



Increasing Concerns For Food Safety in A Globalized World



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< Introduction >

Honorable Chairman Mr. Yahudah Paz, and Secretary Madame Gabriella Sozanski, Ladies and Gentlemen !

As the First speaker of this Forum, I am very pleased to have a great opportunity to present my paper – “Increasing Concerns For Food Safety in A Globalized World”. My name is Choi, Chan-Ho, working for the National Agricultural Cooperative Federation in the Research Department.

Food safety, in fact, is the last long and endless concerns for the health and sustainability of all human-beings. Therefore undoubtedly this topic that I am presenting should be one of the most fundamental and central issue for the cooperatives because we, cooperatives are the business operators and major player in the food system over the world. In this sense, I feel a certain responsibility to raise some global issues of concurrent.

Widespread of Public Fears and Concerns over Foods

< **Domestic /international news about food safety relates** >

- Widespread of **pesticide residues** (vegetables, fruits, grain)
- Numerous outbreaks of **food-borne illnesses** due to microbial contamination of foods
- **Dioxin** scare (meats), the effects of **lead** in food on the nervous system.
- Fears over Bovine Spongiform Encephalopathy (**BSE**) - "Mad Cow Disease"
- Appearance in human food of a **GM maize** ("starlink e.g.) approved only for animal feeding

There have been a wide spread of public fears and concerns over foods. The news spread fast in a globalized world.

These are the major fears of the people in taking foods - pesticide residues in foods and in environment, food borne illnesses traditionally, dioxin scares, mad cow disease and genetically modified foods in recent years.

Those are the well-known cases that we met

Pesticide Residues in Foods and Environment

- ❑ Chemical pesticide has been used widely for several decades in plant protection, especially during the period of 'Green Revolution'.
- ❑ Consumers' fears and concerns about pesticide residues grow fast in line with increasing awareness in the hazardous effects on human health and environment.
- ❑ More recently, global concerns over environmental contamination are rising dramatically.
 - Persistent Organic Pollutants (POPs), Endocrine Disrupting Chemicals (EDs), biocides and the likes.
 - More than 3,300 pesticides are listed in the FAO Codex.
 - Including pesticides, about 100,000 chemicals in the market, and 1,000 new chemicals are developed in a year.

Chemical pesticide has been used widely for several decades in plant protection, especially during the period of 'Green Revolution'.

Consumers' fears and concerns about pesticide residues grow fast in line with increasing awareness in the hazardous effects on human health and environment. Some advanced detection technology make institutions and people to know the pesticide residue quickly, especially residues in vegetables and fruits.

More recently, global concerns over environmental contamination are rising dramatically, especially about the Persistent Organic Pollutants (POPs), Endocrine Disrupting Chemicals (EDs), biocides.

Would you believe that about one thousand of new chemicals are being developed in a year.

Table 1. **Pesticide residues**, analyzed in vegetable and fruits in some selected European Countries (1996)

Country	Population (million)	No. of samples analyzed	% with residue	% above MRL
Belgium	10.2	932	52	1
Denmark	5.3	1,273	23	1
Germany	83.5	4,275	33	-
Italy	57.3	7,194	33	1
Netherlands	15.6	11,015	47	-
Spain	39.2	3,022	39	0.1
Sweden	8.9	8,908	39	2
U. K	58.5	878	34	< 1

MRL: Maximum Residue Limit

Source: Byung-Youl Oh, "Pesticide Residues For Food Safety and Environment Protection", International Seminar on Food Safety and Quarantine Inspection, Oct. 21, 2000, Suwon, Korea

As you see in the table, the percent of having pesticide residue in the test sample ranged from 50 to 30 percents, which means that out of 100 vegetables or fruits that you have eaten, 30 to 50 cases had pesticide residues, although the most cases were lower than the Maximum Residue Limit in the European countries. What we worry about is the bio-accumulation of toxicity in our body that can be transferred to next generation.

Food borne illness

Major Bacterial pathogens: *Escherichia coli* (O157:H7),
Salmonella (over 2300 types), *Shigella* (over 30 types)

- The Centers for Disease Control and Prevention (CDC),
USA -

*“ While the food supply in the United States is
one of the safest in the world,
CDC estimates that 76 million people get sick,
more than 300,000 are hospitalized, and*

*5,000 Americans die each year from foodborne
illness. Preventing foodborne illness and death
remains a major public health challenge “*

(<http://www.cdc.gov/foodsafety/>)

According to **The Centers for Disease Control and Prevention (CDC) of USA** – *each year, 76 million people get sick, more than 300,000 are hospitalized, and 5,000 Americans die from foodborne illness.*

***Escherichia coli** (O157:H7), **Salmonella** and **Shigella** are the major bacterial pathogens.*

Bovine Spongiform Encephalopathy (BSE)

"Mad Cow Disease"

- first diagnosed in 1986 in Great Britain
- about 95 percent of cases have occurred in the United Kingdom
- disease confirmed in native-born cattle in other European countries such as Belgium, France, Germany, Spain, and Switzerland
- not known to exist in the United States.

([www.fda.gov/oc/opacom/hot topics/](http://www.fda.gov/oc/opacom/hot_topics/) - UDSA – FDA)

You might have heard the fears in the news about the ‘mad cow diseases’ – Bovine Spongiform Encephalopathy. Although the real out breaking cases are rare, the possibility itself makes people be terrified, because almost everybody eat beef regularly.

Safety Concerns about the GM Foods

*“Genetically Engineered Foods are Different.
It is not same as conventional foods“*

(Consumers International - www.consumersinternational.org)

☐ Allergens

- In 1996, a soybean into which Pioneer Seeds had moved Brazil nut genes in order to improve the soy's protein content was shown to cause allergic reactions in people allergic to Brazil nuts.
- Such severe IGE-mediated food allergies are estimated to affect 2% of adults and 8% of children in the United States, and in the worse case can be fatal.

☐ Toxins

- Many living things, especially plants, contain natural toxins—the leaves of potatoes and tomatoes for example.
- Engineered foods must be evaluated for any unexpected changes

Concerns over genetically modified (or engineered) foods are soaring up.

In the public and international debates about its safeness on human body, the Consumer International which is one of influential NGO internationally, said that “GE foods are different from the conventional foods”.

What the sentence means is that GE foods looks like ordinary foods but may have some possible bad effects:

Those are food allergies, toxicity, nutritional deficiencies in the foods.

However because the US safety review program is voluntary, and does not prohibit introduction of products with allergen hazards, consumers cannot be assured that all such problems will be avoided in the future. Meanwhile there are many countries in which research is underway on genetic transformations that have no regulatory system at all.

❑ Nutritional Changes

- A recent study in the US found that one variety of genetically engineered soy had less of a heart-protective phyto-estrogen than its unengineered counterpart.
- Changes like this can be small or large, and may be trivial or significant in their impact.

❑ Antibiotic Resistance Marker Genes

- Genes for antibiotic resistance are used as markers so researchers can know whether new genes have been taken up in the recipient plant.
- Experiments in the laboratory suggest that such genes could be taken up by bacteria in nature or even in the human digestive tract.

❑ Environmental Concerns

- The terminator technology is particularly problematic, in that it could lead not just to environmental problems,
- but also to monopolistic practices in food production.

And antibiotic resistance maker genes and other potential negative effects on environment.

❑ Ethical and Value Issues

- If you are a vegetarian, for example, you may not want to eat plants that have been transformed to include animal genes.
- A Dutch company recently proposed to open a facility in the state of Virginia in the United States to raise cows engineered with human genes to produce milk that was more like human breast milk.

❑ Concerns of Developing Countries

- Developing countries in Asia, Latin America and Africa have serious doubts about whether GM technology will help with food security.
- They also have grave concerns about patenting of life forms, which they see as having the potential to rob them of the rights to the genetic diversity, which exists in their countries.

Further, the Consumer International argued about the ethical and values issues in taking the GM foods.

Although it is not directly related to food concerns, they criticized the WTO rules on the Trade Related Intellectual Property Rights that can allow transnational companies to take the patent right on the genetic resources of developing countries, and also of life forms.

Table 2. Increasing Acreage of GM crops (1,000 ha.)

Year	Total	U.S.A.	Argentina	Canada	The rest
1996	1,600				
1997	11,000	8,100	1,400	1,300	200
1998	27,800	20,500	4,300	2,800	200
1999	39,900	28,700	6,700	4,000	500
2000	43,000	30,300	8,800	3,000	900
(Share)		(70 %)	(21%)	(7%)	(2%)

- the Rest: China, South Africa, Mexico, Spain, Portugal

⇒By crops (in 2000) : Soybean (24,500), Corn (9,400), Cotton (5,300), Oilseeds (2,800) Potatoes (150), pumpkin, papaya, sugar beet, rice, wheat, tobacco, tomato, carnation, and others (1,000)

As shown in the table 2, the acreage of GM crops over the world is increasing rapidly by years. The United States still shares a large portion (70%) but the acreage increases of other countries will be dramatic, considering the fact that most of developing countries including China started to absorb the GM (or bio-technology) technology from the fronting countries. As they say, since the technology is still in the front-page, and seems has no limit in application, variety of GM crops will also be increased rapidly.

In Korea, commercialized GM crop is not available yet.

Rural Development Administration (RDA), the government research agency are developing 13 crops of GM in 34 species under developing.

*"In a globalized world,
we all swim in a single
microbial sea."*

- WHO Director-General Dr. Gro Harlem Brundtland
in her opening speech at the [Codex Alimentarius
Commission meeting](#) in Geneva (2-7 July 2001).

In discussing this issue on food safety concurrently, I agree with this statement made by the WHO Director General last July in Geneva.

In a globalized World, we all swim in a single microbial sea. Really we are in a same boat so far we all eat same food. In a globalized world, mass production, mass shipping, mass processing and mass consumption is the on-going trend.

Factors Affecting the Food Safety Concerns

- **Technology advancement**
 - **In agricultural production**
 - pesticides, veterinary medicines, artificial feeds, soil pollutants
 - Post-harvest treatments (chemicals, freezing) in marketing
 - Genetically Modified (GM) crops
 - **In processing, packing and delivery**
 - food additives, packing materials, irradiation
-
- **Capital intensification in agriculture**
 - More uses of the techs, monoculture, mass production methods
 - **Industrial concentration in the agro-food sector**
 - Horizontal and vertical integration – from seeds, pesticide to food retailing
 - Extended food chains – more people and control points
 - **Trade explosion, disputes, and harmonization of the regulations**
 - SPS agreement of WTO, FAO Codex Alimentarius, TRIPs



Let me illustrate some factors that accelerating our food safety concerns. First of all, the technology advancement in agricultural production and in processing, packing and delivery. When a new technology comes from laboratory, it has been usual in the history that commercials were eager to apply in an earlier time. This tendency is risky for the food safeness. I think, capital intensification leads more uses of the new technology outputs such as new chemicals, new packing materials and new radiation technology. In recent of globalized world, industrial concentration by few numbered multinational corporations is accelerating, which in turn makes consumers' food safety concerns more dark-colored. They don't know exactly who produced in where and in what circumstances. A lengthy food chain make our food safety more vulnerable. International standards such as FAO Codex also determines our food safety in the era of open trade system.

Technology Advancement

- **In Production**
 - Mechanization – mass production
 - Control environment – chemicals, green house
 - Postharvest technology – keep freshness
 - Gene modification (biotechnology) – yield, resistances
- **In Processing**
 - Industrialization of the traditional foods
 - Creation of new foods
 - Uses of various food technologies and food chemicals

About 100,000 chemicals in the market, and
1,000 new chemicals are developed in a year.

Capital Intensification in Agriculture

- “Large farms exist because of a trend that started with the advancement of world markets.
 - World commodity prices are desperately low. Today Canadian and the US farmers are facing the lowest prices for commodities than in the 1930’s. In Iowa farmers’ profits dropped from 35% in 1950 to 9% today.
- In order to reach incomes adequate to live on, farmers have had to increase the size of their farms and intensify the farming practices.
- **Agricultural intensification** – using more chemicals and fertilizers, and growing genetically modified seed – is an attempt to increase profit any way possible.”

(Dwayne Pattison, “An International Farm Crisis”, unpolished, paper, ICAO, Seoul Korea, July 2001)

Industrial Concentration in the Agri-food Sector - 1 -

- The International Federation of Agricultural Producers -
Third draft report on "INDUSTRIAL CONCENTRATION
IN THE AGRI-FOOD SECTOR", July 2001 >

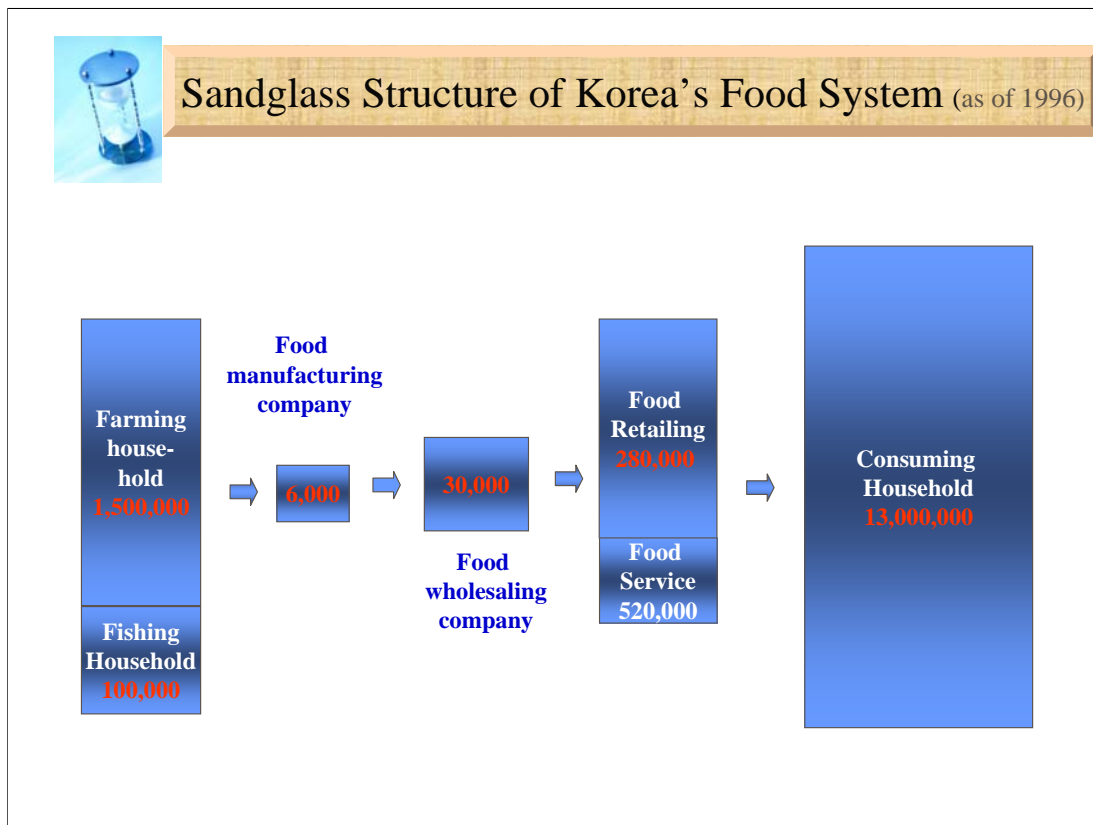
□ On-going trend of vertical integrations

- ✓ On the agri-business side, three large clusters of transactional companies – **Cargill/Monsanto**, **Novartis/ADM/IBP**, and **ConAgra**, dominate the sector.
- ✓ These clusters link up biotechnology companies, grain trading and processing companies, and meat production and processing companies.
- ✓ The food processing sector is dominated by three large global companies - **Nestle**, **Unilever**, and **Philip Morris**.
- ✓ At the food retailing end, four companies dominate global markets - **Tesco** (UK), **Ahold** (Netherlands), **Carrefour** (France), and **Wal-Mart** (USA).

Industrial Concentration in the Agro-food Sector -2-

- ❑ **The primary effect of concentration and strategic alliances**
 - ✓ an increase in the level of power held by firms over farmers worldwide.
 - ✓ Regardless of the location of a given farmer, with less firms buying their product and supplying their inputs, farmers have less choice about what and how to produce.
 - ✓ Distribution and retail firms are beginning to control larger and larger markets, and are able to control more and more of the consumer dollar and food safety.

According to the booklet produced by the Christian-Aid, which is one of the most critical NGO for the GMO issues in the U.K, quoted a statement made by a Monsanto Executive (98); "What you are seeing is not just a consolidation of seed companies, it is really the consolidation of the entire food chain". So, it seems that the worries of the civil groups on the business concentration of the transnational corporations would be real.



If we try to analyze the concurrent situation of the food system in a certain country, we can see the structure looks like a sandglass watch.

One side in production in the country's food system, there are numerous numbers of farmers.

And the other side, there are also countless individual consumers.

But in the middle of the food chain, few numbered companies control the both production and distribution.

In Korea, as you see in this slide, you can see the trend of the concentrations.

In terms of the food safety concerns, an outbreak of massive hazards is possible in case wrong decision is made by a small numbered profit oriented gamblers.

Even in case they are honest and innocent, unintended small mistake can make a sudden big problems over the country.

Trade Explosion, Increasing Disputes, and Harmonization of the Regulations

- **The Codex Alimentarius Commission :**
is the highest international body on food quality and safety standards. The Commission is a subsidiary body of **FAO and WHO**. It has currently 165 member countries.
- **Sanitary and Phytosanitary Agreement (SPS):** contains WTO rules on food safety, inspection and labeling, and animal and plant health (e.g., quarantines, invasive species countermeasures.)



Where agricultural and food trade has increased rapidly, cases of bilateral trade disputes between and among countries has soared up. The Codex Alimentarius of the FAO and WHO joint work has served as an international standard in the disputes. At this circumstance, the Codex standard become more central in our food safety concerns.

Issues and Debates - around the food safety policies -

- Harmonization of the countries' regulations with the FAO Codex

Table 3. Comparison of carbaryl **MRL** in some foods among selected countries (unit: mg/Kg)

Country	Rice	Wheat	Apple	Grape	Lettuce	Strawberry
FAO Codex	5	5	7	5	10	7
U.S.A	5	3	10	10	10	10
Canada	2	2	10	5	10	7
Japan	1	-	1	1	-	-
Korea	1	3	0.5	0.5	1	0.5

Source: Byung-Youl Oh (2000)

But see in this table, the safety checking level of Codex is usually lower than of the individual countries. In the process of harmonizing the different level of regulations, lower international standard will be the outcome inevitably.

Critics from NGOs *about - the WTO rules affecting the food safety standards and public health*

Harmonization: *is the replacement of varied national standards with uniform global standards to facilitate trade.*

The WTO requires or promotes harmonization of food, product safety, environmental and other standards. Harmonization undermines the value choices that people in different societies make about the standards by which they want to live.

Codex Alimentarius Commission: *is the industry-influenced international body that the WTO recognizes as setting the presumptively WTO-legal food standards.*

(Whose Trade Organization? (p.52), Public Citizen,
Washington D.C. USA, 1999: www.citizen.org)

To this lowering process of the international harmonization of the countries' regulations, many NGOs criticized.

Illustrated cases that the WTO rules undermined
the countries' needs in food safety and environment :

EU Artificial Hormone Residues in **Beef**

Company-Inspected **Australian Meat** Declared Equivalent to U.S.
Government Inspection

Australian Quarantine on Raw **Salmon**

Japan **Codling Moth** Testing

South Korean Shelf Life for **Meat**

South Korean Produce Inspection

EU Toxic **Teething Ring** Ban

Danish **Lead** Ban

(Whose Trade Organization? (p.52), Public Citizen,
Washington D.C. USA, 1999: www.citizen.org)

Illustrated cases that the WTO rules undermined the countries' needs in food safety and environment :

EU Artificial Hormone Residues in Beef: The WTO ruled against a ban on beef containing artificial hormone residues because the EU could not prove scientifically that *residues* in meat harm human health (the actual hormones are known to do so.) The WTO approved \$ 116.8 million in sanctions after the EU refused to cave in and accept the meat

Company-Inspected Australian Meat Declared Equivalent to U.S. Government Inspection: Applying WTO rules, the U.S. deemed Australian company-inspected meat to be "equivalent" to U.S. government-inspected meat. Both products will bear the same U.S. Department of Agriculture seal of approval although a dramatic rise in salmonella cases paralleled the implementation of the new system.

Australian Quarantine on Raw Salmon: The WTO ruled against Australia's strict rules governing importation of uncooked salmon, designed to prevent foreign bacteria from infecting domestic salmon stocks. Australia scientifically proved risk, but not the precise probability that it would occur, thus failing the WTO's prohibitive evidentiary rules.

Japan Codling Moth Testing: Japan is free of the agriculturally devastating codling moth. The WTO ruled that Japan could not invoke strict testing requirements on all fruit based on experience with one type of fruit *unless* it could prove scientifically that such tests were necessary for all fruit.

South Korean Shelf Life for Meat: To avoid a U.S. WTO challenge on its 30-day shelf life limit for meat, South Korea weakened its food safety policy by extending shelf life to 90 days.

South Korean Produce Inspection: To avoid a U.S. WTO challenge, South Korea agreed to dramatically shorten the duration of its produce inspection process. Now produce is sold to consumers before test results on its safety are in.

EU Toxic Teething Ring Ban: The U.S. threatened WTO action on behalf of the toy industry against an EU-wide policy regulating certain plastic softeners used in teething rings and other toys. This was a unique instance in which a WTO threat backfired, thanks to joint efforts of the European governments and U.S. consumer groups.

Danish Lead Ban: The U.S. has threatened a WTO challenge if Denmark implements an intended ban on lead compounds in pigmeats and chemical processes to avoid lead's threat to child development.

Views and Different Interests on **GMO**

□ **USDA**

“Biotechnology has the potential to make agriculture more productive. ... Scientists believe that biotech has the potential to increase crop yields by 20% or more with no greater use of natural resources, even on small farms.”

*The overwhelming majority of scientific experts worldwide – both private and public – based on years of research, believe that biotech foods are safe for people to eat. In fact, all evidence that we have indicates that **biotech foods are as safe as conventional foods, even those foods that have been around for hundreds of years.***

This promising beginning has been marred already by Europe’s refusal to permit imports of biotech corn varieties approved by competent European authorities. As a result, American corn producers are now losing some \$200 million in legitimate exports annually.

< Alan P. Larson (Undersecretary, US Department of State), “Biotechnology: Food Security and Safety”, Economic Perspectives USDA Electronic Journal Vol.4 No. 4 October 1999 >

You may already know much about the rising international debates and dispute on the matter of GM crop and foods, and the different views and position on it. Therefore, given the time limit, I better skip this part.

❑ **Consumers International** (www.consumersinternational.org)

*"Genetically Engineered Foods are Different.
It is not same as conventional foods"*

"We have repeatedly argued in the Codex Labeling Committee that even were the immediate issues of the safety of GM foods.- both generally and in particular - agreed within **an appropriately comprehensive scientific framework and risk assessment programme, mandatory labelling should be introduced to allow consumers to decide for themselves whether they wish to buy and eat them"**.

❑ **Organic Consumers Association** (www.purefood.org)

The mysterious DNA was found in the Monsanto Company's Roundup Ready soybeans by Belgian government and university scientists, who described their findings in a paper published yesterday in the journal European Food Research and Technology.

Greenpeace called yesterday for countries to re-evaluate the regulatory approvals of the soybeans, saying that Monsanto did not know as much as it should about its product. (The New York Times, August 16, 2001)

❑ **WHO** - Director-General (Dr Gro Harlem Brundtland)

“We need to improve the systems that we use to ensure food safety and re-establish consumer confidence. We must reassess them all the way from the farm to the table.

The Codex Commission needs to ensure that there are clear and useful international guidelines for genetically modified food.”

(at the opening speech at the Codex Alimentarius Commission meeting in Geneva (2-7 July 2001).

❑ **FAO** - Director-General (Jacques Diouf) May 2001)

“Genetically modified organisms (GMOs), like all the new technologies, are instruments that can be used for good and for bad in the same way that they can be either managed to the benefit of the most needy or skewed to the advantage of specific groups,“

(www. fao.org, FAO Press, May 2001)

❑ **IFAP** (International Federation of Agricultural Producers)

- “The potential benefits of the technology are considerable.
- *However, strict precautions must be taken to avoid any adverse effects on human health, the environment and on farmers’ ability to run their operations.”*
- *To build up a consumer confidence in the products placed on the market, we request **labelling of any product containing GMO material.***
- *IFAP recommends that farmers and the food manufacturers bring non-GMO food to the market.*
- *It is essential that **publicly-funded research** increases focus on the potentials of biotechnology. Monopoly is a major threat to agriculture.”*

(Third draft report on "FOOD SAFETY AND QUALITY“, July 2001).

❑ **Codex (FAO-WHO)**

Codex takes some steps to tighten GM food safety tests

Geneva, 6 July 2001 - - The Codex Alimentarius Commission has taken some initial steps to tightening up the ease with which genetically modified foods are put on the market globally.

(www.twinside.org, sg) – The Third Word Network

Differences in the Regulations on GMO products

- **EU, Japan, Australia, New Zealand (precautionary principle)**
 - Approve imports and marketing after the designed food safety evaluation for the human food, and risk assessment on environment for the seeds.
- **USA (equivalency)**
 - **USDA (Animal and Plant Health Inspection Service)** – field test
 - **EPA** – issue permits for large-scale testing of herbicides and new plants that containing pesticide substances.
 - **FDA** – test foods derived from new plants, food labeling
- **Korea**
 - **Ministry of Ag. and Fisheries** – labeling on soybean, sprout soybean and corn (since March 2001)
 - **Korean FDA** – labeling the derived foods from soybean and corn (27 items)

Precautionary Principle: It calls for action to *avoid* uncertain and possibly irreversible harm. Under the precautionary approach, industry is required to prove a product's long-term safety before it is approved for the market. The WTO puts the responsibility of proof on governments to show scientifically that a risk exists *prior to* taking action and exposes laws based on precaution to successful WTO attack.

Equivalence: Significantly different, often lower, standards from other countries can be declared equivalent to domestic standards based on subjective comparisons without clear procedural guidelines or an enumeration of the factors to consider. Once a standard is declared "equivalent," it must be treated as if it were a domestic standard.

In Japan, GMO-labeling on 24 processed foods derived from soybean, corn, potato, canola. In Korea - unintended degree of GMO inclusion: 3%

Table 4. Consumer concerns of selected countries over food-borne hazards

Hazardous factors	USA (1997) N=1,011	Japan (1998) N=1,004	Korea (1998) N=299
Microbial contamination	77	49	51
Pesticide residue	66	80	50
Food additives & preservation	20	52	40
Anti-biotic and hormone contamination	42	62	45
Radiated food	29	56	43
GM food	16	8	17
Unsanitary food dealing	-	-	57

Note) N shows the total respective number of people surveyed and other numbers shown in the columns of 2 to 4 indicate the share of the people who answered “yes” when they were asked if they are concerned over the respective hazardous factors.

Source: Lee Chul-Ho, “Public Perceptions on Irradiated Foods”, Report of the Ministry of Science and Technology, 2000

Approaches to ensure the food safety

- ❑ Good Farming Practice → sustainable agriculture
 - Integrated Pest management (IPM),
 - Integrated Nutrient Management (INM)
 - Developing the FAO code (verification, certification, monitoring)
- ❑ Develop and adoption of sound-scienced technology
 - Hazard Analysis and Critical Control Point (HACCP)
- ❑ Minimize the length of the food chain
 - Direct selling (producer to consumer)
- ❑ Differentiate the GM products in the food chain
 - Mandatory labeling
- ❑ Establish a stricter regulation, based on the sound science
 - Public-funded research and information distribution
- ❑ Promoting global dialogues
 - Capacity building of civil societies and the developing world



Sustainable agriculture is the everyone's responsibility. Recently we recognized the needs to assist farmers to move (gradually) from the high- and low-input extremes of current practice to the more-sustainable centre ground. The strategy also should seek to educate consumers how they can fulfil their environmental responsibility by discriminating between food and fibre products, not just on the basis of cost and quality, but also on production methods and their social and environmental consequences.

HACCP was developed in the United States, basically to control the hazards from microbial contamination. But recently there also is increasing public health concern about chemical contamination of food: for example, the effects of lead in food on the nervous system. Therefore further research development and implementation should be sought by the related agencies and in the international arena two.

7 Basic HACCP Implementation Principles

Hazard Analysis and Critical Control Point

1. Analysis Hazard

2. Identify Critical Control Points (CCPs)

3. Establish Critical Limits

4. Establish Monitoring Procedures

5. Establish Corrective Actions

6. Establish Verification Procedures

7. Establish Record Keeping/Documentation



The scheme of **Hazard Analysis and Critical Control Point**, or HACCP (pronounced hassip), was developed by the USA-FDA nearly 30 years ago for astronauts and is applying it to seafood. The agency intends to eventually use it for much of the U.S. food supply. The program for the astronauts focuses on preventing hazards that could cause food-borne illnesses by applying science-based controls, from raw material to finished products.

HACCP involves seven principles:

1. Analyze hazards. Potential hazards associated with a food and measures to control those hazards are identified. The hazard could be biological, such as a microbe; chemical, such as a toxin; or physical, such as ground glass or metal fragments.

2. Identify critical control points. These are points in a food's production--from its raw state through processing and shipping to consumption by the consumer--at which the potential hazard can be controlled or eliminated. Examples are cooking, cooling, packaging, and metal detection.

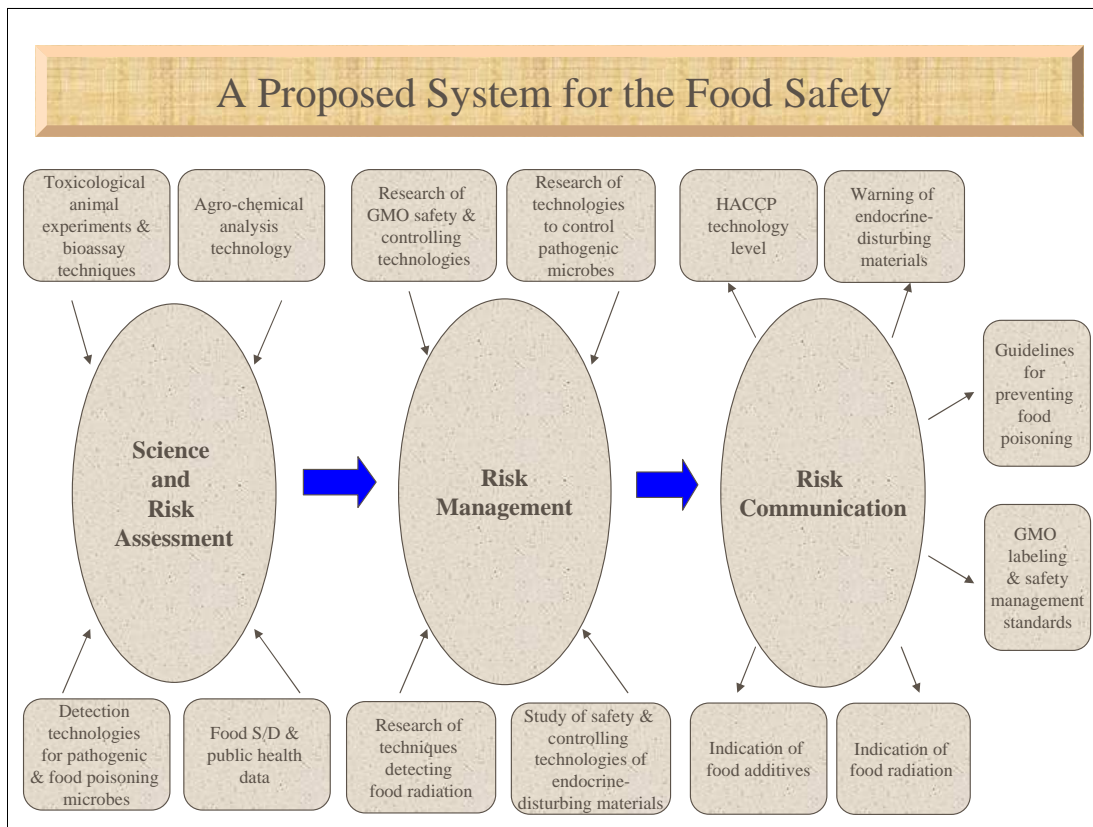
3. Establish preventive measures with critical limits for each control point. For a cooked food, for example, this might include setting the minimum cooking temperature and time required to ensure the elimination of any harmful microbes.

4. Establish procedures to monitor the critical control points. Such procedures might include determining how and by whom cooking time and temperature should be monitored.

5. Establish corrective actions to be taken when monitoring shows that a critical limit has not been met--for example, reprocessing or disposing of food if the minimum cooking temperature is not met.

6. Establish procedures to verify that the system is working properly--for example, testing time-and-temperature recording devices to verify that a cooking unit is working properly.

7. Establish effective recordkeeping to document the HACCP system. This would include records of hazards and their control methods, the monitoring of safety requirements and action taken to correct potential problems. Each of these principles must be backed by sound scientific knowledge: for example, published microbiological studies on time and temperature factors for controlling food-borne pathogens.



Pesticides – regulated in Korea

(by the Korean Food and Drug Administration)

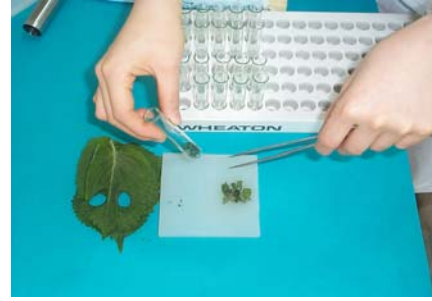
□ **1st Priority (135)** 2nd. priority (135) 3rd priority (64) 4th priority (90)

nitrapyrin, diazinon, deltamethrin, DDT(+DDD,DDE), dinocap, dimethoate, disulfoton, diuron, *dicofol*, dichlofluanid, dicloran, diclofop-methyl, diphenylamine, diphenamid, myclobutanil, malathion, mevinphos, methomyl, methiocarb, mecarbam, metalaxyl, metolachlor, metobromuron, methoxychlor, metribuzin, methidathion, vamidothion, bendiocarb, bromacil, BHC, bifenthrin, vinclozolin, simazine, cypermethrin, cyfluthrin, cyhalothrin, acetochlor, azinphos-methyl, aldrin & dieldrin, aldicarb, alachlor, edifenphos, ethiofencarb, ethion, ethalfluralin, ethoprophos, etrimphos, endosulfan, endrin, omethoate, oxadiazon, oxadixyl, oxamyl, oxyfluorfen, imazalil, isofenphos, isoprocarb, iprodione, EPN, bromopropylate, chinomethionat, thiometon, carbaryl, carbophenothion, carboxin, captafol, captan, quintozone, chlorobenzylate, chlorothalonil, chlorfenvinphos, chlorpyrifos, chlorpyrifos-methyl, terbutryn, terbufos, tetradifon, tolyfluanid, tolclufos-methyl, tralomethrin, triadimenol, triadimefon, triazophos, trifluralin, triflumizole, thiodicarb, thiobencarb, parathion, parathion-methyl, paclobutrazol, permethrin, fenarimol, fenamiphos, fenitrothion, pendimethalin, fenvalerate, fenbuconazole, fenthion, penconazole, phenthoate, fenpropathrin, phosalone, phosmet, phosphamidon, phoxim, folpet, flusilazole, fluvalinate, prometryn, procymidone, prochloraz, propanil, profenofos, propoxur, pyrazophos, pirimicarb, pirimiphos-methyl, pirimiphos-ethyl, hexaconazole, heptachlor, chlordane, cadusafos Isoprothiolane, Iprobenfos, Chlorfenapyr, Tebufenozide, Tebufenpyrad, Teflubenzuron, Fenazaquin, Prothiofos, Flufenoxuron, Pyraclofos, Pyridaben, Fipronil, Fenobucarb (All numbers = 424)

Uses of the Rapid Bioassay Pesticide Residue (RBPR) Detection Technology in Korea



NACF adopted the **RBPR** from Taiwan (TARI) in 1997, and there are 229 test stations nationwide.



Sampling test **before auction** in the markets
The % of over MRL is 1.39.



Detection-enzyme is extracted from eyes of the **raised house-fly**



The cost of one sampling test is
US\$ 12 cents

Korea's pilot HACCP project implementation

Product group	Item	No. of factories conducting HACCP system	Period of pilot project implementation
Processed meat	Ham, sausage	4	Oct 95 to Aug 96
Processed fishmeals	Boiled fish pastes	10	Jul 96 to Jun 97
Frozen fish products	Fish, mollusk, shellfish, crustacean, etc.	6	Aug 97 to Nov 97
Milk and dairy products	Milk, fermented milk, natural and processed cheeses	33	Sept 97 to May 98
Frozen food products	Other breads, noodles, other processed food, etc.	5	Dec 98 to Apr 99
Ice cream	Ice cream	10	Dec 98 to Apr 99

Thank You for your attention !
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