine-131 level in 3 samples exceeding the Guideline Levels</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
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Section 78B Order

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Order No. 4030/2013
Date: 24 March 2013

To All Persons

This Order is effective at 12.00 noon on 24 March 2013.

I have been authorised to issue this Order in relation to the food referred to as 'Alexon', a commercial preparation sold by Whispan China Ltd. As a measure to prevent the spread of any disease caused by the consumption of such a foodstuff, an Order has been issued under Section 78B of the Public Health and Social Services Ordinance (Chapter 118) to be as follows:

a. the food referred to above be seized, detained and held by any person having custody of the foodstuff, and the detaining person shall give the seized food in due course (not exceeding 48 hours) to the Director of Food and Environmental Hygiene for the purpose of this Order;

b. any person who in any way supplies, communicates or hands over the foodstuff to any person in breach of this Order shall be guilty of an offence.

If you fail to comply with any of the provisions of this Order, you may, by virtue of this Order or any other Order, or any Order of or in pursuance of this Order, be liable to prosecution under the Public Health and Social Services Ordinance (Chapter 118) for any offence.

Dated 24 March 2013

[Signature]

Director of Food and Environmental Hygiene
Section 78B Order

- The Order has taken effect on 24 March 2011 and is still in force
- Contravene a term of the Order commits an offence and is liable on conviction to a fine of HK$100,000 and to imprisonment for 12 months
CFS agreed to accept certificate on radiation levels issued by the competent authority of Japan for importation of
– aquatic products with effect from 8 November 2011
– meat, poultry and poultry eggs with effect from 21 March 2012

Thereafter, importation of such food with valid certificate from the five affected prefectures is allowed
Sample of Certificate on Radiation Levels

Sample of Certificate on radiation levels in aquatic products

Sample of Certificate on radiation levels in game, meat, poultry and poultry eggs
Conclusion

- The risk of Fukushima nuclear plant event has not been cleared
- Radioactive isotope Caesium-137 has a half-life of several ten years
- The order on prohibition of importation of food from the affected 5 prefectures in Japan is required to be maintained
- To ensure the safety of imported food from Japan, CFS continues to monitor closely the situation in Japan and the radiation testing results of food samples in order to formulate surveillance programme according to risk assessment