

APEC Workshop on Food Security

Risk Reduction and Quality Assurance in Food Safety: A Japanese Perspective

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Trustee, International Life Sciences Institute and Research Foundation

Brief Outline of Ajinomoto Group

- ❑ Founded in 1909 after the discovery of monosodium glutamate as a seasoning in 1908
- ❑ Products: Processed Foods, Frozen Foods, Beverages, Seasonings, Amino Acids for Food and Feed, Pharmaceuticals, Specialty Chemicals
- ❑ Annual Sales: 14 Billion USD
- ❑ Plants and offices in 26 countries and regions
- ❑ Group Companies: 115
- ❑ Group employees: ~28000

Food Security

*“Food security exists when all people, at all times, have physical and economic access to sufficient, **safe and nutritious** food that meets their dietary needs and food preferences for an active and healthy life”.
(World Food Summit, 1996)*

Outline of Presentation

- **Situation in Japan**
- **Microbial Risk and Chemical Risk**
- **Role of Risk Reduction and Quality Assurance**
 - **Supply chain management**
 - **Informing the consumer**

Japan is a Major Importer of Foods

□ Domestic Production	(1965)	(2011)
■ Calorie Based:	73%	39%
■ Price Based:	86%	66%

Ministry of Agriculture Forestry and Fisheries 2012

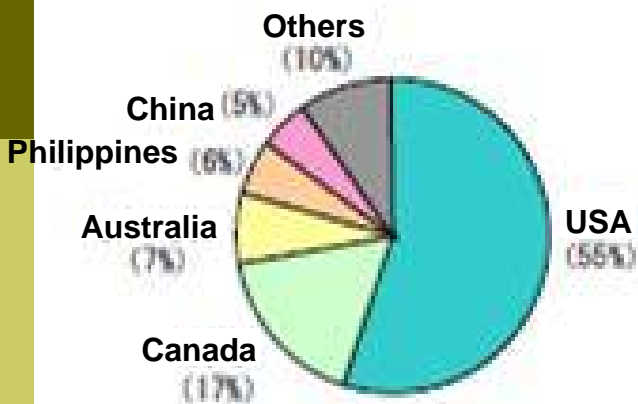
- Grains, Legumes, Sugars, Oils:
 - Under 30% self sufficiency

Ministry of Agriculture Forestry and Fisheries 2009

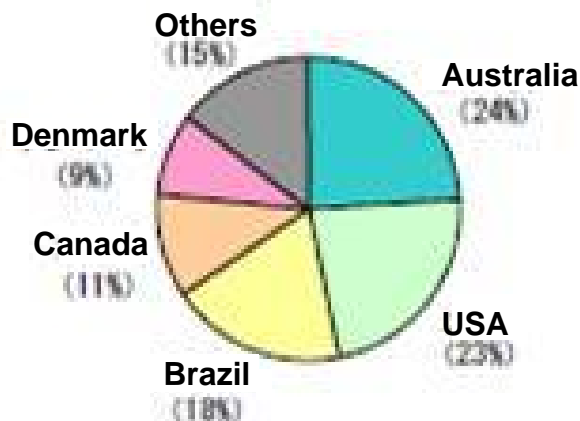
Japan imports food from around the world

Ministry of Health, Labor and Welfare Statistics 2007

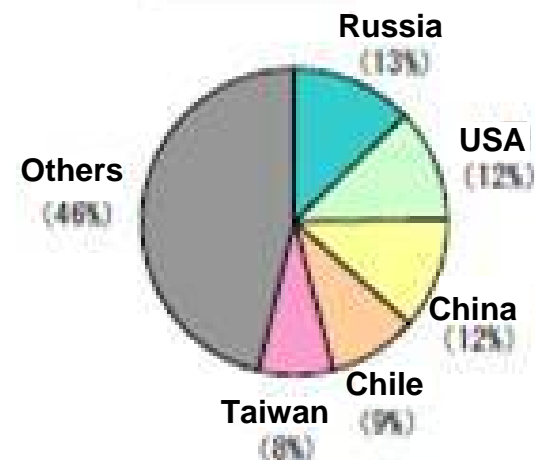
Agricultural



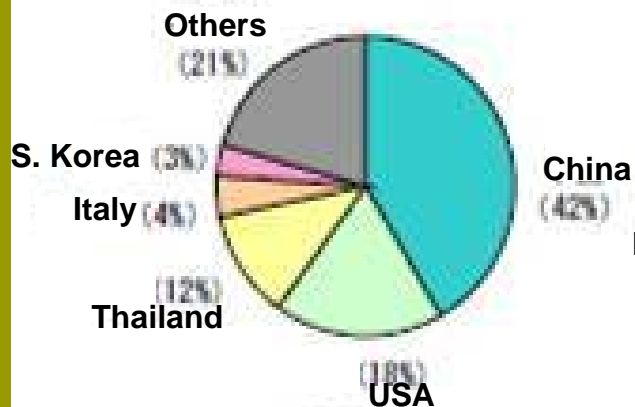
Meat



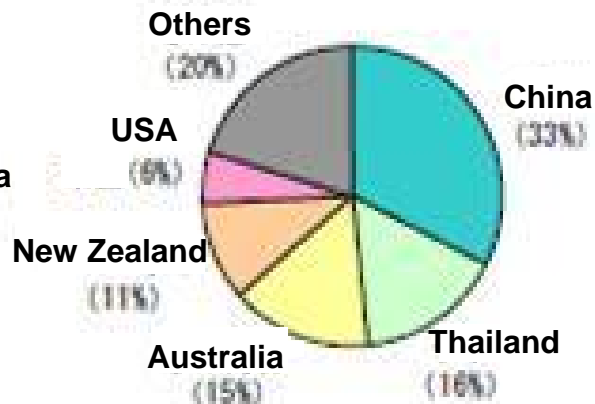
Fishery



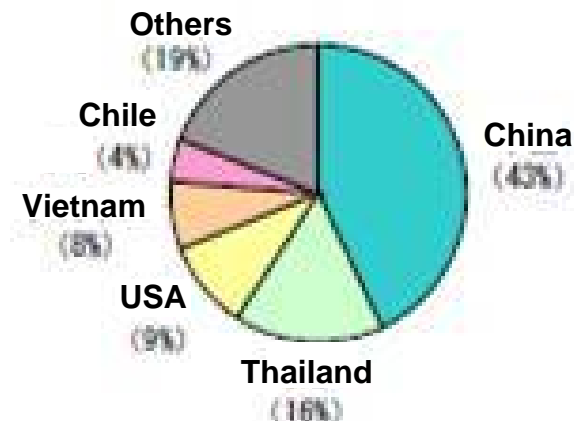
Processed Agricultural Products



Processed Meat Products



Processed Fishery Products



Examples of check points in imported food

Antibacterial agents etc.:

antibiotics, synthetic antimicrobials, hormones etc.

Pesticide residue:

organophosphorus, organochlorine, carbamates and pyrethroid agents etc.

Food additives:

preservatives, colorings, sweeteners, antioxidants, anti-fungals etc.

Compositional standards etc.: (Microbiological and Poisons)

check points written in the compositional standards (viable bacteria count, coli groups, *Vibrio parahaemolyticus* etc.), pathogenic microbes(enterohemorrhagic *E. coli* O157 and *Listeria*), shelfish poison (diarrheal, paralyzing) etc.

Mycotoxins:

aflatoxin, deoxynivalenol, patulin etc.

GM foods:

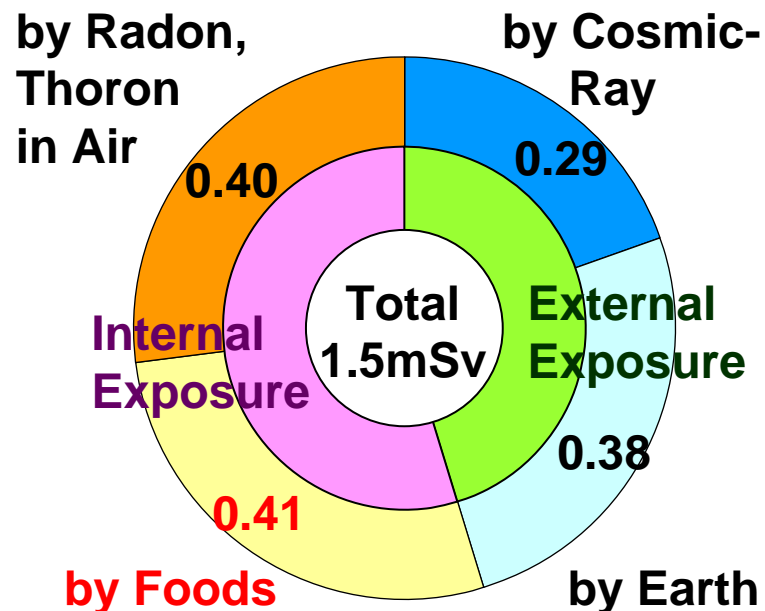
GM foods and additives not evaluated as safe

Irradiation:

with or without irradiation

Radioactivity Standards

Exposure level
from nature
In Japan:
1.5mSv/person/year



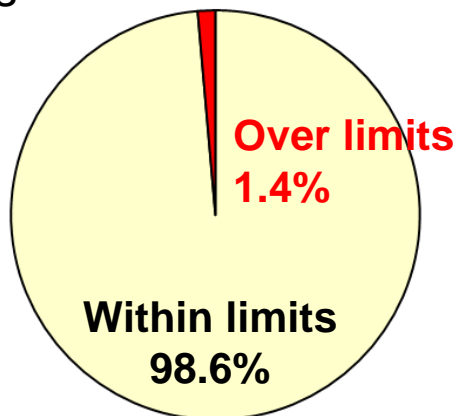
New Limits of Radioactive Cesium

Food Group	Limit (Bq/kg)
Drinking water	10
Milk	50
General Foods	100
Infant Foods	50

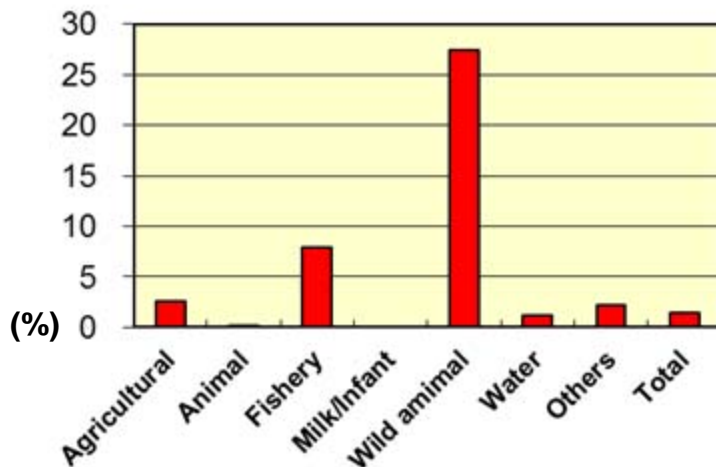
Based on acceptable limit, 1mSv/y,
by Codex Alimentarius Commission

Checking of Radioactive Substrates in Foods

Excess rate of limits
after 2012 April
(91,740 samples)

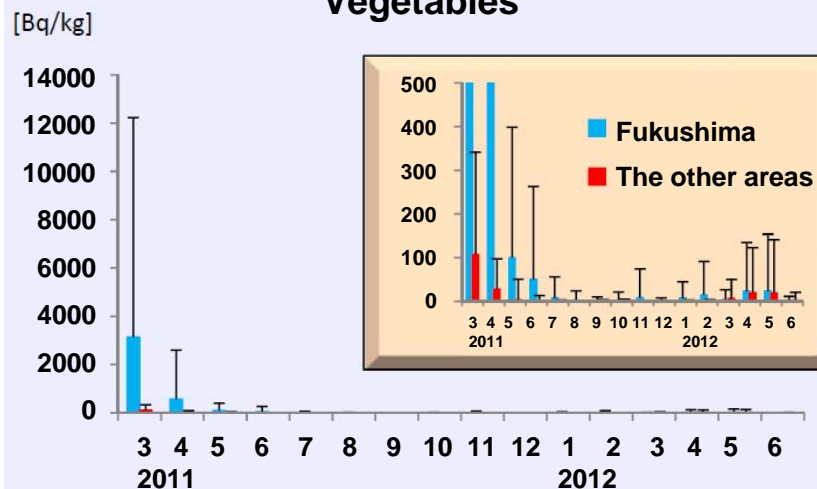


Excess rate of food groups

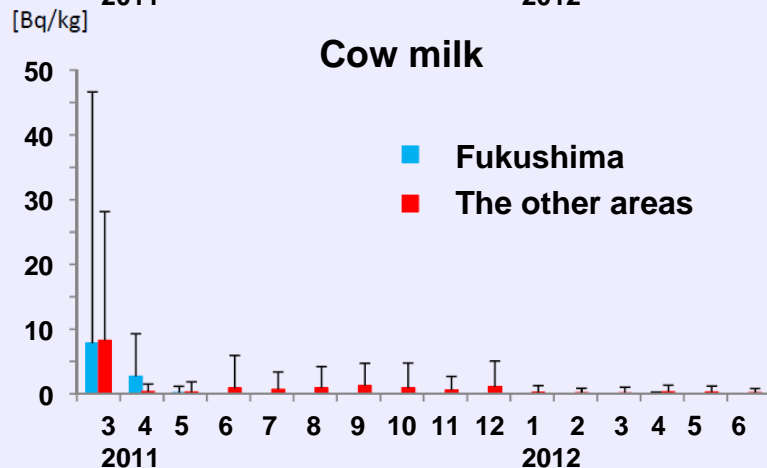


Change of radioactive cesium in foods

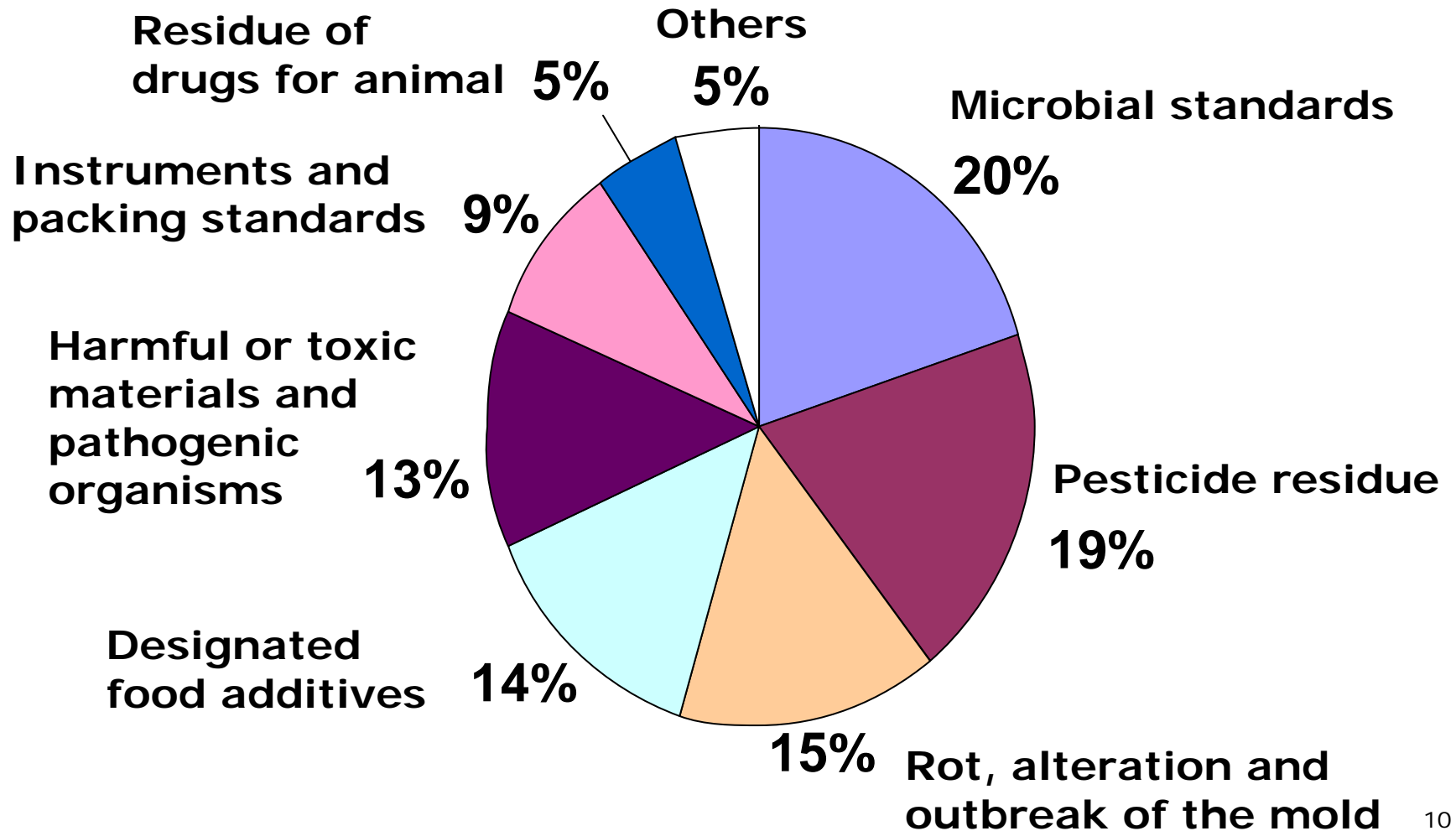
Vegetables



Cow milk



Infractions sorted by inspection category



Violations Low

Ministry of Health, Labor and Welfare Statistics 2010

□ USA

- Import Applications: 214,590
- Imported Weight: 11,860,686 tons
- Violations: 152 (**0.7% of tested samples**)

□ China

- Import Applications: 607,994
- Imported Weight: 3,977,749 tons
- Violations: 322 (**0.3% of tested samples**)

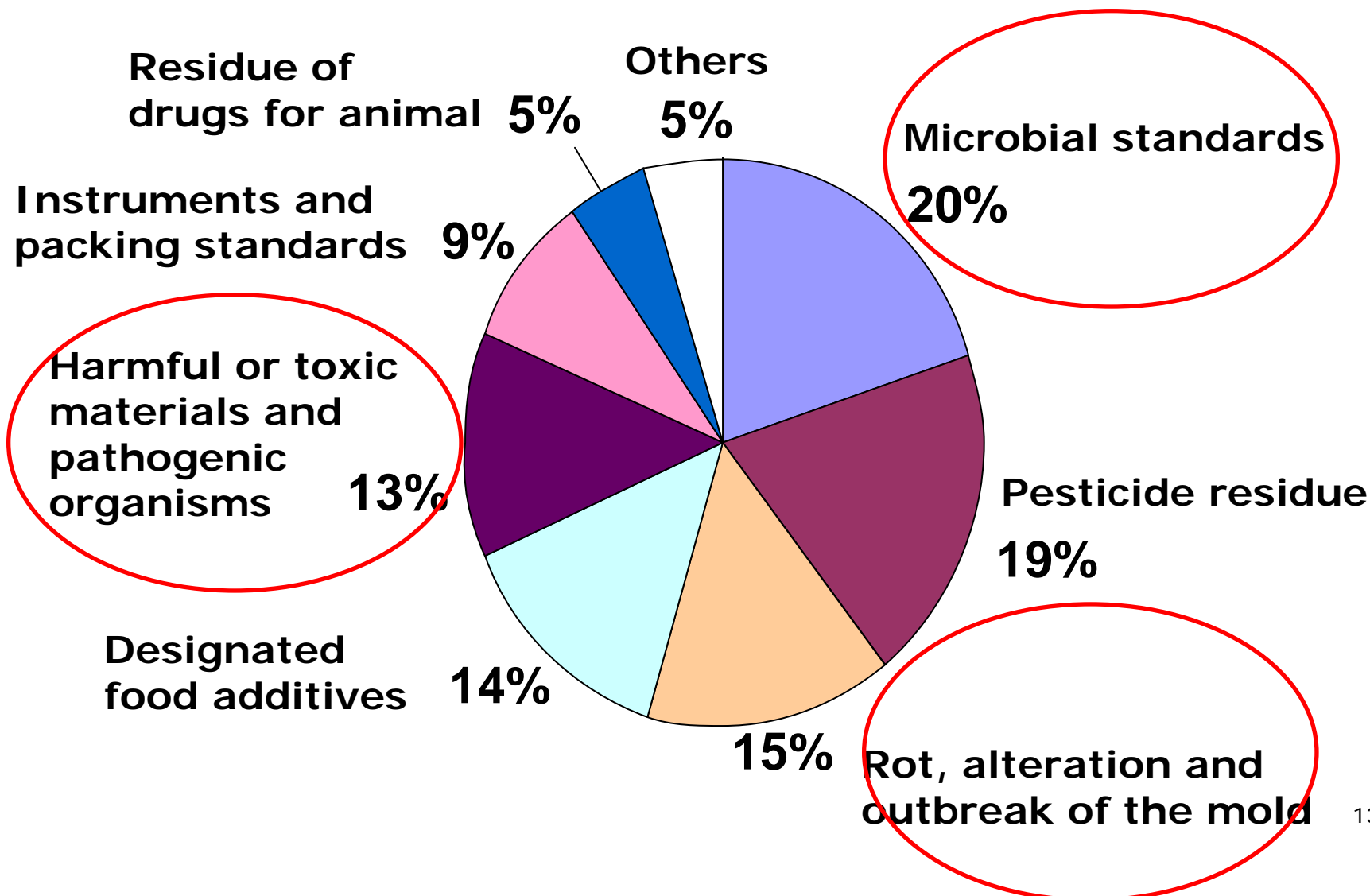
□ Vietnam

- Import Applications: 43,924
- Imported Weight: 298,735 tons
- Violations: 128 (**0.9% of tested samples**)

Foodborne Disease

- ❑ The global incidence of foodborne disease is difficult to estimate, but it has been reported that in 2005 alone 1.8 million people died from diarrhoeal diseases. A great proportion of these cases can be attributed to contamination of food and drinking water. (WHO 2007)
- ❑ CDC estimates that each year roughly 1 in 6 Americans (or 48 million people) gets sick, 128,000 are hospitalized, and 3,000 die of foodborne diseases. (CDC 2011)

Microbiological Risk



Foodborne Illness and Nutritional State

- ❑ Microbial risk influenced by physiological and nutritional state of population
- ❑ Adequate nutrition also Important
 - Nutrient deficiency still a problem
- ❑ Link between Food safety and Nutrition
- ❑ More data needed on interrelationship between microbial risk and nutrition

Amino Acid(Lysine) and Vitamin Fortification for Post-Weaning Food in Ghana



Collaboration with US and Japanese Government, Ghana University, Local Women's Groups, NGOs, DSM



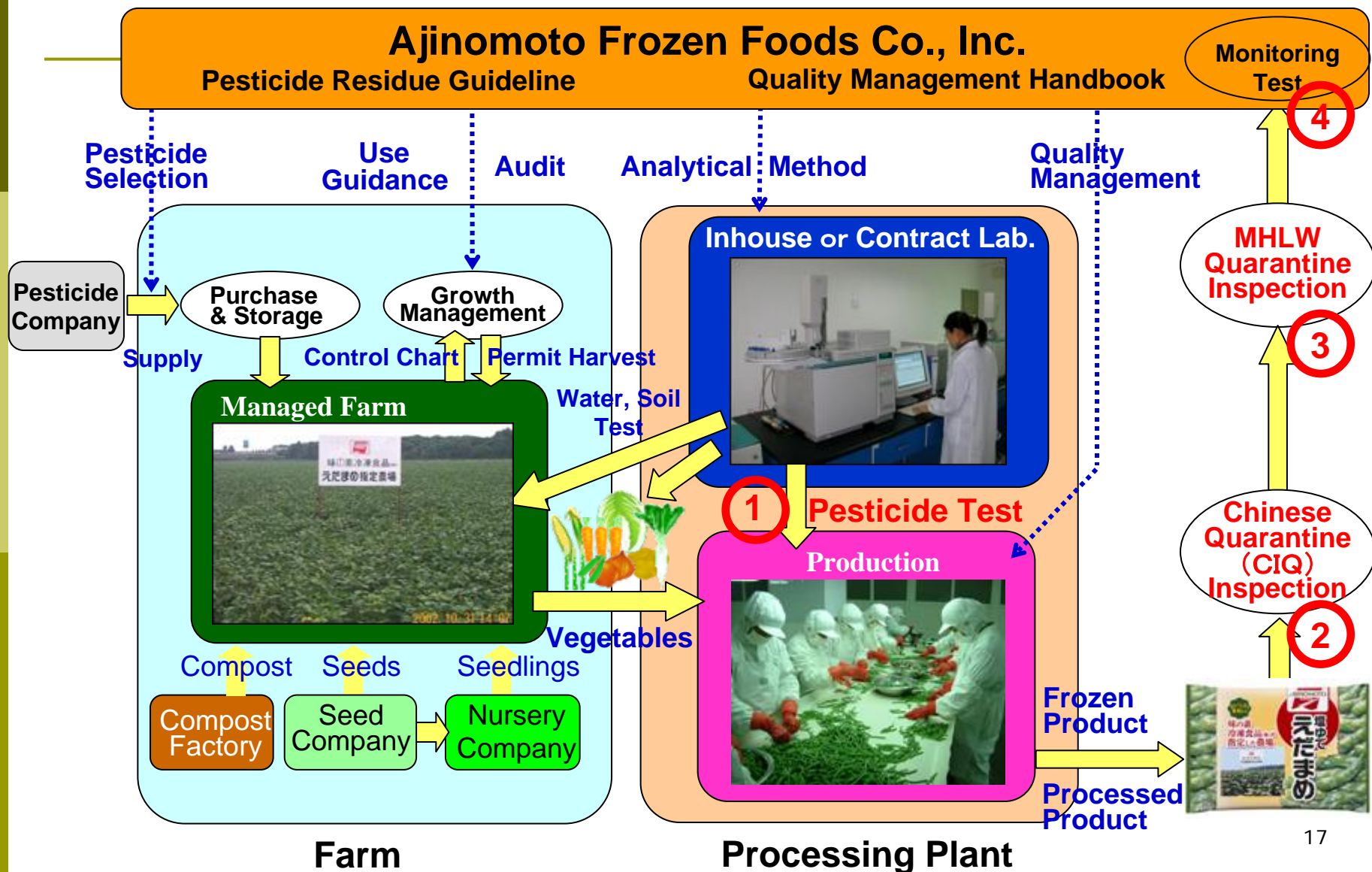
A Company Perspective: Establishing Trust in the Supply Chain

- ❑ Risk assessment of supplier
 - New supplier
 - Risk assessment including compliance
 - Periodic audits

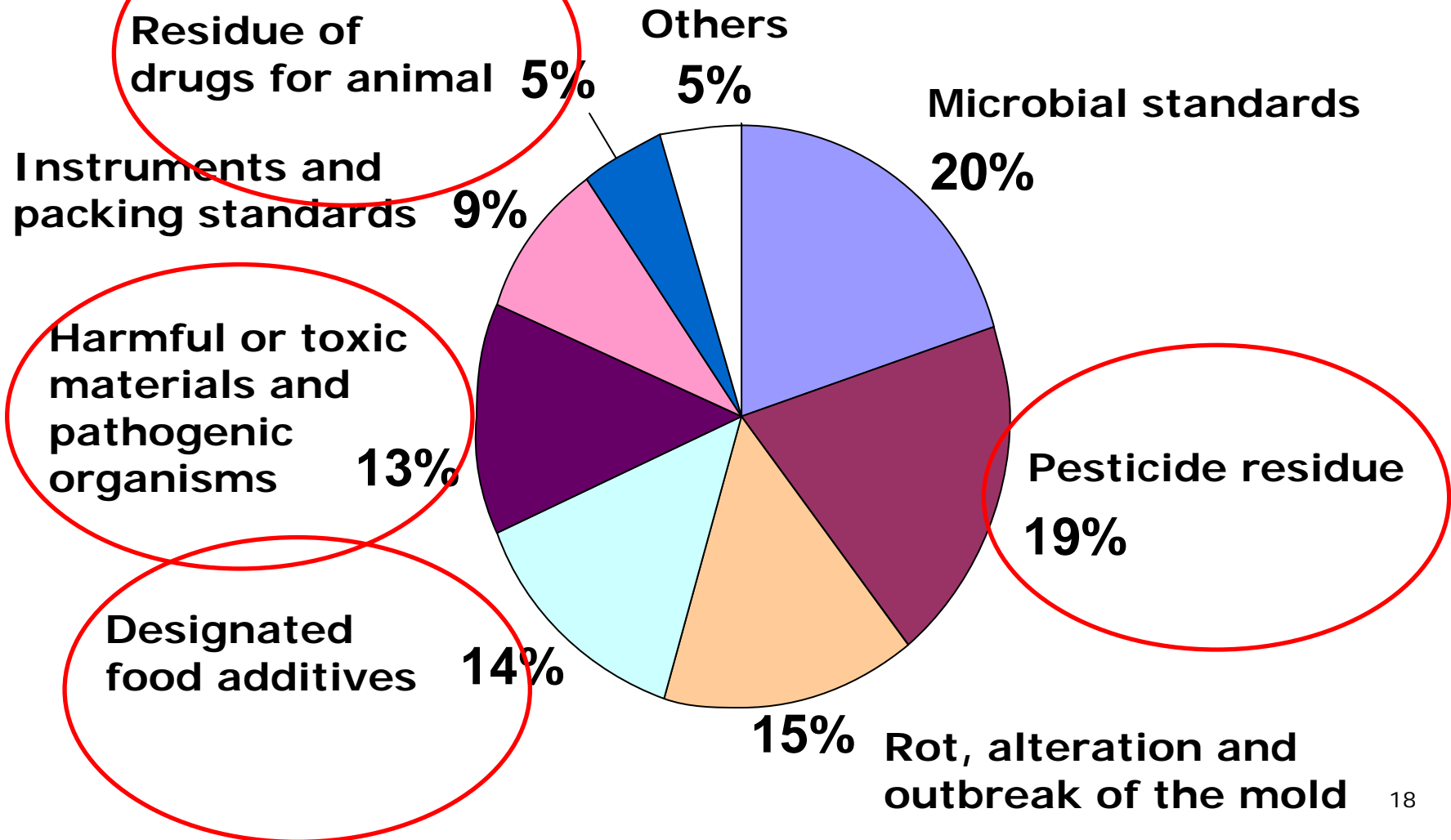
- ❑ Trust Ranking
 - Selecting core suppliers
 - Low ranking suppliers cut or advised to improve
 - Help improve quality for selected suppliers

Capacity Building Important !!

Quality Management of Imported Food Ingredients



Chemical Risk



Inadvertent or deliberate contaminants and adulterants

Ideally:

Quality of material on market

Should be equivalent to

Quality of material used for safety assessment

However:

Specifications are set so everyone can measure and they do not become barriers to trade

Risks:

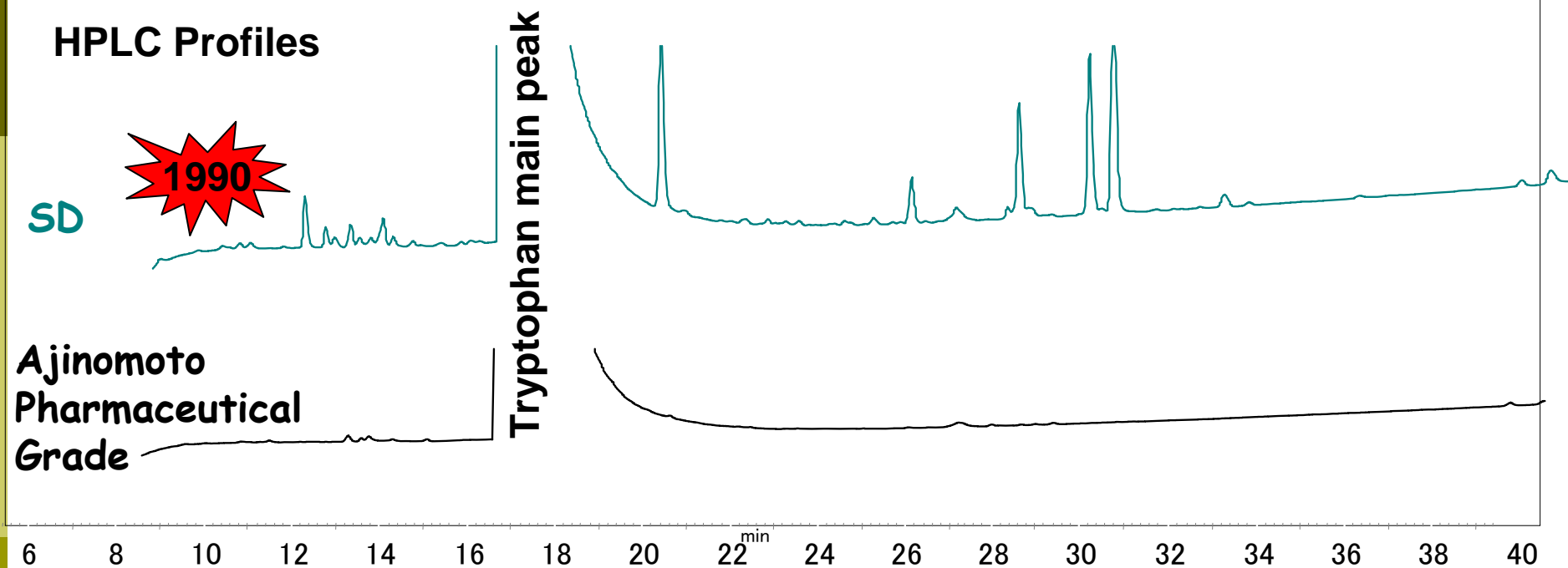
1. New contaminants arising from new processes not covered
2. Deliberate attempt to cheat system by using adulterants that pass specification tests

Inadvertent Contaminants

□ Example of Problem

- Tryptophan Eosinophilia Myalgia Syndrome
- Tryptophan: Amino Acid used mainly in US as supplement to aid sleep
- Low quality material made by Japanese company (SD) resulted in 37 deaths in USA
- Problem with impurities (but **within specifications**)

Impurities in a Ingredient: Tryptophan



Potential Causes

- Introduction of new genetically modified strain
- Anthranilic acid used as fermentation substrate
- Less activated carbon used for problem lot

Specifications Important (Response to Tryptophan incident)

- ❑ **Europe (EP)**
 - Specifications for Tryptophan tightened (require HPLC)

- ❑ **USA (USP)**
 - Tryptophan use made illegal in supplements (until 1994)
 - Import ban (until 2005)
 - Revised specifications in 2010(HPLC)

- ❑ **Japan**
 - Any genetic modification made in producing strain of a food ingredient must be reported to the Government
 - Food Safety Commission assesses the need for safety evaluation
 - Need to present equivalency data

- ❑ **Ajinomoto**
 - Strict rules for introducing new strains
 - Impurity profiles checked

Deliberate adulterants

- ❑ **Melamine to falsify nitrogen content**
- ❑ **Diethylene glycol used as glycerin**
- ❑ **Oversulfated chondroitin sulfate in place of heparin**

A Company Perspective: Food Defense Standards

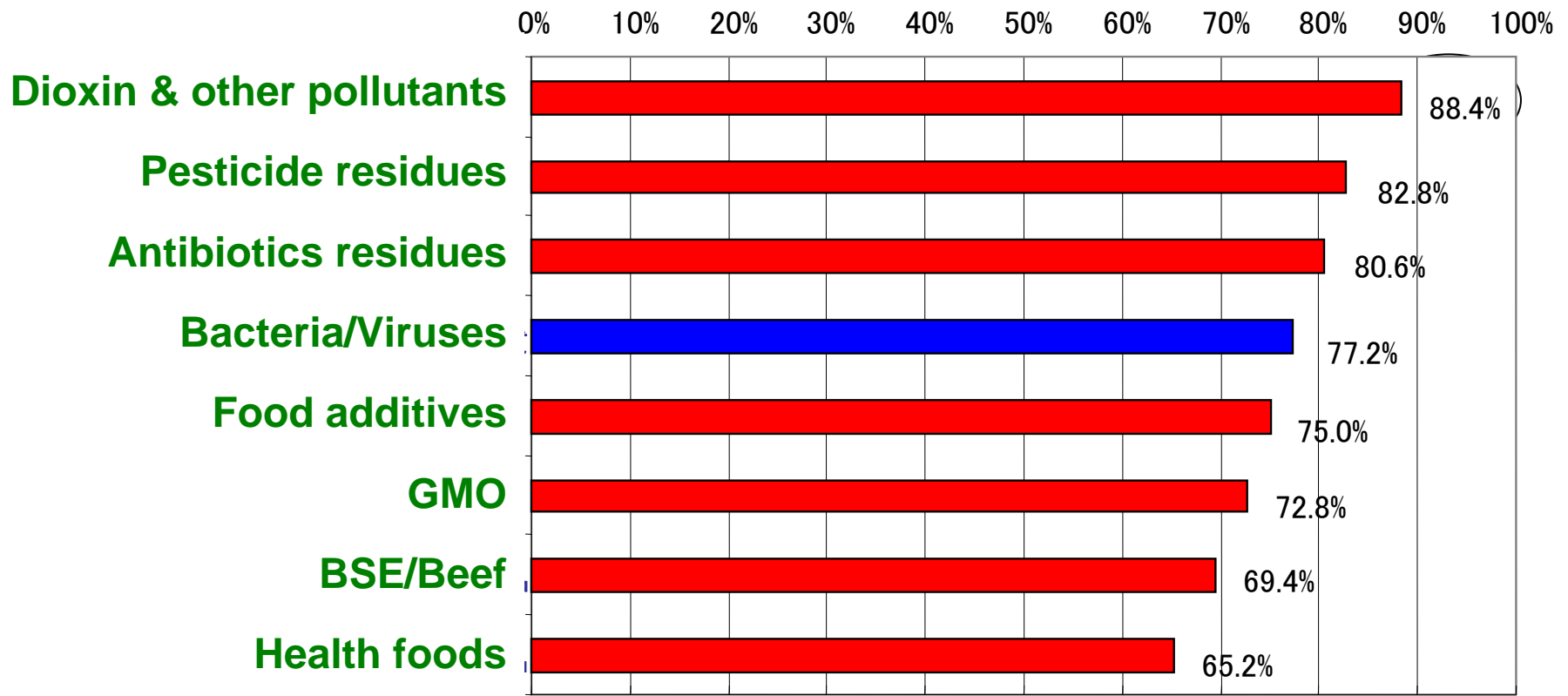
- **Purpose :**
Prevent from intentional contamination of hazardous, poisonous, and toxic materials by malicious people

- **Point of view of the standard : priority issue are 1,3**
 - ✓ **Prevention of intentional contamination by outsiders**
 - ✓ **Prevention of intentional contamination by employees**
 - ✓ **Trace back in the production, preservation, and transportation process**

- **Scope :**
the product control divisions, production divisions, preservation and transportation divisions of Products marketed by Ajinomoto group companies

Informing the Consumer

Real Risks and Perceived Risks



Food Safety Fears by Consumers

Food Safety Commission, 2006

Informing the Consumer

A Company Perspective

- Information through Ajinomoto Web Site
 - Explanatory material on Food Safety Issues by prominent Scientists
 - Country of origin or ingredients listed

- Information on Package
 - Extensive allergy information
 - Explanation for use of certain ingredients
 - Factory location

Frozen Dumplings

Made by Ajinomoto Frozen Foods Co., Inc. in Japan

Kanto Plant (Gunma Prefecture)

Chubu Plant (Gifu Prefecture)

Kyushu Plant (Saga Prefecture)



Additional Information on the Label

Producing Plant Name

Individual ID Number

Allergen Information List

Explanations for Certain Ingredients



Country of Origin of Ingredients

Main ingredients for frozen foods disclosed via internet.

From <http://www.ffa.ajinomoto.com/>

Main Ingredients	Country of Origin
Pork	Canada, USA, Japan
Chicken	USA, Brazil
Cabbage	Japan, China
Onion	China, USA, Japan, Australia
Leek	China
Garlick	China



Risk Communication by Website

1st Food additives Dr. Hideaki Karaki

President of Kurashiki University of Science and the
Arts Chairperson of Expert Committee on Feed and
Fertilizers, etc. of Food Safety Commission



Chapter 4 All are poisons if in excess.

Codex Alimentarius

廣氏

New!



Food allergy

今井 孝成 氏



Food poisoning

賢司 氏



Agricultural chemicals



Risk assessment

山崎 洋 氏



Food additives

唐木 英明 氏

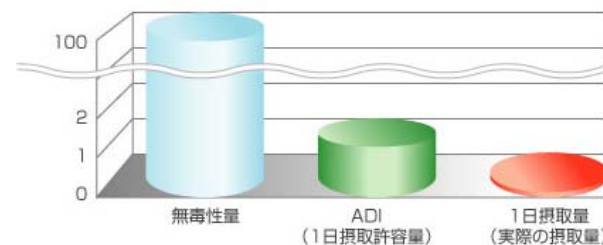


食品添加物の安全は量で決まる



食品の安全を守るためには、食品添加物の量が重要になってきます。例のひとつとして、私たちが毎日、調味料として使っている塩をみていきましょう。極端なたとえば、一度に200グラム以上の塩を摂取すると死んでしまいます。また、みなさんもよくご存じのように、毎日、10～20グラムの塩を食べ続ければ脳溢血(のういつけつ)や心臓病のリスクが増えてしまいます。すると塩は毒か? というところ、そうではありません。一日に7グラム以下であれば、一生のあいだ毎日食べ続けてもなんの害もありません。どんな食品でもたくさんとれば毒ですが、量が少なければ何の悪影響もない。その摂取する量で安全か、どうかが決まります。

では、安全な量は、どのように決めているのでしょうか。食の安全の世界では、まず「無毒性量」というものを決めます。添加物を使う量をどんどん少なくしていくと、何の毒性もないところに行きつきます。ラットやマウスなどを使った何種類かの実験を通して、何の害もない安全な量を決めます。これが無毒性量です。そして、この無毒性量の1/100の量を「一日摂取許容量(ADI)」として、人間が一日に安全に使える量として定めています。これは一生、毎日食べ続けても健康に影響のない量で、食品添加物のほか、残留農薬の基準値にもなっています。



ソルビン酸で計算してみると



ハム
625g
(スライスハム60枚程度)

ソルビン酸を使用基準の上限まで使用したハムを、体重50kgの人が食べる場合、ADI(一日摂取許容量)は625gのハムに相当します。



さらに、無毒性量はADIの100倍になるので、62.5kgのハムに相当します。

Commentary by external experts

Ajinomoto Frozen Foods Website

Introducing International Employees



農薬は、
日本で使用が認められているものしか
使いません。

中国 福建省廈門
農場作業員
張 秀春(ジャンシュウチュン)

自社管理農場で農薬を使用する場合、農場の担当者、品質
管理責任者、農業コンサルタントが日本で許可された農薬の中
から薬品を選び、いつ、どれくらいまくかを決めます。そして、農薬
管理者が決められた分を農場の担当者に手渡しして出入庫の記
録を残します。その後、農薬撒布を担当する私の手元に農薬が
届きます。何段階ものプロセスを経て届いた農薬をもうなく効果
的にまいていきます。

わたしが、味の素冷凍食品です。



毎日2時間、畑をグルグル見回って、
にらなど野菜の生育状況や病気、害虫を
チェックしています。

中国 福建省廈門
農場植保員
劉 祥飛(リウウ シャンフェイ)

私はにら畑など自社管理農場の管理を担
一日2時間、畑をグルグル歩き生育状況が
つかやすい野菜です。害虫をいち早く発
見し、使用を効果的により少なくすることができま

Movie



Photo



残留農薬検査は、
日本の味の素冷凍食品と同じ
厳しい基準で実施しています。

中国 福建省廈門
残留農薬検査責任者
叶 麗貞(イエ リーチェン)

枝豆の残留農薬検査は私が担当しています。検査は収穫前、
加工中、出荷品ができてからの3回のタイミングで実施しま
す。枝豆は検査の前には、たんぱく質や油脂などの余分な成
分を取り除く作業を繰り返します。その後、機械にかけて残留農
薬を検査。日本の味の素冷凍食品の基準はとて厳しく、マニ
アルに従って慎重に行います。

Movie



Photo



To Ensure Food Safety

□ Companies

- Quality Management System
- Education on Quality for all People Involved
- Establishing Trust in the Supply Chain

□ Governments

- Enforcing Quality Management (GMP etc..)
- Risk Communication

□ International

- Capacity Building
- Review of International Specifications
- Exchange of Information on Quality

Thank you very much for your attention
