Annual Report 2011

Animal, Plant and Fisheries Quarantine and Inspection Agency

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Quarantine and Inspection Agency

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Moving forward to become a global quarantine and inspection agency trusted by the public and recognized by the world

In June 2011, the Animal, Plant and Fisheries Quarantine and Inspection Agency (QIA) was established as a single national institution in charge of the quarantine and inspection of agro-fishery and livestock products. One year after its launch, QIA still strives to move forward by creating synergy through intra-organizational harmony.

In the midst of change, our agency has published this Annual Report 2011 in order to reflect on the achievements in 2011 and seek further development in the coming years.

In 2011, in the face of difficulties in the process of integration, QIA successfully established a rapid response system for major animal disease outbreaks, improved the border quarantine and control system, secured the safety of domestic and foreign livestock and fishery products following the nuclear disaster in Japan, strengthened the safety control of veterinary medicine, achieved $100 million export target and laid the foundation for the advancement of animal protection through the complete revision of the Animal Protection Law. Furthermore, we also revised the Plant Protection Act in an attempt to set up a surveillance and control center for the effective implementation of surveillance and control measures against exotic pests, established the International Plant-quarantine Accreditation Board in February 2012, strengthened support and international cooperation to further increase export of agro-fishery products and applied research results to various fields including policy suggestions, patent application and paper publication through research projects in the veterinary science and plant quarantine technology.

To become a publicly trusted and globally recognized agency, QIA will strive to establish a clear and rapid response manual to major animal diseases, especially in preparation for FMD and AI outbreaks. We will also work to strengthen food safety control, improve the border quarantine system and establish a comprehensive export support system. And finally, in preparation for FTAs and climate change, we will make efforts to enhance national competitiveness by finding ways to eradicate zoonoses and securing advanced technologies and also to make coordinated efforts within and outside the country, such as the establishment of a cooperative system in response to major animal diseases and climate change in the Asian region.

This Annual Report 2011 demonstrates the progress by task, composed of nine chapters: (1) Import and export quarantine and inspection of animal, plant and fishery products, (2) Control and prevention of animal disease, (3) Surveillance and control of exotic plant pests and import risk analysis, (4) Sanitary management and safety inspection of livestock products, (5) Country of origin labeling and quality control of fishery products & safety control of domestic fishery products, (6) Quality control and safety management of veterinary medicinal products, (7) Animal protection and welfare, (8) Research and development of veterinary science and plant quarantine technology and (9) IT Information business and scientific information services. I hope this report will contribute to better understanding and development of the veterinary field.

Finally, we are deeply grateful to people from producer and consumer organizations and the academic community for their cooperation and support for various projects led by QIA last year.

November, 2012
QIA Commissioner

01

Import/Export Quarantine and Inspection of Animal, Plant and Fishery Products (Including Salt)

Animal & Livestock Products Quarantine
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3. 2011 Import/Export Quarantine Results of Animal, Plant, and Fishery Products

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1. Introduction
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1. Introduction
2. Inspection Status of Domestic/Imported Salt

Animal & Livestock Products Quarantine

1. Introduction

To prevent the introduction of foreign animal diseases and harmful livestock products into Korea through importation and ensure that these products are imported from animal disease-free countries, we are designating import prohibited regions for animals and livestock products, in accordance with the Act on the Prevention of Contagious Animal Disease and the Livestock Product Sanitary Management Act, and requiring import permitted countries to comply with the import sanitation requirements. Also, when these animals and livestock products enter our country, we are performing epidemiological survey, real product inspection and disinfection to determine whether they are from prohibited regions and whether they comply with the import sanitation requirements, along with laboratory tests on animals disease, component specifications and residues in livestock products to reconfirm safety before entry to our country.

The animals and livestock products imported to Korea through normal trade routes can be easily controlled through laboratory tests and import prohibition in case of hazards, but undeclared products illegally brought in by international travelers cannot be controlled, and thus can be the source of foreign animal disease and/or zoonoses. In particular, recent globalization and trade liberalization have led to more than 20 million international travelers entering Korea every year through airports only and 56,000 of them are livestock industry officials who visit the countries with animal disease outbreaks. There has been a constant cause of concern for animal disease, with increasing international trade and travel every year, including the continuing entry of livestock products and international parcels from disease risk countries.

In response, the Korean Ministry for Food, Agriculture, Forestry, and Fisheries (MIFAFF) and the Animal, Plant and Fisheries Quarantine and Inspection Agency (QIA) have jointly established special quarantine measures following the “regular control system for AI and FMD” and the “special control measures for AI and FMD (Oct/May),” to raise public awareness of border quarantine, control each route of introduction through systematic cooperation with related authorities, and minimize damages through early detection and prevention of risk factors.

2. 2011 Border Quarantine Results

I. Improvement of Border Quarantine in 2011 to Prevent Introduction of Foreign Livestock Epidemics

1) Collection of Global Information to Prevent the Introduction of Foreign Animal Disease

We collect information on the international trends of livestock epidemics and livestock food sanitation on a daily basis via the OIE webpage (about 260 times daily) and post such information on our Intranet, the MIFAFF Knowledge Management System (KMS), and the QIA webpage to swiftly respond to sanitary information trends by prohibiting importation or strengthening quarantine.

2) Mandatory Disclosure of Information on Countries Affected by Animal Disease and Quarantine of Livestock Industry Officials and General Travelers Entering from Such Countries (Jul 2011)

With the enforcement of the Act on the Prevention of Contagious Animal Disease (Jul 25), it has become mandatory to disclose information on countries affected by livestock epidemics and perform quarantine on livestock industry officials and travelers entering from those countries. In response, QIA, MIFAFF, and local governors disclose updated information on animal disease outbreak situation on webpage, newspapers, and magazines, implement “preliminary notice on requirements” and “promotion of border quarantine” for general travelers and livestock industry officials from outbreak countries, and conduct stringent inspection and disinfection.

3) Construction and Operation of “Border Quarantine Control System” for Livestock Farmers Traveling Abroad (Dec 2011)

We require livestock farmers traveling abroad to declare departure/entry at the quarantine services in each airport/port to construct an advanced “border quarantine control system” and prevent reentry of FMD and AI. This system has successfully stabilized as the declaration and disinfection rate of livestock farmers traveling abroad increased from 64.3% in 2010 to 99% in 2011.

4) Improvement of Field Quarantine to Monitor Carryon Items of International Travelers

First, we increased CIQ personnel during the special border quarantine period to effectively conduct onsite quarantine during the busy hours in airport/ports and strengthened border quarantine by implementing regular control system for AI.

Second, we assigned 18 quarantine detector agents and 49 quarantine detector dogs (16 operating dogs) for 37 routes from 18 FMD or AI risk countries and exposed 35.5% of the total carry-on meat items (18,920 cases, 21 tons). We also deployed 16 detector dogs for more stringent quarantine of parcels and

bulky feeds in Incheon/Gimhae/Jeju International Airports or in the International Parcel Center.

Third, we imposed fines (238 cases) on smugglers of livestock products from animal disease risk countries, such as China and Mongolia, increased penalties on smugglers and raised awareness of animal smuggling.

Table 1. Records on Quarantine of Livestock Products in Carryon Items (Unit: Case, Kg)

Period	Total		Accepted		Unaccepted								Performance of Quarantine Trained Dogs		Imposition of Fines	
					Subtotal		China		Mongolia		Others					
	Cases	Weight	Cases	Weight	Cases	Weight	Cases	Weight	Cases	Weight	Cases	Weight	Cases	Weight	Cases	Weight
2010	58,142	95,354	4,229	5,974	53,913	89,380	33,491	48,513	2,851	4,477	17,571	36,391	18,965	23,826	278	1,359
2011	53,343	94,783	3,989	12,819	49,354	81,965	28,649	41,202	3,745	5,272	16,960	35,491	18,920	21,459	238	1,165

Table 2. Records of Disinfection

Period	Tourist Disinfectant Foot Mat (flight)	Installation of Disinfectant Foot Bath (place/number)				Imported Hay Disinfection Records		Container Disinfection Records (container)	Disinfection of Vehicles from North Korea (car)
		Airport	Trade Port	Others	Total	Cases	Weight (ton)		
2010	246,014	107/470	104/253	64/115	275/838	30	4,383,534	269	114,233
2011	192,590	105/450	100/283	43/67	248/800	34	4,136,588	391	100,379

5) Disinfection for Preventing the Introduction of FMD and AI

We installed disinfectant baths (248 places, 800 baths) at the entry of international airports/ports across the country and implemented disinfection of shoes (193,000 flights) of international travelers. The Incheon International Airport operates 15 daily workers for disinfecting shoes 24/7, replaces aged/ damaged disinfection baths and refills disinfectant for more strict management of shoe disinfectant baths. Also, we disinfected cars entering from North Korea (100,000 cars) to prevent introduction of foreign animal disease, such as FMD, and performed formalin fumigation on 34 cases of bulky feeds imported from countries subject to import sanitation requirements.

6) Improvement of Laboratory Test and Monitoring Inspection of FMD

We performed FMD virus tests (429 cases) on meat, hams, and sausages from countries affected by FMD, such as China, and laboratory tests (34 cases) on all batches of hays imported from countries subject to bulky feed import sanitation requirements to determine whether they are infected with FMDV (all negative).

7) Field Inspection of Airports/Ports and Cooperation with Related Authorities

We assigned 2,190 people to perform field inspection of border quarantine 1,338 times a year at airports/ ports and overland routes to North Korea and visited food waste treatment facilities once a week during special FMD monitoring periods and once a month during regular periods to conduct disinfection, monitor treatment status, and request cooperation (297 times). Also, we improved cooperation by signing MOU with Korea Overseas Tour Conductors Association for border quarantine cooperation (Sep 2011), sharing information with and seeking support for managing livestock-related people from CIQ-related authorities, such as the Ministry of Justice and Korea Customs Service.

8) Preliminary Promotion of Border Quarantine to the Public

We used DID (digital information display), PDP, and LCD at each airport to raise awareness of quarantine services before entry and encourage travelers to make declaration. Also, we used various PR facilities and media, including 80 electronic boards (22 exclusive lines and 58 combined lines) and promotional videos and announcements (86,383 times) on boards and cabins, for announcements on "international travel requirements" (two SMS messages sent to 73,600 livestock industry officials and 6,000 international travel agencies each month), dissemination of promotional videos and cartoons, and multilateral promotion targeting immigrants' broadcasting stations, urban airport terminals, airport buses, and livestock organizations.

Table 3. Border Quarantine Promotion in Airports & Ports

Period	Campaign					Airport and Port Onsite Inspection			Training & Promotion		Cooperation Notices with Related Authorities	Press	Food Waste-related Business Trips	
	Number	People				Number	People	Total	Number	People			Number	People
		Quarantine & Inspection HQ	Customs/ Quarantine Stations	Airline/ agricultural cooperatives	Total									
2010	1,026	5,176	491	4,065	9,732	1,444	2,783	2,090	14,351	85,905	659	23	318	580
2011	1,445	6,001	309	2,103	8,413	1,338	2,190	1,680	43,333	102,071	507	26	297	536

Period	On-board Videos and Announcement	Electronic Display Subtitle Guide	Electronic Boards			Promotion Material Dissemination					
			Exclusive	Combined	Subtotal	Leaflets	Quarantine GuideBooks	AI Information Books	Posters	Flyers	Others (ex: ballpoint pens)
2010	81,279	19,500,439	18	56	74	469,914	28,938	74	2,465	87	262,934
2011	86,383	25,824,544	22	58	80	383,527	7,763	776	1,121	59	164,218

We strengthened quarantine promotion activities by sending quarantine guide books to senders/receivers of rejected parcels, offering training to officers of related authorities and airline workers (43,333 times, 102,071 officers), holding campaigns in airports/ports (1,445 times, 8,413 people), increasing border quarantine promotion staff, and providing training and promotion to group travelers/ overseas livestock event participants.

II. Improvement of Border Quarantine Facilities

We repaired/renovated old quarantine facilities, including the quarantine site in Yeongjon Island (piggery) to improve the work efficiency and promote the advancement of quarantine facilities.

3. 2011 Import/Export Quarantine Results of Animal, Plant, and Fishery Products

I. Quarantine & Inspection Trends

Table 4. Summary of Quarantine and Inspection Record over the Last Five Years (Accepted, Rejected, Field, General Records)

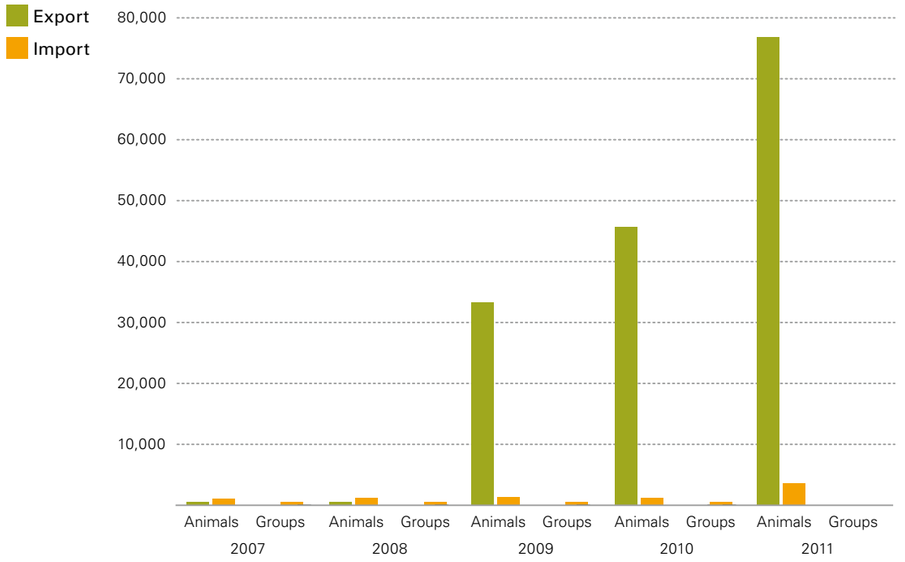
Year	Animal				Livestock products			
	Export		Import		Export		Import	
	Case	Animals/groups	Case	Animals/groups	Case	Quantity (kg, ea)	Case	Quantity (kg, ea)
2007	6,729	255,299	7,608	1,085,087	10,215	144,263,159	126,109	2,025,937,278
	-	-	9	436	118	5,727	293	763,939
2008	6,721	217,523	7,377	1,175,976	11,457	149,795,358	127,597	2,048,974,242
	1	12	2	150	182	692,536	319	663,002
2009	6,956	33,241,930	7,186	1,318,808	12,385	144,041,809	128,761	1,937,033,025
	-	-	1	100	209	1,973,577	367	717,446
2010	7,488	45,734,948	8,320	1,216,782	11,251	146,772,613	144,449	2,125,597,531
	-	-	2	70	139	1,122,198	464	2,823,003
2011	8,488	76,857,815	10,029	3,540,881	12,414	170,492,740	161,164	2,545,143,904
	-	-	-	-	5	214,451	458	969,700

※ Quarantine records of exported animals include 4,550 insects in 2010 and 7,670 insects in 2011.

Table 5. Quarantine and Inspection Record by Support Authority in 2011

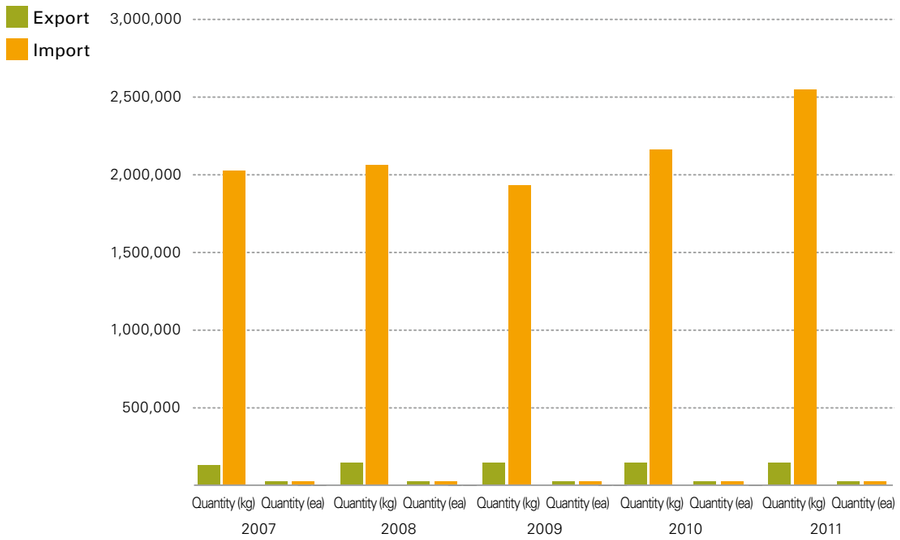
Authority	Animal				Livestock products			
	Export		Import		Export		Import	
	Case	Animals/groups	Case	Animals/groups	Case	Quantity (kg, ea)	Case	Quantity (kg, ea)
Seoul Regional Office	1,422	2,030	557	164,068	5,289	58,427,841	10,503	43,016,270
	-	-	-	-	-	-	7	88
Incheon International Airport Regional Office	5,952	78,833	8,832	216,184	549	5,319,103	51,593	102,311,856
	-	-	2	70	3	3	382	947,934
Yeongnam Regional Office	845	108,169	378	327,622	2,768	67,069,800	21,420	639,023,142
	-	-	-	-	-	-	35	21,488
Junbgu Regional Office	223	75,748,726	128	1,715,891	2,747	20,636,574	68,923	999,056,939
	-	-	-	-	2	214,448	34	191
Honam Regional Office	29	920,039	112	1,115,905	1,040	18,648,331	7,372	761,734,549
	-	-	-	-	-	-	-	-
Jeju Regional Office	17	18	22	1,211	21	391,092	1,353	1,149
	-	-	-	-	-	-	-	-
Total	**8,488**	**76,857,815**	**10,029**	**3,540,881**	**12,414**	**170,492,741**	**161,164**	**2,545,143,905**
	-	**-**	**2**	**70**	**5**	**214,451**	**458**	**969,700**

1) Import/Export Animal Quarantine Trends by Year



※ Quarantine records of exported animals include 4,500 insects in 2010 and 7,670 insects in 2011.

2) Import/Export Livestock Quarantine Trends by Year



Plant Quarantine

1. Introduction

As Korea's national brand value and international trade have increased with the successful hosting of G20 Seoul Summit in late 2010, the conclusion of FTAs and resource diplomacy, the quantity of import quarantine has also been increasing. As increasing international trade has raised the risk of intrusion and spread of foreign diseases and pests, QIA is performing strict quarantine services on plants imported through normal trade routes to prevent their introduction to Korea. Also, we are operating special judicial officers to monitor and investigate illegally imported plants.

The purpose of plant quarantine service is to establish world-class plant quarantine for customers. In 2011, we selected seven missions for this purpose and made utmost efforts to build an efficient and powerful border quarantine system.

First, we improved border quarantine to prevent the introduction of foreign plant pests. With quarantine needs increasing significantly, we also developed scientific and reasonable pest hazard management measures, promoted special quarantine measures, and tightened up on violators of the Plant Protection Act.

Second, we supported the export of Korean agricultural products to achieve 7.6 billion USD of exports. We successfully increased the export by discovering promising agricultural products, concluding export quarantine negotiations with four countries including the U.S. for four items such as tomatoes and table grapes, supporting prompt onsite quarantine services and guiding strict implementation of quarantine requirements to earn the trust of our trading countries.

Third, we improved the plant pest management system in response to global warming. We reassessed the risk of quarantine pests to improve the management system and constantly updated the data registered on the pest information system. Also, we established a rapid response system for early detection and prevention of the spread of foreign pests.

Fourth, we played a leading role in expanding international cooperation for plant quarantine. We

organized training programs by inviting plant quarantine experts from the ASEAN region, hosted workshops with Asian countries to establish the international standards, and conducted various training projects to support border quarantine system in developing countries, including inviting plant quarantine officers from Laos for technical transfer.

Along with the above missions, we actively promoted the seven major missions, including improving infrastructure for advanced quarantine services, supporting quarantine service for agricultural food as a green growth engine, and creating customer-centered, fair and harmonious organization culture, to realize the MIFAFF slogan "Wealthy Farm/Fishery Towns, Happy People."

Our plant quarantine officers are guarding the borders day and night to protect our farms and natural environments from the intrusion of foreign pests and diseases into the Korean peninsula that is becoming subtropical due to global warming.

2. 2011 Plant Quarantine Results

I. Border Quarantine to Prevent Introduction of Foreign Pests

1) Special Quarantine Measures in Response to Increasing Quarantine Demand

We conducted special quarantines on the food for ancestral rituals before the New Year's Day and Korea's Thanksgiving Day, on seeds and seedlings in spring, and on tropical fruits in summer when the demands for quarantine services increase. Each regional office autonomously operated the items and periods of field quarantine services for special needs, such as the increasing number of imported cut-flowers such as carnations (Apr/May), pine mushroom (Oct), and vegetables and seasonings for Kimchi (Nov).

We selected and conducted stricter quarantine on items with high risk of pests during special quarantine period, while we quickly processed safe plant quarantine items for smooth customs clearance for the convenience of consumers.

Also, we operated an independent special monitoring squad to monitor violators of the Plant Protection Act for establishing order in plant quarantine.

2) System Improvement to Manage Isolated Cultivation Plants and Import-Permitted Banned Items

i) For accurate understanding and reasonable management of isolated cultivation plant quarantine method, we performed safety management and verification inspection twice from the beginning to the end of import quarantine to supervise compliance with related regulations on facilities and places.

For the inspection of isolated cultivation plant management, we surveyed 745 cases of 44 institutions in May and November of 2011. This survey found complaints/suggestions for improvement of system operation (12 cases) and onsite correction (1 case) to contribute to better operation and safer management according to relevant regulations.

ii) We developed the prohibited item tracking system to help consumers track its location and to ensure the quarantine safety of import-banned items permitted for tests/research, genetic resources, or international fairs throughout the process of inspection.

3) Differentiation of Inspection Method by Pest Hazard of Imported Plants

For efficient border quarantine, we comprehensively conducted risk analysis of pest contamination by imported plant, including processing/packaging condition and use of the imported plant, selected nine low-risk items, such as dried mint flower and dried prunusavium, and amended the notification on "Document Review, Field Inspection and Laboratory Test Methods (QIA Notification No. 2011-107)" to expedite the quarantine process only with document review by skipping field inspection and laboratory test. The amendment increased the number of items subject to document review only from 182 to 190 to simplify the quarantine procedure and also ensure quarantine safety through regular spot check.

4) Efficient Quarantine Management Using the "Plant Quarantine Situation Management System"

For more scientific and efficient quarantine management system with diversified import/export items and countries, we completed the "plant quarantine situation management system" on March 5, 2011 to replace the previous fragmented post response system with the comprehensive proactive response system. The plant quarantine situation management system comprehensively analyzes import items, import country, time of import, quarantine sites, and pests to quickly provide the information to quarantine officers in cooperation with quarantine sites and eliminate possible causes of civil complaints.

II. Support for Export of Korean Agricultural Products

1) Negotiations on Export Quarantine

In 2011, we concluded export negotiations with four countries on four items. The first negotiation was about Korean fresh table grapes to Australia. The main export requirements included the registration of vineyards, packing houses and treatment facilities at Animal, Plant and Fisheries Quarantine and Inspection Agency (QIA), QIA plant quarantine officer's field inspection of registered vineyards during the cultivation period, proper control measures against Australia's pests of concern during the cultivation period, Korea-Australia plant quarantine officers' joint export inspection (only during the first export

season), the attachment of plant quarantine certificate with specific additional declaration and on-arrival quarantine inspection for consignments by Department of Agriculture, Fisheries and Forestry (DAFF) of the Australian Government.

The second settlement was about Korean fresh table grapes to New Zealand. The main export requirements included the registration of vineyards, packing houses and treatment facilities at QIA, proper control measures and field inspections against New Zealand's pests of concern during the cultivation period, surveillance trap survey of export areas to verify fruit fly-free, bagging of fruits to control pests during the cultivation period.

The third one was about Korean fresh table grapes to Canada. The main export requirements were the designation of export areas according to 'Horticulture-specialized Production Complex Management Guideline,' bagging from fruit setting to harvest, disinfection of un-bagged grapes, field inspections against Canada's pests of concern before harvest, and the identification of farmers on the packaging box.

The fourth was about the export of Korean pet plants, fresh tomatoes and shepherd's purse roots to America. Main requirements included the production of 26 kinds of plants for export with approved growing media (vermiculite and fertilization) that have never been used for packaging material or another use and do not contain sand or soil, the registration and management of production facilities according to the 'Horticulture-specialized Production Complex Management Guideline,' approval of production facilities by APHIS inspector, inspection of Bactrocera depressa on both inside and outside the pest-exclusionary structures, export inspection for 2% of cargoes, cutting inspection for 1kg fruits and the certification of packaging from shepherd's purse fields free from the following quarantine nematodes; Hemicycliophora koreana, Paratylenchus pandus, Rotylenchus orientalis, and Rotylenchus pini.

In addition, the export requirements of four items from four countries were relaxed. For the Korean grafted cacti, the export requirements were eased by allowing the export in the case where packing and disinfection place is separated from the tree nursery, replacing the requirements for attendance of QIA quarantine officer with simple verification measure, and reducing the concentration of Imidacloprid to 0.015%. For the Korean fresh table grapes destined for the U.S., the requirements were also relaxed by reducing the frequency of field inspection from four times to twice, thereby saving labor costs of farmers and quarantine officers. And the Korean fresh pears exported to Taiwan were allowed to enter packing houses without bags, so that the fruit sorting process became more flexible. For the Korean tangerines exported to the Philippines, the relaxed export requirements were exemptions from preclearance inspection by the Philippine inspectors, plastic bag packing requirements, registration number identification of farmer or packing house on the phytosanitray certificate, and the identification of the name of orchard instead of the name of packing house or farmer.

2) Invitation of Quarantine Officers from New Export Markets

Korea is currently negotiating with 17 export countries including U.S on 43 items and 95 cases. After pest risk assessment of the countries, we will invite the plant quarantine officers from the countries to ensure quarantine safety and identify control measures and finalize the negotiation.

We started negotiating with Australia on the export of Korean table grapes since 2010, and we agreed on risk management of domestic grapes, invited Australian quarantine officers, and verified the phytosanitary control system of the export areas in August, 2011. As a result, we successfully concluded the negotiation with Australia in December, 2011. To export tangerines to the Philippines following the agreement made in 2010, we also invited the Philippine quarantine officers to tour around tangerine orchards and fruit packing houses and resolved the packing and field quarantine issues.

Furthermore, we have invited the U.S. quarantine officers since 1986 to implement field quarantine on pears exported to the U.S. and Taiwanese plant quarantine officers every year to conduct field survey of fruit packing houses and orchards of apples and pears according to the agreement with Taiwan to export Korean apples and pears reached in 2006.

3) Support for Export Quarantine of Agricultural Products

We are pursuing research projects to resolve export issues and increase exports of our agricultural products by developing pest risk analysis data for prospective export items and effective control measures of pests of concern in our trading countries. We will continue 16 ongoing projects in 2012 and start new research projects. The 2011 research to support export quarantine of agricultural products focused on the application of the results to the quarantine sites and the advancement of quarantine services.

Among the business plan, the 2012 budget for agricultural product export quarantine services (6330-6332-300) was assigned 1.35 billion KRW, consisting of 1.33 billion KRW for tests/research costs and 19 million KRW for operating and promoting costs. We have spent 929 million KRW for the ongoing projects (16 projects) and 400 million KRW for new projects in 2012. There have been five projects areas, including pest survey on potential agricultural exports (pest survey in the export areas and fruit packing houses of paprika, table grape, and persimmon), development of identification methods for quarantine pests of export countries (development and distribution of rapid diagnostic technology for pest classification and identification), development of risk management measures for quarantine pests of export countries (research for the development of methods to inhibit and manage pests of concern in export countries, like disinfection methods for agricultural exports), development of pest risk analysis data for potential agricultural exports (pest risk analysis data for apples, pears, tangerines, melons, and ginseng), and support for agricultural product export quarantine (information collection and economic analysis).

4) Management of Export Areas and Provision of Training for Farmers

We are designating and operating export areas and fruit packing houses in accordance with the agreements on the export of agricultural products with trading countries. We are operating export

areas for pears, table grapes, and persimmons exported to the U.S. and fruit packing houses for apples and pears to Taiwan (34 export areas and 133 fruit packing houses in 2011). Furthermore, we are implementing pest surveillance and field inspection on export areas to export Korean agricultural products. In 2011, we conducted field inspection twice before bagging and harvesting for the export of pears to the U.S., Canada, and Australia, four times for table grapes exports to the U.S., three times for persimmons, and once for apples to Taiwan. We are also working with local governments to perform pest surveillance survey for the export of pears to Canada and Australia and apples to Taiwan.

In 2011, we implemented surveillance survey of export areas twice with local surveillance agents for the field inspection of pears exported to Canada and assigned the surveillance agents to perform surveillance on carposina sasakii every other week from June through October for the apples exported to Taiwan.

As trade countries are demanding stricter quarantine requirements, it has become important to train local farmers. Thus, we have trained farmers since 2009 with MIFAFF's Agricultural Product Sales Promotion Funds; 8,097 farmers on pears for the U.S. and Canada and apples and pears for Taiwan in 2009; on pears for the U.S., Canada, Taiwan, and Australia, apples for Taiwan, and persimmons and table grapes for the U.S. in 2011.

III. Improvement of Disease and Pest Control System in Response to Climate Change

1) Improvement of System to Share Information on Diseases and Pests

i) Tele-diagnosis network for fast and accurate identification of diseases and pests

We have used a tele-diagnosis network system in which plant pest experts can use the microscopic video clips transmitted via the Internet in real-time for video conferences to perform classification, identification, and risk analysis of diseases and pests. Using this network system, we have classified and identified 55 diseases and pests detected from imported plants and implemented mentoring and training on the issue through the video conference and information-sharing system.

ii) Operation of Pests Information System (PIS) and improvement of image library

We have improved the database program, including quarantine statistics, search, and design, to improve the access and reliability of information in the Pests Information System (PIS), which has been operating since 2004. We have entered data sheets for 1,100 species of diseases and pests being managed and about 7,200 data on diseases in Korea (the Korean Society of Plant Pathology, KSPP), foreign diseases and pest outbreaks, and specimen information. Also, we improved programs for the video database on classification and identification of diseases and pests using high-resolution images and produced and included new high-resolution images of 200 species, including coleopteran and stinkbugs.

2) Collection and Analysis of Foreign Quarantine Information

In 2011, we collected a total of 1,030 pieces of information from abroad to proactively respond to changes in the foreign plant quarantine environment, including safe guards/lifting orders (19 cases), reinforced quarantine orders (5 cases), use of quarantine information trends and pest risk analysis (52 cases), and other references (954 cases).

In particular, we gathered information on diseases and pests prohibited in Korea, including the citrus greening disease from Latin America and the fruit flies from Japan, to take safeguard measures to prevent the introduction of foreign diseases and pests and protect Korea's agricultural environment. We also investigated the enactment (amendment) of plant quarantine regulations of our trading countries, including the tissue culture quarantine requirements of Australia, and actively promoted these amendments to regional offices and related importers/exporters to support the exportation of Korean agricultural products.

IV. Expansion of International Cooperation in Quarantine for Global Leadership

1) Expansion of Contribution to the Activities of International Organizations

International Plant Protection Convention (IPPC/FAO) and Asia Pacific Plant Protection Commission (APPPC/FAO) and Sanitary and Phytosanitary Committee in World Trade Organization (SPS/WTO) are the major international organizations for plant quarantine. In 2011, a Korea representative, the vice chairman of IPPC, participated in the Bureau meetings (consisting of 7 regional representatives from 7 FAO regions) held three times a year, discussed the implementation of the overall IPPC activities, business plan and budget, and led the Strategic Planning & Technical Assistance working group meeting as chairperson. Korea contributed fifty thousand dollars as voluntary trust funds to support IPPC activities. And the Plant Quarantine Department of QIA has hosted and supported the regional workshops on International Standards for Phytosanitary Measures (ISPMs) in Asia to broaden the understanding on the standards draft and collect various opinions of the Asian countries. In 2011, 30 experts from 16 countries participated in the workshop held in Haeundae, Busan. QIA supported the participation of 14 experts from 14 countries. QIA's contribution to this regional workshop has been recognized as the most continuous and efficient support by IPPC.

Picture 1. The 6th IPPC Meeting (Mar 14-Mar 18, 2011, Rome FAO Headquarters)

Picture 2. IPPC Strategic Planning & Technical Assistance Working Group Meeting (Oct 4-Oct 7, 2011, Rome FAO Headquarters)

Also, the Plant Quarantine Department hosted an international workshop in Seoul for development of the electronic phytosanitary certificate (ePhyto). Forty experts from 23 countries, including USA, Japan, and Australia, participated in this workshop to identify current issues and develop future plans. IT experts and plant quarantine experts from QIA participated in the workshop. Based on the result of this workshop, ISPM on ePhyto will be adopted in 2013.

Picture 3. IPPC ePhyto International Workshop Opening

Picture 4. Culture Experience after the Workshop (Gyeongbokgung Palace)

2) Invitation of ASEAN Plant Quarantine Experts

The Plant Quarantine Department has been conducting projects to invite ASEAN plant quarantine experts since 2006 to reflect opinions of eight ASEAN countries[1)] and adjust the project. As a follow-up action of the 8th Korea-ASEAN summit in 2004, this project was suggested by the Korean minister at the ASEAN+3 Agriculture Ministerial Meeting in 2005 and has been implemented since 2006. This plan was recognized as the most useful program at the 10th Korea-ASEAN FTA Economic Cooperation Work Association Meeting (Cambodia, July, 2010).

During May 17-27, 2011, the invitation events were held at the QIA's Plant Quarantine Department and Agricultural Biology NICEM laboratory of Seoul National University. In 2011, 16 experts from 8 ASEAN developing countries were invited, along with two experts from Taiwan, one of Korea's major importers of Korean fresh fruits and a Singaporean expert at his own expense. On the request of participating countries, mini workshops on mycotoxin identification were held for four days, receiving favorable reviews.

The training covered Korea's plant quarantine system, international collaboration in plant quarantine, plant quarantine and disinfection, risk analysis of imported plant pests, pest classification, computing system, isolated cultivation and detection method for viruses and pests. It also included field trips to aT Center, flower markets, traditional markets and large malls and a visit to Jungbu regional office to receive information about its tasks, lab tests, inspection of sapling storage house, cereal import mother ships and vegetable examination and a visit to the inspection field of Pyeongtaek district office, along with a field trip to the Plant Quarantine Technology Center for the isolation and detection methods for viruses, pests and nematode.

Picture 5. Opening Ceremony

Picture 6. Plant Quarantine Technical Center: Nematode Isolation Practice

Picture 7. Mini Workshop on Fungi Identification

Picture 8. Nami Island Tour

1) Vietnam, Brunei Darussalam, Indonesia, Lao PDR, Malaysia, Myanmar, Singapore, Thailand, Philippines, Cambodia 10 countries

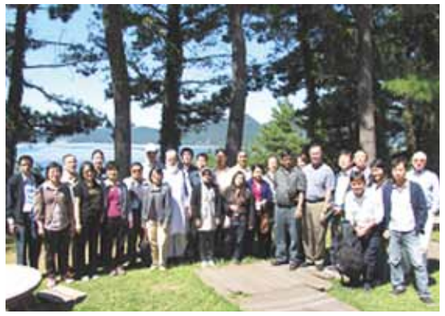
3) Asia and Pacific Plant Protection Commission (APPPC) Asian Regional Workshop

QIA has been hosting and supporting Asian regional workshops on the International Standards for Phytosanitary Measures (ISPMs) to promote understanding of ISPMs and collect opinions from the Asian countries since 2006. In 2011, 30 experts from 16 countries participated in the workshop held in Haeundae, Busan. QIA supported the participation of 14 experts from 14 countries. In 2011, five international standard drafts were discussed, with the Asian countries' opinions collected.

Picture 9. Holding a workshop for Asian countries to establish international standards for plant quarantine

Picture 10. Commissioner's Welcome Speech

Picture 11. Gyeongnam Oedo Tour



Picture 12. Discussion on the Draft ISPMs

4) Support for Border Quarantine System of Developing Countries

As a plant quarantine international cooperation project, QIA conducted a project to support border quarantine system in developing countries since 2011. Lao PDR was selected as the first country and an MOU on plant quarantine international cooperation was signed (November, 2011). To understand and assess the Lao plant quarantine capacity, QIA conducted on-site survey and invited six plant quarantine inspectors from Laos for training, including lectures, on-site training, field trip and cultural visit for 2 weeks.

Also, QIA donated 60 sets of portable inspection equipment, laboratory consumables and books to the Lao plant quarantine inspectors.

Picture 13. Korea-Laos Plant Quarantine Cooperation MOU Agreements

Picture 14. Portable Inspection Equipment Donation

V. Continuous Expansion of Infrastructure for Quarantine Advancement

1) Public Relations to Communicate with Customers

We have recognized that communicating with the public (customers) is most important for successful plant quarantine services to contribute to the safety and improvement of agricultural production and the protection of natural environment. In this regard, we have actively promoted plant quarantine as follows:

First, we installed plant quarantine halls at the 7th Busan City Agricultural Show (March 24-27, 4 days), the 16th Goyang Korea Flower Show (April 29-May 15, 17 days) and the 10th Korea Agricultural Show (October 21-30, 10 days) to promote plant quarantine to visitors by playing video clips, and inviting visitors to experiential learning activities, including microscopic observation of diseases and pests that are invisible to the naked eye.

Picture 15. Goyang Flower Show Info Box

Picture 16. Goyang Flower Show Promotion Performance

Second, we used agriculture publications (Korean Agriculture News, Korean Horticulture News, Agriculture Information News, and FAO Newsletter) to promote the roles of plant quarantine agency and the importance of plant quarantine.

Third, we used the Airport Limousine Buses to promote plant quarantine. We attached plant quarantine promotion stickers on the seat covers of 48 Airport Limousine Buses operating in the southern part of Gyeonggi-do, including Suwon, Yeongtong, Anyang, and Gunpo, to promote the importance of plant quarantine to airport limo users.

Fourth, we disseminated 12 kinds of 122,280 promotional materials, including card-type USBs to QIA visitors and participants of quarantine experience programs for better understanding about the importance of plant quarantine.

Aquatic Creature Quarantine

1. Introduction

Damages by disease outbreaks of aquatic animals farmed in Korea are estimated about 300 billion KRW on a yearly basis and the increasing import of live aquatic animals has raised the risk of foreign epidemics. But there had been no systematic quarantine or disease control management system until the Aquatic Creature Disease Control Act was enacted in December 2008.

This Act has made it possible to manage the risk of foreign epidemics through the quarantine of imported aquatic animals and plants, and protect Korea's aquaculture industry and aquatic ecosystems through the quarantine of carryon items of international travelers that can introduce aquatic animal diseases.

As the quarantine needs are increasing with the increasing trade of aquatic creatures following the recent FTAs, we are making efforts to increase quarantine targets and improve the methods to build a systematic and scientific quarantine system. We are also developing multifaceted quarantine measures to establish a comprehensive management system for aquatic creature diseases and to promote public health by ensuring production and supply of safe aquatic creatures. For the advancement of quarantine services, we are promoting as follows:

First, we have strengthened quarantine measures to prevent the introduction of foreign aquatic creature diseases. We have built a quarantine system to collect and analyze foreign disease outbreak information and improve the systems for rapid response through improved quarantine services and disease control measures.

Second, we have adopted a genetic testing method to stop illegal entry of exotic fishes. We have introduced the genetic analysis method by species to prevent illegal mixture of cheaper foreign species and the trade of internationally endangered species. By doing so, we are doing our best to prevent financial losses of the aquaculture industry and protect the aquatic ecosystems.

Third, we have conducted research on import risk analysis of aquatic animals and plants. We have evaluated the risk of financial losses which Korea's aquaculture industry or aquatic environment can suffer in case of aquatic creature disease outbreak and conducted research to develop measures to reduce the risk when importing aquatic animals and plants.

In addition, we have dispatched quarantine officers to exporting countries to import superior species and offered technical training by the international reference laboratories to improve the capacities of quarantine officers.

2. 2011 Aquatic Creature Quarantine Results

I. Enhancement of Border Quarantine to Prevent the Introduction of Foreign Aquatic Creature Diseases

1) System for Emergency Quarantine Measures in Case of Foreign Animal Disease Outbreak

The 「Notification on Import/Export Quarantine Methods and Standards for Designated Items」 was revised (Sep 2011) to establish the measures for prompt response to urgent quarantine needs in case of aquatic creature disease outbreak in an exporting country.

2) Introduction of Genetic Identification Method of Species to Inhibit Illegal Entry of Aquatic Animals and Plants

We have introduced a genetic identification method of species to prevent illegal mixture of cheaper foreign species (*A. bicolor, etc*) due to the decreased catch of eels farmed in Korea (*Anguilla japonica*) and illegal entry of European eel (*Anguilla japonica*), which is an endangered species. For this purpose, we have developed and applied a method to collect and analyze genetic data of four major imported eels (4 species).

3) Introduction of Superior Species by Dispatching Quarantine Officers

We have dispatched 12 aquatic quarantine officers to local fishery farms in China six times to resolve the shortage of manila clams and young ark-shells in Korea and conducted rapid quarantine to import 2,739 tons of superior species that passed the quarantine.

II. Improvement of Quarantine for Advanced Quarantine System

1) Faster Import Quarantine by Rapid Diagnostic Kit for White Spot Disease

We have adopted rapid diagnostic kits for white spot disease to resolve the civil complaints about the loss of large quantities of shellfish and deteriorated product quality during storage for laboratory tests. For this purpose, we have introduced the latest analysis method by verifying effectiveness in accordance with OIE standards and promoting technical training in Korea and abroad. The kit has shortened the quarantine period (5 days to 3 days) to reduce civil complaints and improve analysis efficiency.

2) Training Programs for Building Capacities of Quarantine Officers

Since 2009, we have dispatched 19 quarantine officers to the OIE reference laboratories, including the Japanese Aquatic Proliferation and Cultivation Institute, the Virginia Institute of Marine Science, and the French Research Institute for Exploitation of the Sea in nine countries, and constantly promoted technical training for disease diagnostic technology and human resources development to improve their professional skills.

We have also offered workshops and training programs to appoint 55 quarantine officers and 125 entrusted quarantine officers, and have constantly developed capacity building programs for quarantine officers.

Picture 17. The 2011 Fisheries Quarantine Workshop for Professional Competence

3) Reliable Quarantine Services by Designating More Private Quarantine sites

We have designated and secured 440 private quarantine sites (non-bonded warehouses), including fish farms and tanks outside the quarantine center for aquatic animals and plants through meetings with businesses and cooperation with the Customs Office and conducted inspection on these sites at least once a year to ensure hygiene and disinfection.

Table 6. Designated Quarantine Sites

Type	Site	Major Quarantine Items
Total	440	
Water Tanks	135	Edible seafood (red sea-bream, clams), crustaceans (wary crabs, etc)
Fish Farms	259	Transplantable fishes (eels, mudfish, etc)
Aquarium	16	Tropical aquarium fish
Low Temperature Warehouse	30	Edible shellfish (manila clams, clams), aquarium fish
Enclosed Net in the Sea	-	Highly migratory fishes among the transplantable (bluefin tuna, etc)

※ Enclosed Net in the Sea: Temporarily designated during quarantine period (seven locations in total).

III. System to Share Information on Aquatic Creature Diseases

1) Regular Monitoring of Foreign Aquatic Creature Diseases

We have researched the disease trends and import/export quarantine regulations of our major trading countries in advance via the OIE and WTO Homepages for timely response to stricter quarantine and export support measures and built a system to share information with our affiliates and related authorities by regularly updating disease information on the MIFAFF and QIA Homepages.

2) Cooperation Through International Conferences

We have participated in the regular meetings of Sanitary and Phytosanitary (SPS) Committee in the OIE and WTO, the major international organizations related to aquatic animal and plant quarantine, as the delegations of MIFAFF, to actively engage in the current issues about aquatic animal and plant quarantine, and collected and analyzed information on disease outbreaks for quarantine measures. We have also improved cooperation with delegations from other countries to collect the quarantine information of exporting countries, promote onsite surveys for the technical training of quarantine officers and participate in the establishment of international standards.

3) Collection of Quarantine Sanitary Information Through Survey of Exporting Countries

We have visited the Instituto Colombiano Agropecuario (ICA, Institute of Agriculture) of Columbia, the major exporter of aquarium fish, and their quarantine center and exporting industries to investigate their aquatic creature disease management and demanded stricter sanitation control. We have also investigated the distribution and trade routes, like scallop farms and fish markets in Japan, to improve border quarantine of luggages.

3. 2011 Import/Export Quarantine Results of Aquatic Creature

I. Aquatic Creature Import-Export Quarantine Trends

1) Import-Export Quarantine Records

(Unit: tons, 1,000 USD)

Year	2009			2010			2011		
	Cases	Weight	Amount	Cases	Weight	Amount	Cases	Weight	Amount
Total	51,539	135,625	351,687	52,682	120,656	393,529	49,920	105,271	517,440
Import	51,527	135,621	351,342	52,639	120,651	393,089	49,889	105,264	517,204
Export	12	4	345	43	5	440	31	7	236

2) Quarantine Records by Use

(Unit: tons, 1,000 USD)

Purpose		2010			2011		
		Cases	Weight	Amount	Cases	Weight	Amount
Total		52,682	120,656	393,529	49,920	105,271	517,440
Import	Total	52,639	120,651	393,089	49,889	105,264	517,204
	Aquarium	35,832	76	3,382	36,415	73	3,912
	Edible	16,518	117,842	330,006	13,027	99,446	419,039
	Transplantable	283	2,732	59,701	445	5,743	94,252
	Research and investigation	6	1	0	2	2	1
	Other	-	-	-	-	-	-
Export	Total	43	5	440	31	7	236
	Aquarium	36	2	344	25	1	127
	Edible	1	0	60	2	2	35
	Transplantable	1	0	0	-	-	-
	Research and investigation	-	-	-	-	-	-
	Other	5	3	36	4	4	74

※ Other: Exported ark-shell parents (China) and lugworms for baits (Italy).

3) Major Importing Countries by Use

Type	Importing Country		Major Importing Countries
	2010	2011	
Total	67	61	
Aquarium	32	27	Indonesia, Philippines, Thailand, China, Singapore, Taiwan, Malaysia, Colombia, Germany, America, Brazil, Peru, etc.
Edible	17	20	China, Japan, Canada, America, Russia, New Zealand, Panama, Belize, Australia, Bangladesh, etc.
Transplantable	12	13	China, Hong-Kong, America, Philippines, Canada, Indonesia, Thailand, etc.
Research and investigation	6	1	America

4) Import Quarantine Rejection Records

Table 7. Year 2010

(Unit: kg, USD)

Use	Kind	Importing Country	Cases	Weight	Reason for Rejection	Corrective Measure
Total			6	7,655		
Edible	Subtotal		3	7,210		
	Manila clam	China	1	7,000	WSD	Incinerated
		North Korea	1	100	WSD	Incinerated
	Scallop	Japan	1	110	WSD	Incinerated
Aquarium	Subtotal		2	4		
	Guppy	Singapore	1	3	SVC	Incinerated
	Colored Carp	Thailand	1	1	KHD	Incinerated
Transplantable	Subtotal		1	441		
	Pacific Bluefin Tuna	Japan	1	441	RSIVD	Incinerated

※ WSD (White Spot Disease), SVC (Spring Viraemia of Carp), KHD (Koi Herpesvirus Disease), RSIVD (Red Sea Bream Iridoviral Disease)

Table 8. Year 2011

(unit: kg, $)

Use	Kind	Importing Country	Cases	Weight	Reason for Rejection	Corrective Measure
Total			14	24,850		
Edible	Subtotal		6	8,860		
	White Clam	China	2	3,780	WSD	Incinerated
	Manila Clam	China	2	220	WSD	Incinerated
	Venus clam	China	1	4,752	WSD	Incinerated
	Purple Washington clam	China	1	108	WSD	Incinerated
Aquarium	Subtotal		6	5		
	Aquarium Crustacean (4 kinds)	Indonesia	2	1	WSD	Incinerated
		Malaysia	1	1	WSD	Incinerated
		Singapore	1	1	WSD	Incinerated
		Haiti	1	1	WSD	Incinerated
	Israel Carp	Thailand	1	1	KHD	Incinerated
Transplantable	Subtotal		2	15,985		
	Israel Carp	China	2	15,985	KHD	Returned

Import/Export Inspection of Fishery Products

1. Introduction

While domestic fishery products are decreasing due to reduced fishing grounds and fishery resources in coastal waters following climate change and the UN Law of the Sea, the importation of fishery products is increasing due to the full opening of fishery markets under the WTO system, following the conclusion of FTAs and increasing popularity of seafood as healthy food. Against this backdrop, there are growing concerns about the safety of fish and fishery products mainly due to the increasing number of defective fish and fishery products contaminated by hazardous materials, such as malachite green, domestic and foreign hazards information, for example, radioactive contamination of the products in the wake of the nuclear incident in Fukushima, Japan and the negative impact of environmental pollution in coastal waters.

Also, as many countries around the world, including the U.S. and the EU, are demanding stricter sanitation requirements of fishery imports for the public health and safety, we are making every effort to ensure stringent sanitation control and safety, and boost the exportation of our fish and fishery products as follows:

First, we have established close cooperative relationships in sanitation with major exporting countries. For our major exporting countries, like China, Vietnam, and Indonesia, which often deliver defective fish and fishery products, we made them to register processing plants and improved local sanitary inspection according to the existing sanitation agreements, made sanitary certificates mandatory to control products from manufacturing process in exporting countries, and temporarily suspended importation from registered facilities contaminated by harmful substances, including heavy metals and antibiotics.

In particular, we have designated frequently rejected items as major inspection target to improve laboratory tests during import inspection and prohibited the introduction of defective products through prompt laboratory tests when we receive information on hazards, such as malachite green and nitrofuran.

2. System Improvement

I. System Improvement to Support Exportation of Fish and Fishery Products

1) Relaxation of Document Review on Inedible Fish and Fishery Products

We have performed sensory tests for the export inspection of edible and inedible fish and fishery products (fish meal, fish oil, etc) requiring sanitary certificates, and amended the Agricultural and Marine Products Quality Control Act to perform only document review on inedible fishery products with less strict sanitation standards to simplify the export inspection process, expedite the customs clearance and improve the efficiency of inspection.

2) Relaxation of Sanitary Inspection on EU-Registered Ships

Although the number of EU-registered ships has increased with private/public investments to nurture the pelagic fish industry, most ships are operating in the open oceans, such as the Atlantic Ocean and the Pacific Ocean, making it hard to conduct sanitary inspection once a year according to relevant regulations. Also, more and more ships avoid inspection because of the cost of fuel and business losses (average 170 million KRW of fuel costs and 800 million KRW losses per ship) incurred when entering into port to be inspected. The Agricultural and Marine Products Quality Control Act has been amended to require sanitary inspection once every two years to ensure that all EU-registered ships are inspected while allowing their operation.

3. Inspection Trends of Fishery Exports

I. General Status

1) Legal Basis

- Article 88 of 「Agricultural and Marine Products Quality Control Act」 (Inspection of Fish and Fishery Products)
  - Fish and fishery products and processed marine products purchased and reserved by the government
  - Inspected according to international agreements or at the request of trading countries

2) Inspection Methods

- Document review: review application documents including product daily log to determine pass-fail
- Sensory test: visual, character, smell inspection with five sensory organs
- Laboratory test: physical, chemical or microbiological tests

II. Inspection Trends of Fishery Exports

(Unit: case, ton, %)

Category	2000		2005		2010		2011	
	Case	Quantity	Case	Quantity	Case	Quantity	Case	Quantity
Inspection	8,408	132,854	11,765	128,983	17,645	315,701	15,857	367,997
Rejected	15	106	87	413	291	6,123	171	2,008
Rejection rate	0.2	0.1	0.7	0.3	1.6	1.9	1.1	0.5

The Korean government's deregulation policies have changed the export inspection for fish and fishery products from mandatory to optional since September 1998, causing an increase in the quantity of exports by 177% compared to 2000, a rapid increase in trading countries and the number of exported items from 37 countries and 72 items in 1997 to 94 countries and 595 items in 2011. In particular, China's economic growth has boosted consumption of fish and fishery products, with Korean exports to China accounting for nearly 40%.

∗ Country: ① China (40%), ② Vietnam (9%), ③ Germany (7%), ④ Indonesia (7%), ⑤ Thailand (4%)
Item: ① Frozen Pollack (19%), ② Frozen Squid (12%), ③ Fish Meal (11%), ④ Frozen Mackerel (9%), ⑤ Frozen Cod (5%)

III. Inspection of Fish and Fishery Products for Domestic Consumption or Reserve

We inspected the laver products for the Korean Army and the fish and fishery products reserved by the Korean government, such as frozen pollack and frozen squid, to ensure the supply of safe fish and fishery products to the army bases and to stabilize the market prices of fish and fishery products by inspecting 6.88 tons of reserved fish and fishery products.

∗ Domestic Consumption: Roasted laver, dried laver, and dried laver (stone laver), etc for the Army - (2008) 291 tons → (2009) 307 tons → (2010) 201 tons → (2011) 125 tons
∗ Government-reserved: Frozen pollack, frozen squid, frozen mackerel, etc. - (2008) 4,838 tons → (2009) 2,984 tons → (2010) 3,856 tons → (2011) 6,800 tons

4. Inspection Trends of Fishery Imports

I. General Status

1) Legal Basis

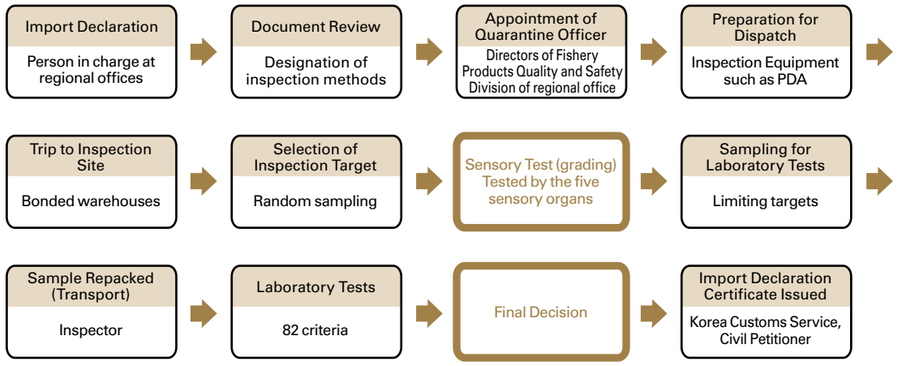
- Article 19 of the 「Food Sanitation Act」 and Article 12 of its Enforcement Rules
  - Those who intend to import food for sale shall declare importation and undergo inspection according to the Ministry of Health and Welfare's Ordinances.
- Articles 32 and 37 of the 「Regulation on the Delegation and Consignment of Administrative Authority (Presidential Decrees)」
  - The Commissioner of Korea Food & Drug Administration delegates or consigns the inspection of imported fishery products to the Minister for Food, Agriculture, Forestry, and Fisheries (the Commissioner of QIA) according to the Food Sanitation Act (enforced from January 1, 1994).

2) Targets and Types of Inspection

The inspection targets are raw aquatic animals and plants and simple processed products; raw aquatic animals and plants include live fish and shellfish, fresh, refrigerated & frozen products and seaweeds (but, for blowfish, it is limited to the 21 species of edible blowfish registered in the Korean Food Standards Codex) and simple processed products include non-deformed aquatic animals and plants that are simply cut, peeled, heated, aged, dried or salted without food additives or other ingredients.

∗ Highly processed foods, such as canned goods, fish cakes, and seasoned processed foods, are inspected by Korea Food & Drug Administration.
The types of inspection include document review, sensory test, laboratory test, and random sampling inspection based on import history by country and by item. If there is a concern of residues harmful to human body, heavy metals, antibiotics, and food poisoning bacteria will be inspected according to the Korean Food Standards Codex (82 kinds).

3) Imported Fish and Fishery Product Inspection Procedure



II. Inspection Trends of Fishery Imports

(Unit: case, ton, %)

Item	2000		2005		2010		2011	
	Case	Quantity	Case	Quantity	Case	Quantity	Case	Quantity
Inspection	49,156	514,761	96,112	932,085	78,911	1,007,859	72,822	1,046,488
Rejected	341	2,433	292	1,559	255	2,030	278	2,498
Rejection Rate	0.7	0.5	0.3	0.2	0.3	0.2	0.4	0.2

The decline in domestic production and the trade liberalization in July 1997 led to a constant increase in fishery imports from about 500,000 tons per year before 2000 to 1.05 million ton as of late 2011, which is expected to remain unchanged.

The trading countries and items diversified from 81 countries and 607 items in 1997 to 89 countries and 866 items in 2011.

∗ By country: ① China (33%), ② Russia (29%), ③ Taiwan (6%), ④ Vietnam (5%), ⑤ Japan (4%)
By item: ① Frozen Pollack (22%), ② Frozen squid (6%), ③ Frozen mackerel (5%), ④ Frozen shrimp (5%), ⑤ Frozen pacific saury (5%)

III. Improvement of Safety Inspection on Fishery Imports

1) Priority Control Through Special Inspection

As major measures to improve inspection, the ratio of laboratory tests constantly increased from 27% in 2009 to 28% in 2010, to 32% in 2011 and the items of inspection for veterinary medicinal products (antibiotics, etc) were expanded to 44 kinds as of the end of 2011. Based on special inspection in the wake of the crude oil spill in the Gulf of Mexico (April 20, 2010) and the Bohai Bay in China (July 2011), we added the benzopyrene inspection standards on June 30, 2010. We have been performing special inspection on 18 harmful substances, including MG (malachite green) and nitro furan since July 2005 and frequently rejected items (2 or more times) were designated for major inspection to perform laboratory tests on 19 items from 10 countries in the second half of 2011.

We performed special inspection on 17 substances, including MG and nitrofuran, as a part of import inspection in 2011, and frequently rejected items, including Taiwanese tilapia, are subject to separate priority control. The rejected items were 20 from 9 countries in the first half of 2011 and 19 items from 10 countries in the second half of 2011.

To ensure the safety of new harmful substances, the monitoring of local fish and fishery products was expanded from 1,157 cases in 2010 to 1,393 cases in 2011 for eight substances, including dicofol and endosulfan.

IV. Trends of Radioactivity Tests on Fish and Fishery Products from Japan

1) Improved Radioactivity Tests for Public Safety After the Nuclear Incident in Japan

(Previous) We classified fish and fishery products into freshwater products and seawater products by country and inspected the initially-declared imports (with stricter standards applied in case of nuclear experiment).

∗ No rejection has been recorded since radioactivity tests were introduced in 1994.

(Current) We perform radioactivity tests on all fish and fishery products imported from Japan and conduct stricter inspection on all migratory fish species off the coast.

Table 9. Radioactivity Tests

Category	Place of Origin (Frequency of Inspection)	Target Items
Domestic	Coastal waters (once a week)	• The East Sea: Flatfish, wary crab, herring, squid, kelp • The South Sea: Tile fish, hairtail, mackerel, conch, laver, sea mustard • The West Sea: Yellow corvina
	Pelagic (once a week)	• Pollack, tuna, shark, pacific saury (products from Taiwan are inspected every time)
Imported	Japan (all cases)	• All imported fish and fishery products
	Tuna (once a week)	• Major fishing countries: Japan, Taiwan, America, Mexico, New Zealand
	Pacific fish (once a week)	• Hagfish, pollack, mackerel, pacific saury

2) Additional Radioactivity Testing Equipment & Improvement of Inspection Method in Preparation for Rapid Increasing Demand

We expanded testing devices from 3 to 16 units and adopted rapid detection method to save time (3 devices in the Department of Fishery Products Quality and Safety, 5 in Korea Institute of Nuclear Safety, 4 in Korea Atomic Energy Research Institute, 3 in National Fisheries Research and Development Institute, and 1 in National Agricultural Products Quality Management Service). Live and refrigerated products are first tested to ensure the quality and minimize inconvenience of civil petitioners.

3) Improved Safety Measures During Production Stage in Japan

(Import suspension) We temporarily suspended import of restricted fish and fishery products from Fukushima Prefecture (sand lance, masou salmon, dace, and sweetfish)

(Traceability System) Exporters are required to attach the Japanese government's inspection certificate and the certificate of origin since May 14. The 13 prefectures/cities requiring the certificates are Fukushima, Ibaraki, Tochigi, Gunma, Chiba, Miyagi, Yamagata, Nigata, Nagano, Saitama, Kanagawa, Shizuoka, and Shizuoka. The remaining 34 prefectures/cities are required to provide the certificate of origin.

4) Special Radioactivity Tests Considering Migrating Time (All Negative)

We inspected the squids from Yamato Bank (7 pieces) that migrate to Korea through the Tsugaru Strait and the salmon that grow in Northern Pacific Ocean to return to Korean rivers (9 pieces) and found all negative.

Also, we increased the inspection of pacific saury from Taiwan near the site of nuclear incident in Japan from 50% to 100%.

5) Radioactivity Inspection Results of Fish and Fishery Products from Japan (Mar 14 to Dec 31, 2011)

The inspection of a total of 4,532 cases (4,049 from Japan, 186 from the Pacific Ocean, and 297 local) found that all cases satisfied food standards. However, a trace of radioactive substance was detected in 21 cases (17 cases from Hokkaido) of fish and fishery products from Japan (12 cases of refrigerated pollack and 4 cases from refrigerated cod).

Quality Inspection of Salt

1. Introduction

When the Salt Management Act was enacted in 1963, sun-dried salt was classified as minerals, not food. In addition, Korean sun-dried salt was no longer cost competitive as imported salt was allowed in July 1997. The Korean government pursued a countermeasure to shut down the salt ponds (1997-2004), but this only reduced the area of salt ponds, not the number of producers, which only worsened the salt industry.

Considering that sun-dried salt is still used for traditional food like Kimchi and sauces, the Korea Food and Drug Administration notified the amendment to include sun-dried salt in the list of table salt in the 「Standards and Specifications of Food」, which classified sun-dried salt into food since March 28, 2008. As follow-up measures, the government recognized the need to nurture the salt industry and introduce quality tests for food production, but the previous Salt Management Act failed to meet the new demands. Thus, the act was amended and newly implemented on August 11, 2010 to strengthen quality control and provide comprehensive and systematic support for the salt industry.

Today, those who produce or import salt for distribution or sale must undergo quality inspection conducted by the salt inspection agency. The inspection methods include document review, sensory test, and laboratory test on edible/inedible domestic and imported salt and salt byproducts.

2. Inspection Status of Domestic/Imported Salt

I. Inspection of Domestic Salt

All types of domestic edible (sun-dried salt, processed salt, refined salt, white salt, burned salt and molten salt) and non-edible salt and salt byproducts are subject to inspection, but all edible salt except for sun-dried salt may skip the inspection under the 「Food Sanitation Act」.

Table 10. Salt Ponds across Korea and Their Production Records

Metropolitan cities/provinces	Sun-dried Salt Ponds		Production Records (tons)	
	Producers	Size (ha)	2010	2011
5	1,165	4,165	222,448	368,701
Incheon	3	38	1,201	4,032
Gyeonggi	22	171	4,140	6,557
Chungnam	66	671	19,149	33,348
Jeonbuk	4	128	5,350	9,108
Jeonnam	1,070	3,157	192,608	315,656

The inspection methods include document review, sensory test and laboratory test.

Document review examines application documents for quality inspection to determine whether a product is acceptable or not, and the sensory test examines the shape, color, smell, taste and foreign materials for edible and inedible salt and salt byproducts by organoleptic measures. Finally, laboratory test is an inspection method with lab test equipment to determine whether a product is acceptable or not, including document review and organoleptic test. The test targets include five general substances, including moisture, insoluble matters, and sodium chloride; and six harmful substances, including heavy metals, sulfate ions, and ferrocyanide ions.

II. Inspection of Imported Salt

All types of imported inedible salt (sun-dried salt, processed salt, rock salt and refined salt) and salt byproducts are subject to inspection. Korea currently imports inedible salt from nine countries for industrial use, animal feed, snow removal, dying and glass manufacture.

Table 11. Records of Importation by Country (2011)

Country	Name of Product	Cases	Weight (tons)	Use
9	-	373	2,450,879	-
Netherlands	Processed salt, Refined salt	12	264	Animal feed
Mexico	Solar salt	23	547,116	Industrial use
Spain	Processed salt	6	264	Animal feed
Israel	Seawater salt for decoration	4	79	Decoration
India	Sun-dried salt	11	255,900	Industrial use, Snow removal
Japan	Refined salt, White salt	7	45	Glass manufacture
China	Solar salt, Refined salt	183	129,642	Snow removal, Dyeing, detergents
Pakistan	Solar salt, Rock salt	75	120,675	Snow-removing, Korean dry sauna
Australia	Solar salt	52	1,396,894	Industrial use

The inspection methods include document review, organoleptic test and laboratory test.

Document review examines application documents for quality inspection to determine whether a product is acceptable or not, and organoleptic test examines the color, smell, coagulation and foreign materials by organoleptic measures.

Finally, laboratory test is an inspection method with lab test equipment to determine whether a product is acceptable or not, including document review and organoleptic test. Only salt byproducts undergo laboratory test for sodium chloride, moisture and insoluble matters.

Quality inspection of imported inedible salt is carried out by QIA with document review and organoleptic test and some products are inspected by Korea Salt Manufacture Association.

Table 12. Quality Inspection of Imported Salt (2011)

Category	Case (%)	Weight (tons)
Total	373(100)	2,450,879
Document review	284(76)	2,355,821
Organoleptic test	89(24)	95,058
Laboratory test	-	-

02

Control and Prevention of Animal Disease

1. Introduction
2. Control Status of Major Animal Diseases

1. Introduction

The purpose of control and prevention of animal disease is to prevent the occurrence and spread of contagious animal diseases and minimize the loss of farm households; for this purpose, we perform a series of control activities from husbandry to final slaughtering. In particular, Korea has maintained BSE-free status and effectively prevented and controlled HPAI that occurred on December 29, 2010 to earn HPAI-free status on September 5, 2011. We are devoted to improving livestock productivity and increasing exportation by eradicating or minimizing major contagious animal diseases, such as bovine brucellosis, swine fever, and Newcastle disease. Another goal is to reduce the outbreak of zoonoses, such as bovine tuberculosis and rabies, and prevent its transmission to improve public health and supply safe and sanitary livestock products. Our major disease control activities include preventive measures, such as regular clinical surveillance/disinfection, and emergency control measures, such as standstill of susceptible animals, laboratory tests and epidemiological investigation in case of emergency. To investigate the outbreak situation of animal diseases in Korea, we perform serological surveillance as a part of surveillance activities and train/promote/instruct disease control technologies to lay the foundation for autonomous onsite disease control.

The regulations relevant to animal disease control include the Act on the Prevention of Contagious Animal Disease and its enforcement ordinances and rules. The MIFAFF enforces 14 notifications including the guidelines for the disease control of six contagious diseases (FMD, HPAI, swine fever, tuberculosis and brucellosis, Newcastle disease, and Aujesky's disease), the certification of swine/poultry farms with outstanding sanitation and disease control, the surveillance of contagious animal diseases, the compensation for stamping out, the operation of disinfecting facilities and disinfection, disease control at swine farms, poultry farms and hatchery, and the infectious animal diseases subject to recycling the carcass. Also, the four directives include the responsibilities of animal disease control officers, the operation of joint disease control program operating team, regulations for FMD epidemiological investigation committee, and foreign animal disease control. The standard operating procedure includes the guidelines for public disease control veterinarians. QIA operates the guidelines for animal disease diagnosis (notification), the regulations for central epidemiological surveillance team (directive), and the regulations for operating zoonoses (contagious) committee (standard operating procedure). We also operate seven emergency response guidelines for FMD, AI, swine fever, transmissible spongiform encephalopathy (TSE), bovine spongiform encephalopathy (BSE), rabies, and brucellosis to take emergency measures in response to suspected cases of contagious diseases.

Animal control disease organizations include Livestock Policy Center's Disease Control Division and Disease Control Management Division of MIFAFF, and QIA as central organizations; Livestock Divisions in Seoul, Metropolitan Cities, provinces, cities/districts and 43 livestock disease control offices of local governments as regional organizations. Livestock Health Control Association is a private disease control organization dedicated to eradicating animal diseases and supplying safe livestock food.

In terms of the major responsibilities of each animal disease control organization, MIFAFF Livestock Policy Center's Disease Control Division establishes animal disease control policies, operates relevant laws and systems, secures and supports the budget for national disease control programs, and performs general tasks related to national disease control. QIA's Animal Disease Control Department (6 divisions) operates the disease control system for animal diseases; establishes and executes disease control measures; develops standardization and guidelines for animal disease control technologies; instructs/trains/promotes animal disease control technologies; performs epidemiological investigations and studies in case of contagious animal disease outbreaks; conducts research and development of animal disease epidemiological investigation and analysis techniques; collects and analyzes animal disease surveillance information; develops and studies surveillance systems; monitors/studies/investigates the statistics of animal diseases, the diagnosis of animal diseases, and the diseases subject to national disease control programs; conducts research on the pathological mechanism and diagnosis of animal diseases; develops and studies the policies and systems of animal protection and management; and performs nationwide diagnosis and collection inspection. It is also in charge of technical instruction and onsite disease control support for local governments and research and development of veterinary science and technology related to advanced diagnosis of animal diseases, preventive medicine, and pesticide/ heavy metal/harmful material residue analysis. Cities and provinces (districts) execute national disease control policies, develop local disease control measures and perform animal disease control with local budget. The animal disease control organizations affiliated to cities and provinces perform animal disease surveillance, examination, diagnosis and serological surveillance in their jurisdictions.

2. Control Status of Major Animal Diseases

I. Control Status of FMD

FMD had been eradicated in Korea after an outbreak in Hamheung in 1934, but 66 years later in 2000, 15 cases were discovered in six regions, including Paju, Gyeonggi-do. Also, 16 cases were discovered in the cattle and pigs in four regions, including Anseong, Gyeonggi-do, in 2002, but Korea has regained disease-free status since 2002.

Table 1. FMD Outbreaks and Control in 2000 and 2002

Category	2000	2002
Occurrence	• March 24~April 15(22 days) • 15 cases (cows) ∗ 6 cities/districts in 3 provinces – Paju in Gyeonggi, Hongseong in Chungnam, Chungju in Chungbuk	• May 2-Jun 23 (52 days) • 16 cases (15 pigs, 1 cows) ∗ 4 cities/districts in 2 provinces – Anseong, Yongin, Pyeongtaek in Gyeonggi, Jincheon in Chungbuk
Cause Assumed	• Imported hays • International travelers (shoes, livestock products)	• Foreign workers
Control Measure	• 2,216 animals stamped out (cows within 500 m of affected farms). • Vaccination within 10 km (2 times).	• 160,155 animals stamped out (cows within 500 m and pigs within 3 km of affected farms). • Vaccination excluded.
Eradication in Korea	• 1 year after vaccination. • Regained disease-free status: Aug 31, 2001	• After standstill (Aug 14). • Regained disease-free status: Nov 29, 2002
Direct Damage	• 300.6 billion KRW · Stamping out compensation: 7.1 · Disinfectant/vaccination: 20.2 · Stabilization funds: 0.27 · Animal purchase: 242.8 (444,000 animals) · Management funds: 30.2	• 143.4 billion KRW · Stamping out compensation: 53.1 · Disinfectant/vaccination: 15.4 · Stabilization funds: 7.5 · Animal purchase: 33.7 (142,000 animals) · Management funds: 40.45

Table 2. FMD Outbreak and Control in 2010

Category	2010 (Pocheon)	2010 (Ganghwa)	2010 (Andong)
Occurrence	• Jan 2-Jan 29 (28 days) • 6 cases (cows) ∗ 2 cities/districts: Pocheon, Yeoncheon in Gyeonggi	• Apr 8-May 6 (29 days) • 11cases: 7 cattle, 4 pigs ∗ 4 local governments – Ganghwa in Incheon, Gimpo in Gyeonggi, Chungju in Chungbuk, Cheongyang in Chungnam	• From Nov 28 ∗ Last occurred in Apr 21, '11 • 153 cases (cows, pigs, etc) ∗ 75 cities/districts in 11 provinces
Cause (Assumed)	• Poor management of foreign workers	• Farmers' trips to affected regions	• Farmers' trips to affected regions
Control Measure	• 5,956 animals in 55 farms stamped out ∗ 2,905 cows, 2,953 pigs, and 98 goats/deer • Vaccination excluded.	• 49,874 animals in 395 farms stamped out ∗ 10,858 cows, 38,274 pigs, and 742 goats/deer • Vaccination excluded.	• About 3,500,000 animals stamped out ∗ 149,930 cows, 3,326,553 pigs, and 23,517 goats/deer, etc. • Vaccination.
Eradication in Korea	• After standstill was lifted on Mar 23	• After standstill was lifted on Jun 19 ∗ Regained disease-free status on Sep 27, 2010	-
Funds	• 29.8 billion KRW · Stamping out compensation: 9.3 · Stabilization funds: 0.1 · Animal purchase: 13.3 (26,515 animals) · Management funds: 3 (Loan) · Disinfectant/checkpoint: 3.1 · MOPAS Special Funds: 1	• 126.7 billion KRW (estimated) · Stamping out compensation: 68.1 · Stabilization funds: 1.3 · Animal purchase: 9.5 (45,158 animals) · Management funds: 22.2 (Loan) · Disinfectant/watch center: 23.1 · MOPAS Special Funds: 2.5	• 2,847.8 billion KRW (estimated) · Stamping out compensation: 1,886.3 · Stabilization funds/animal replacement: 46.8 · Management funds/animal purchase: 157.9 · Disease control: 193 · Burial site management: 46.7 · Water supply/water quality control, etc: 517.1

※ Reference: The White Book for FMD Central Disaster Safety Measures Headquarters (MOPAS, Nov '11) and the 2010-2011 White Book on FMD (Korea Rural Economic Institute, Oct '11)

In 2010, eight years after 2002, FMD affected cattle and pigs in six regions, including Pocheon and Ganghwa in Gyeonggi-do. The Korean government promptly took disease control measures in accordance with the Act on the Prevention of Contagious Animal Disease and its subsequent FMD control guideline and FMD emergency response guideline in the affected regions. As a result, the standstill order was issued in the first outbreak (Serotype A) that affected the cow farms in Pocheon and Yeoncheon of Gyeonggi-do six times in January 2010 and later was lifted on March 23. Unfortunately, the second outbreak (Serotype O) was discovered in April 2010 and affected 11 cattle and pig farms for a month in four cities/districts in four provinces. The standstill during the second outbreak was lifted on June 19 and the nationwide surveillance proved that the virus is no longer circulating in Korea to earn OIE's acknowledgement of FMD-free status on September 27.

However, this was not the end of FMD in Korea. It broke out again in Andong, Gyeongsangbuk-do at the end of November 2010 and each related authorities (MIFAFF, QIA, local governments, local offices, etc) and organization (associations, etc) installed the disease control situation centers to maintain the emergency system for 24 hours and take emergency response. Major disease control activities against FMD included stamping out susceptible animals in the affected farms, disposing their excretion including the semen, and disinfecting the farms, excretions, and nearby roads and towns. They also conducted zoning the affected farms into risk zones (within 3 km in radius), alert zones (within 10 km in radius), and control zones (within 20 km in radius), and installed movement control checkpoints on the major roads to control the animal movement and disinfect the vehicles to perform focused surveillance and laboratory tests.

After confirmation of FMD positive, QIA organized and operated the FMD Control Measures Situation Center consisting of General Situation Division, Epidemiological Investigation Division, Diagnosis and Serological Surveillance Division, Disease Control Instruction Division, Quarantine Measures Division, Distribution Monitoring Division, and Promotion Division. We urgently dispatched the Sampling Team to farms affected by suspected vesicular diseases and then the Central Disease Control Technical Support Team to encourage disease control measures, provide technical instruction and advice, and install and operate movement control checkpoints for onsite disease control. Also, the Central Epidemiological Investigation Team was dispatched to analyze the cause of the disease and its spreading route to promptly perform epidemiological and tracing investigation and distributed these analysis results to all cities and provinces nationwide to take appropriate disease control measures.

With FMD spreading fast across the country despite these efforts, the Korean government gradually increased the alert level from 'Caution (Nov 29)', 'Warning (Dec 15)', to 'Critical (Nov 29)' according to the Animal Disease Crisis Control Manual. Finally, ring vaccination was implemented for cattle farms in Andong and Yecheon of Gyeongsangbuk-do, and Paju, Goyang, and Yeoncheon of Gyeonggi-do with the

highest possibility of infection. As vaccination areas were expanded nationwide, QIA supplied vaccines for 46.52 million animals to give primary, secondary, and booster vaccination of a total of 12.67 million animals (3.54 mil. cattle, 8.8 mil. pigs, 70,000 deer, and 260,000 goats) by December 2011.

The nationwide FMD spread since late 2010 promted the government to take measures to advance animal disease control measures and overall livestock industry. According to the Animal Disease Control System Improvement and Livestock Industry Advancement Plan jointly presented on March 24, 2011 by the Prime Minister's Office, the Ministry of Strategy and Finance, the Ministry of Public Administration and Security, the Ministry for Food, Agriculture, Forestry and Fisheries, and the Ministry of Environment, the FMD control and emergency response guidelines were supplemented and revised (July 15, 2011) with guidelines on nationwide standstill orders, task force team for animal disease control, types of vaccination, and specific measures for non-vaccinated types.

In addition, promotion and training has been continuously provided for local livestock farms and the general public to raise disease control awareness. Livestock farms and related personnel received text messaging (SMS) containing information on preventing and disinfecting diseases, and articles and interviews were published and broadcasted to promote the FMD control policies for public cooperation. Guidelines for disease control measures and employment records of foreign workers (the Ministry of Employment and Labor) were provided to hep local governments to utilize during disease control. Livestock organizations and disease control officers of local governments were trained for better understanding of FMD and its control and QIA officers visted the site to improve and encourage disease control activities in regions affected by FMD.

As border quarantine measures to prevent the introduction of pathogens, we took various measures including disinfecting the shoes of international travelers, inspecting carryon items using x-rays and quarantine detector dogs, and safely treating the food wastes in airplanes and ships. Also, we built a cooperation system with airport and port authorities (Customs Office and Coastal Guards) to improve border patrol for smuggling. We used electronic boards for quarantine information at airports and ports, promoted campaigns regularly, and cooperated with airlines and shippers for various promotional activities through videos and promotional materials on FMD. For Chinese hays, in particular, we performed formalin fumigation after arrival in Korea in addition to onsite disinfection in China and collected samples for inspection before customs clearance. We strictly prevented the introduction of animal diseases from North Korea by disinfecting travelers and promoting prohibited livestock products from the North. QIA collected and analyzed data on the international trends of disease outbreaks everyday for related organizations and organized quarantine development commission in each airport/port to share information related to smuggled quarantine items. We connected information systems with the Ministry of Justice to build the Border Quarantine Management Systems for declaration, disinfection, and education for livestock farmers entering at airports/ports and improved the management of livestock farmers traveling abroad.

To verify FMD pathogens, we constantly inspected domesticated animals, imported hays, yellow dust, and livestock products; in particular, we performed nationwide FMD serological surveillance (326,000 animals, 150% increase compared to previous year) to detect infected animals in an early stage and inspected antibodies after vaccination to constantly search and verify whether to be vaccinated or not. To improve early response capacities, we implemented FMD command post exercise (CPX) with related offices and authorities. Moreover, QIA built an FMD Antigen Bank in England to prepare for the type of FMD not vaccinated in Korea.

II. Control Status of HPAI

HPAI occured in Korea, including 19 cases in 7 cities/provinces (10 cities/districts) in 2003/2004, 7 cases in 3 cities/provinces (5 cities/districts) in 2006/2007, 33 cases in 11 cities/ provinces (19 cities/districts/towns) in 2008, and 53 cases in 6 cities/provinces (25 cities/districts) in 2010/2011.
After Korea regained the HPAI-free status on August 15, 2008, there had been no outbreak of HPAI in Korea, but HPAI (H5N1) virus was detected in wild fowl a number of times after it was first discovered in wild fowl captured during AI routine surveillance inspection on December 7, 2010. Finally, HPAI broke out in poultry farms in Cheonan of Chungcheongnam-do and Iksan of Jeollabuk-do on December 29, 2010 and persisted for 139 days until May 16, 2011. Korea regained the HPAI-free status on September 5, 2011.

Table 3. Past HPAI Outbreaks and Control Measures

Category	2003/2004	2006/2007
Occurrence	• Dec 10, 2003-Mar 20, 2004 (102 days) • 19 cases in 10 cities/districts ∗ 19 cases out of 56 reported cases were positive.	• Nov 22, 2006-Mar 6, 2007 (104 days) • 7 cases in 5 cities/districts ∗ 7 cases out of 24 reported cases were positive.
Stamping Out and Disease Control Cost, etc	• 5,285,000 animals from 392 farms stamped out or buried • 153.1 billion KRW compensations	• 2,800,000 animals from 460 farms stamped out or buried • 58.2 billion KRW compensations
Disease-free Status	• 6 months after disease control at the last outbreak site (Sep 21, 2004)	• 3 months after disease control at the last outbreak site (Jun 18, 2007)

Category	2008	2010/2011
Occurrence	• Apr 1, 2008-May 12, 2008 (42 days) • 33 cases in 19 cities/districts/towns ∗ 33 cases out of 68 reported cases were positive.	• Dec 29, 2010-May 16, 2011 (139 days) • 53 cases in 25 cities/districts ∗ 53 cases out of 103 reported cases were positive.
Stamping Out and Disease Control Cost, etc	• 10.204,000 animals from 1,500 farms stamped out or buried • 307 billion KRW compensations	• 6,473,000 animals from 286 farms stamped out or buried • 82.2 billion KRW compensations
Disease-free Status	• 3 months after disease control at the last outbreak site (Aug 15, 2008)	• 3.5 months after disease control at the last outbreak site (Sep 5, 2011)

※ Reference: The White Book on HPAI (MIFAFF, Feb '12).

As HPAI virus was detected in wild fowl in Japan (Oct 14, 2010) and Korea (Dec 7, 2010) before HPAI affected poultry in Korea, the Korean government recognized the hazards of its occurrence and ordered disinfection and access control of migratory bird habitats and prohibited contact with wild fowl (Dec 8). Finally, HPAI warning was issued (Dec 10). Soon, the government strengthened the surveillance of poultry farms and traditional markets (Dec 12) and inspected disease control status at migratory bird habitats and vicinities in local governments (Dec 13-17).

Despite these efforts, AI suspected animals were reported in Cheonan of Chungcheongnam-do (breeding ducks) and in Iksan of Jeollabuk-do (breeding chicken) on December 29. Type H5 AI was diagnosed on December 30 and both cases were found highly pathogenic on December 31. As HPAI occurred in local poultry, the Korean government performed stamping out infected or suspected animals and other disease control measures, such as standstill, in accordance with the National Security Council (NSC) Crisis Management Standard Manual, the AI Control Instructions, and Standard Operating Procedure (SOP). The alert level was raised from attention to caution (Dec 31, 2010) and AI Control Measure Situation Room was installed, consisting of Situation Division, Epidemiological Investigation Division, Diagnosis and Serological Surveillance Division, Disease Control Instruction Division, Quarantine Measures Division, Distribution Monitoring Division, and Promotion Division for 24-hour emergency standby status. After receiving reports and verifying Type H5 AI, stamping-out and burial of infected poultry started immediately in the contaminated regions (within 500 m radius) and movement control checkpoints were installed and operated on major roads of control zones (contaminated/ hazardous/ alert) to disinfect people and vehicles and restrict access to prevent the spread of virus to other regions.

To rapidly identify infected farms, we inspected ducks and quails in nearby disease control zones and performed clinical observation (chicken) or laboratory tests (ducks) in poultry farms near migratory bird habitats (within 10 km in diameter). Livestock Health Control Association and producers' organizations (associations, etc) improved phone surveillance and promotion.

The detection results of low pathogenic AI, type H5 and H7 and major disease control activities were as follows: through the inspection of wild fowl excretion and captured wild fowl, H5H2 (1 case), H7N7 (2 cases), H7N8 (1 case), H7N4 (1 case), H5 Antibody (1 case), and H5 & H7 Antibodies (1 case) were detected in Cheongchoho Lake in Gangwon-do, Hangyeong-myeon in Jeju, Daedong Reservoir in Jeollanam-do, Mangyeonggang River in Jeollabuk-do, and Junam Reservoir in Gyeongsangnam-do; Preventive disease control measures were taken, including disinfection of the area, surveillance of farms, and prevention control of farms; We searched duck farms, the dormant sources of AI pathogens, to detect six cases of H7N7 and one case of N7N6 in three breeding duck farms (Damyang, Gokseong, and Jangseong in Jeollanam-do) and four duck meat farms (Hampyeong and Jangseong in Jeollanam-do and Yesan and Buyeo in Chungcheongnam-do); By tracing and inspecting epidemiologically related farm households, H7N7 was detected in two additional duck meat farms in Namwon, Jeollabuk-do to trigger standstill, preventive stamping-out, and surveillance for disease control.

Also, the inspection and management system for AI burial sites was improved to prevent environmental pollution and earn public trust. We worked with the Ministry of Environment and local governments to inspect 630 FMD and AI burial sites in 13 cities/provinces in the first half of the year (June) and the latter half of the year (Oct). Among them, signs and/or perforated drainpipes/observation wells were not installed in 387 burial sites and corrective measure were taken.

In addition to that, multifaceted efforts were made to prevent the outbreak of AI, including instruction, inspection, training, promotion, and drills. Local governments, livestock farms, and related companies were inspected for disease control status twice a year (June and October) and AI inspection status of migratory birds in the islands like Hongdo and Heuksando was investigated with the National Institute of Environmental Research (March). We also trained local governments' animal disease control and public health officers on AI (during June and July) with Korea Centers for Disease Control and Prevention and the Ministry of Environment. Internationally, we promoted AI control technical training in the ASEAN region (16 officials from eight countries, May-June) to eradicate HPAI in the ASEAN member nations.

There have been ongoing efforts to improve disease control capacity of local governments. MIFAFF, QIA, cities/provinces, cities/districts/towns, Livestock Health Control Association, and related organizations participated in the drill for HPAI outbreaks (September). We produced and distributed additional Type

H5/H7 HI diagnostic reagents to encourage fast diagnosis for prompt disease control measures and supplied AI gene diagnostic kits (Type H5/H7/H9 RT-PCR) to local governments to identify problems and improve sensitivity.

In terms of border quarantine measures, we performed laboratory tests on imported poultry meat (once for every 10 imports) and dispatch quarantine detector dogs or more quarantine officers for flights traveling from countries with AI outbreaks or hazardous regions to search and disinfect travelers and their luggage more strictly. We also installed 666 disinfectant foot baths in 240 airports/ports nationwide to disinfect the shoes of all entering travelers and continued promotion using quarantine promotional materials (leaflets, ball-point pens, etc), videos on boards or cabins, and subtitles on electronic displays to advise international travelers to avoid visiting farms or livestock farms in affected countries and bringing pet fowl or chicken meat back into Korea. We also attempted to promote border quarantine through the immigration channel (Mn TV) to prevent the reintroduction of AI and FMD.

The HPAI virus isolated from poultry farms in Korea at the end of 2010 (Cheonan in Chungcheongnam-do and Iksan in Jeollabuk-do) had phylogentic similarity with the virus isolated from wild fowl with 99.4% homology.

With HPAI continuously detected in wild fowl, such as migratory birds, in 2010/2011, it was found that inappropriate disease control measures in farms could lead to sporadic AI outbreaks. In response, the Korea government is planning to promote AI control measures to prevent the spread of virus and eradicate the disease as quickly as possible, maintain regular disease control systems to minimize the risk of outbreak, advance the disease control system, and improve disease control capacity to prevent the recurrence of AI through education and promotion.

III. Control Status of Bovine Brucellosis

In Korea, bovine brucellosis was first reported in milk cows in 1955 and occurred sporadically ever since. In case of Korean/imported beef cattle, stricter inspection in 2004, including inspection certification program (Jun 2004) and full inspection of disease-prone regions (Nov 2004) increased the detection of infected cattle. But the number of infected cows started decreasing in 2007 and the positive rate of brucellosis dropped to about 0.24% in 2011.

Table 4. Trends of Outbreaks by Year

Category	2005	2006	2007	2008	2009	2010	2011
Cases (Positive rate (%))	2,590 (1.80)	4,498 (2.18)	2,333 (1.07)	1,826 (0.86)	1,047 (0.52)	614 (0.34)	447 (0.24)
No. of Cows	17,690	24,454	11,547	8,409	5,953	4,296	3,547

※ Official statistics of cases of Korean/imported beef cattle excluding milk cows from 2009.

Since January 2008, with the purpose of eradicating brucellosis by 2013, the Korean government has been implementing the supplementary bovine brucellosis control measures focused on improving inspection system, strengthening standstill and re-inspection of farms in case of outbreaks, and establishing preventive systems by holding farms accountable for control measures. In detail, it involves regular inspection of all cows one year old or older in Korean/imported beef cattle farms at least once a year to improve the inspection system, requiring inspection certificates for all traded cattle, including Korean/imported beef cattle (calves) and milk cows, to improve the effectiveness of certificates, using uniform brucellosis inspection certification form nationwide, and reducing the term of validity of certificates (3 months to 2 months) to prevent alteration and forgery.

Also, all milk cows in breeding cattle farms, including young cattle before milking and pregnant cows, are inspected at least once a year in addition to the existing inspection of raw milk to protect milk cows from brucellosis.

IV. Control of Porcine Wasting Diseases

Porcine Reproductive and Respiratory Syndrome (PRRS) is known to occur sporadically in almost all swine farms across Korea, with its outbreaks increasing in February-March and in November and decreasing in summer between May and October. According to 2011 report, its outbreaks decreased from 137 cases in 2010 to 44 cases. Compared to 2010, overall outbreaks of wasting diseases decreased in 2011, including PED (12 → 5), PMWS (15 → 6), PCV-2 (544 → 378), and PRDC (97 → 19).

Table 5. Outbreaks of Porcine Wasting Diseases (Unit: cases)

Name of Disease	2005	2006	2007	2008	2009	2010	2011
Porcine Epizootic Diarrhea (PED)	25	30	36	21	18	12	5
Porcine Reproductive and Respiratory Syndrome (PRRS)	25	35	25	47	152	137	44
Post-weaning Multisystemic Wasting Syndrome (PMWS)	72	184	91	59	49	15	6
Porcine Circovirus (PCV2)	509	543	823	1,521	817	544	378
Porcine Respiratory Disease Complex (PRDC)	57	22	38	33	93	97	19

※ Includes the diagnostic results of Korea Animal Health Integration System (KAHIS), QIA, animal disease control organizations of cities/provinces, veterinary colleges, private diagnostic institutions, etc.

MIFAFF pushed ahead with porcine wasting disease stabilization measures to allow autogenous inactivated tissue vaccines (immune therapy) temporarily for certain farms from May 2008 through June 2009, considering the financial losses of farms and the lack of supply of porcine cicovirus vaccines. It has supplied commercial porcine cicovirus vaccines to swine farms nationwide since 2010 and the vaccines for 15 million animals (18 billion KRW) were supplied this year.

V. Control of Swine Fever

Swine fever was officially reported in Korea in 1947. It had occurred every year across Korea until 1999, but vaccination finally stopped on December 1, 2001 to achieve disease-free status as a result of strict swine fever eradication measures (3 steps) promoted since 1996. It recurred locally in Cheorwol of Gangwon-do in April 2002 and in Seo-gu and Ganghwa of Incheon and in Gimpo and Icheon of Gyeonggi-do in October-December of the same year. Entering 2003, it spread nationwide from a breeding farm in Gyeonggi-do and vaccination was conducted in all regions except for Jeju Island. Swine fever outbreaks decreased significantly after the vaccination, but it has been recurring sporadically due to the rejection of vaccination. Swine fever is classified as Type 1 Contagious Animal Disease as it spreads fast with high mortality rate. The causes of the recent outbreaks were unvaccinated pigs, bargain pigs from unknown sources, and omitted or delayed vaccination. The Korean government supplied vaccines for 35 million animals (9,955 million KRW) in swine farms across Korea in 2011 to eradicate swine fever, and animal disease control organizations in cities/provinces and QIA jointly performed serological surveillance of swine fever for 155,986 animals in 9,431 farms. The 2011 serological surveillance showed 98.5% of antibody positive rate nationwide (except for Jeju-do). To achieve swine fever-free status by 2014, the Korean government has been operating a private swine fever eradication committee since 2009 and promoting a system to support various policies, budget, regulations, systems, and manpower for the eradication projects of private organizations. Major project is the establishment of the traceability system by farm in slaughterhouses by assigning serial numbers to all swine farms across Korea and marking pigs for sale.

VI. Control Status of Rabies

In Korea, rabies was officially reported first in 1907 (17 animals) and occurred every year until 1984. Since it was found in a dog in Cheorwol of Gangwon-do near the Armistice Line in 1993, it has been affecting dogs, cattle, and raccoons every year. It used to occur near the Armistice Line in Gangwon-do and Gyeonggi-do, but constantly spread southward. The outbreaks have been limited to the northeastern part of Gangwon-do since 2007 (one case in Pocheon, Gyeonggi-do in 2008 spread to Sokcho). Among the 28 cases found between 2009 and 2010, 18 cases have occured in Goseong, Gangwon-do. Rabies generally occurs from early winter through spring because wild animals that carry and spread rabies, such as raccoons, come into contact with domesticated animals when they come down to towns (farms) in search of food in winter.

Table 6. Outbreaks of Rabies by Year (KAHIS Records)

Category	2004	2005	2006	2007	2008	2009	2010	2011
Affected Animals	29 (11 dogs, 9 cows, 9 raccoons)	15 (8 dogs, 5 cows, 2 raccoons)	21 (5 dogs, 12 cows, 4 raccoons)	3 (1 cow, 2 raccoons)	14 (4 dogs, 3 cows, 7 raccoons)	18 (1 dog, 12 cows, 5 raccoons)	10 (4 dogs, 5 cows, 1 raccoon)	4 (2 dogs, 2 cows)
Cases	26	14	19	3	14	18	10	4

The Korean government has been taking control measures to vaccinate animals against rabies and inject bait vaccines according to the yearly animal disease control programs to control rabies. Since 2002, we have performed serological surveillance against rabies in the regions affected by rabies in the past to understand and analyze the immunization of vaccinated animals for disease control and surveillance. In 2011, we randomly selected the farms in 9 cities/districts affected by rabies in Gangwon-do and visited there to collect blood samples (up to two animals per farm) and inspected a total of 540 animals (360 dogs and 180 cows). Gyeonggi-do has been excluded from the serological surveillance as there has been no reported case of rabies there since 2007.

The antibody positive rate in dogs decreased by 6.5% over the previous year, with low prevalence of antibodies in Goseong and low immunity in Hwacheon and Hongseong. About 8% of positive animals showed protective titer lower than the standard titer (above 0.5 IU), indicating the need of revaccination. The average titer of positive animals was 1.9 IU/ml, which was adequate level.

The overall antibody positive rate of cows decreased by 5.2% compared to the previous year in the nine cities/districts and its deviation was significant among the cities/districts. The immunization was considerably low in Cheorwon and Hwacheon and in Sokcho and Yanggu, showing that vaccination needs to be expanded with an increase in rabies outbreaks among cattle. The average titer of antibody-positive animals was 2.3 IU/ml and higher than that of dogs.

Comparing the antibodies of Gangwon-do by year, more than 70% of dogs had antibodies against rabies in 2003 and 2004, but the prevalence of antibodies has been maintained at 60% since 2005. In case of cows, the prevalence of antibodies fluctuated significantly by year, but the average was 40%.

We are planning to expand vaccination in rabies-prone regions (Goseong, Sokcho, Yanggu, and Inje), promote vaccination in cities/districts with low prevalence of antibodies of cows (local instruction and promotion in Gangwon-do), perform selective serological surveillance in 2012 in rabies-prone regions and in areas with low prevalence of antibodies in 2011, and indirectly support distribution of bait vaccines for wild animals.

VII. Preventive Control Status of Bovine Spongiform Encephalopathy (BSE)

BSE was first discovered in cows in England in 1985 and 190,000 cases have occurred in 25 countries ever since. It has never occured in Korea. Its outbreaks have decreased since 2000 in Europe, but it was found in Eastern Europe, including Greece, Slovakia, and Slovenia, in 2001 and even in Israel and Poland in 2002. It affected 45 cows in 10 countries in 2010 and 29 cows in nine countries in 2011 (Canada, France, Ireland, Netherlands, Poland, Portugal, Spain, Switzerland, and England).

Table 7. Recent BSE Outbreaks by Country (Unit: Animals)

Year	England	Belgium	Denmark	France	Germany	Ireland	Italy	Nether lands	Portugal	Spain	Switzer land	Japan	Canada
2003	611	15	2	137	54	183	29	19	133	167	21	4	1
2004	343	11	1	54	65	126	7	6	92	137	3	5	1
2005	225	2	1	31	32	69	8	3	46	98	3	7	1
2006	114	2	0	8	16	41	7	2	33	68	5	10	5
2007	67	-	-	9	4	25	2	2	14	36	-	3	3
2008	37	-	-	8	2	23	1	1	18	25	-	1	4
2009	12	-	1	10	2	9	2	-	8	18	-	1	1
2010	11	-	-	5	-	2	-	2	6	13	-	-	1
2011	7	-	-	3	-	3	-	1	5	6	2	-	1
Total*	184,618	133	16	1,019	419	1,651	144	88	1,080	779	466	36	19

※ Total: OIE data (1989-Dec 31, 2011)
Austria (8), Finland (1), Israel (1), Greece (1), Luxemburg (3), Liechtenstein (2), Slovenia (8), Czech Republic (30), Poland (70), Slovakia (25), USA (2), Sweden (1)

The border quarantine to protect Korea from BSE includes banning the importation of BSE-related products from 37 countries, including 23 countries affected by BSE and 14 countries with potential hazards, and designating BSE-related products (680 HS codes) as goods subject to the Director of Customs Office to ensure that products from banned countries are not imported to Korea through a third country.

We have been performing nationwide surveillance to monitor the introduction of BSE to Korea and expanding inspection every year since 1996. As the BSE surveillance standards of OIE changed from the number of animals to the scores assigned to each surveillance in 2005, Korea adopted Type A Surveillance in 2007 and OIE recommended us to achieve the target score of 300,000 points before considering the evaluation of BSE status. In response, we started improving the BSE surveillance programs and inspecting as many potential groups of cattle as possible on May 18, 2008. And finally, we achieved the target score by making inspection of all downer cows in slaughterhouses mandatory, inducing BSE inspection of all naturally dead cattle registered in Nonghyup Deductive Insurance, and stringently inspecting cattle with BSE-like symptoms. After reaching the target, we applied for the recognition of BSE risk status to OIE and finally acquired 'Controlled BSE Risk' status in May 2010.

Table 8. OIE Scores Acquired for Last 7 Years (2005-2011)

Year	BSE-like Symptoms		Incidental Deaths		Natural Deaths		Normal Slaughter		Total	
	Cattle	Score	Cattle	Score	Cattle	Score	Cattle	Score	Cattle	Score
2005	16	4,550	585	748.3	94	47.1	3,459	506.72	**4,154**	**5,852.12**
2006	2	1,500	1,169	1,521.5	159	75	4,686	716.03	**6,016**	**3,812.53**
2007	91	45,945	3,277	3,829	236	82.4	4,764	730.59	**8,368**	**50,586.99**
2008	292	155,370	5,538	6,226	165	93.6	12,667	1,835.69	**18,662**	**163,525.29**
2009	377	181,295	5,509	5,498.29	57	20.5	22,099	3,236.54	**28,042**	**190,050.33**
2010	31	16,690	4,372	4,134.1	263	92.4	16,119	2,325.64	**20,785**	**23,242.14**
2011	71	22,600	4,813	4,802	209	81.8	14,514	2,047.88	**19,607**	**29,531.68**
Total	880	427,950	25,263	26,759.19	1,183	492.8	78,308	11,399.09	105,634	466,601.08

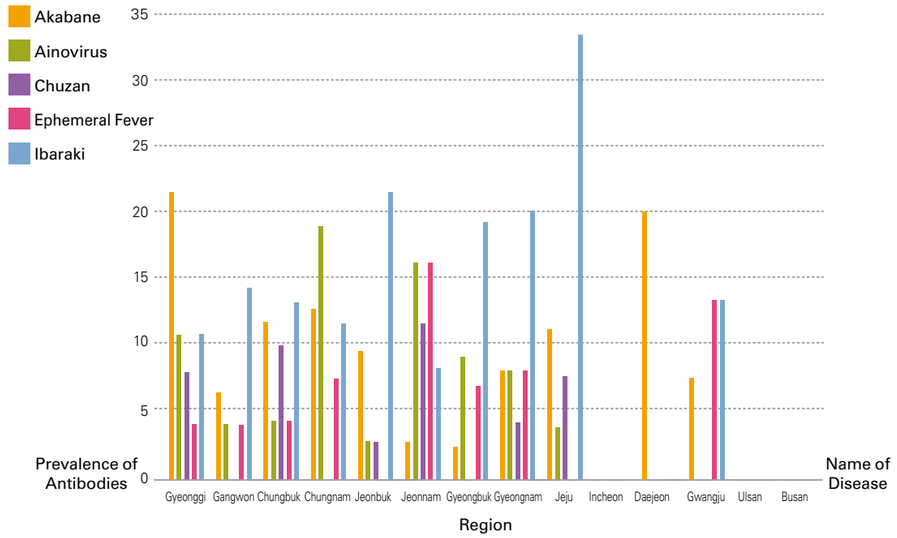
We have improved the post-management of cattle imported from BSE outbreak countries (USA and Canada) and domesticated in Korea (48 cows in five cities/districts) to make it mandatory to perform BSE inspection of target cows at the time of death, selection, and slaughtering and defer market distribution until they are found BSE negative. Also, we are constantly monitoring farms' compliance with prohibited use of animal ingredients in feeds for ruminants to improve safety management of animal feed. We are also promoting cross-contamination prevention for animal feed by examining mixture of animal ingredients, renovating the facilities to separate production lines, and adopting Hazard Analysis and Critical Control Point (HACCP) for feed plants. We have been building BSE labs in local cities/provinces since 2005 to perform prompt BSE surveillance at local animal disease control facilities in 17 cities/provinces and QIA conducts verification inspection in case of positive response.

VIII. Control Status of Bovine Arthropod-borne Diseases

The 2011 survey of the regional distribution of serological antibodies against bovine arthropod-borne diseases (5 viruses) found that there was no region with particularly significant fluctuation in the prevalence of antibodies. It was found that the prevalence of antibodies against Akabane virus, Ainovirus virus, and Chuzan virus decreased in the second half of 2011 compared to the first half of 2011, indicating that the antibodies formed in 2010 persisted until the first half of 2011 and the cattle in Korea was not exposed to the above three viruses during the summer of 2011. There was no reported case of bovine arthropod-borne diseases in 2011 and the prevalence of antibody also decreased, demonstrating that there was almost no damage caused by bovine arthropod-borne diseases in 2011. Investigation on the distribution of serological antibodies by year showed that the prevalence of antibodies against Akabane virus, Ainovirus, and Chuzan virus dropped significantly by more than 20% in 2011 compared to 2010 and slightly increased against bovine ephemeral fever (BEF) and Ibaraki virus.

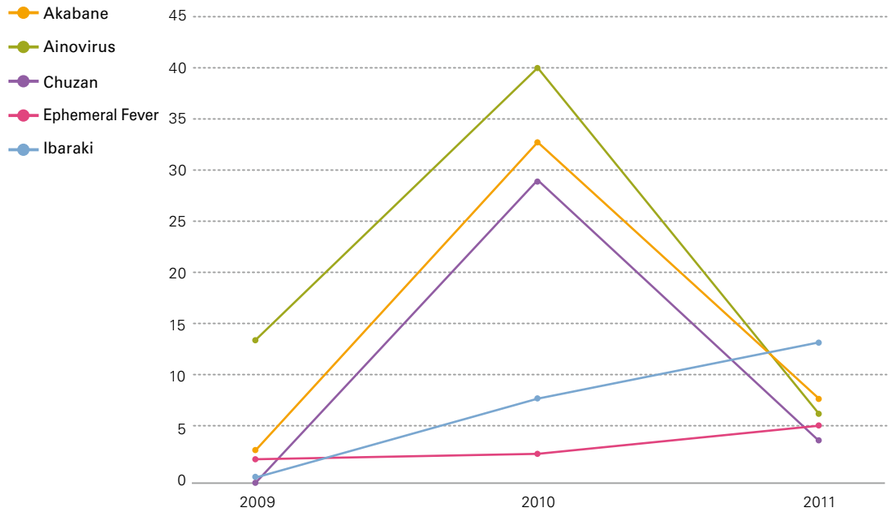
As there is the risk of Arbovirus infection, especially Akabane virus and BEF infection leading to persistent damage (stillbirth, etc), advance public relations will be needed and the 2012 serological surveillance plan will be established by improving the results of the 2011 serological surveillance. As some regions collect blood sample from different calves in the first and second half of the year and the blood serum of one animal is requested separately from different animals, there is a difficulty analyzing serum test results.

Figure 1. Fluctuation in the Prevalence of Antibodies in antibody-negative calves during the Second Half of the Year



※ Includes only antibody-negative calves in the first half among the samples matching the serial numbers of calves.
1) Prevalence of antibodies of animals with 1:4 or more neutral antibody titer.

Figure 2. Fluctuation in the Prevalence of Antibodies against Arbovirus by Year



03

Surveillance and Control of Exotic Plant Pests & Import Risk Analysis

2011's Surveillance and Control of Exotic Plant Pests

1. Monitoring Areas and Target Pests
2. Surveillance Method

Import Risk Analysis

1. Definition of Import Risk Analysis
2. Procedure of Import Risk Analysis
3. 2011 Import Risk Analysis Status

2011's Surveillance and Control of Exotic Plant Pests

1. Monitoring Areas and Target Pests

I. Monitoring Areas

We investigated airports/airports, isolated cultivation areas, planting areas of plants imported less than one year, and planting areas of plants in export areas (all regions cultivating exported plants).

II. Target Pests

We investigated the initially introduced pests that may have a critical impact on local agricultural/forestry products, the pests that are already present in certain regions with the possibility to spread and critically affect local agricultural/forestry products, and the pests that may impact the exportation of agricultural/forestry products or other goods.

2. Surveillance Method

As surveillance methods for exotic plant pests, we appointed plant quarantine officers to conduct monitoring trap, light trap, glue board survey or field surveillance and professional plant pest monitoring agents to investigate the outbreaks of pests in import/export planting areas. The following table shows the number of traps installed by investigated item:

Table 1. Number of Traps Installed for Each Item of Investigation

Item	Number	Period	Location	Target Pests
Prohibited Pest Monitoring Trap Survey	670	May-Oct (Jeju: Apr-Oct)	International Airports / Ports, etc	Tephritidae, Tortricidae
Light Trap Survey	5	May-Oct	Vicinity of International Airports/Ports, etc	Exotic pests (phototactic pests)
Glue Board Survey	190	May-Oct	Imported Plant Planting Houses	Exotic pests (small-sized pests)
Field Survey	-	Year-round (1-2 times a month)	Imported Plant Planting Areas	Exotic pests
Subtropical Moth Distribution Survey	-	Jul-Oct	Islands in West Sea, etc	Subtropical moths
Exotic Weed Distribution Survey	-	Apr-Sep	Along Roads for Transporting Grains, etc	Exotic weeds

I. Trap Survey

The survey period was from May through October (April through October in Jeju). The traps were installed at airports/ports, emergency areas for transfer goods, import/export plant planting areas, areas around fruit markets, isolated cultivation areas, non-commercial orchards, private gardens, and areas around foreign army bases.

1) Attractants and Traps for Each Target Pest

Pests	Attractants	Type of Trap
Ceratitis capitata	Capilure	Steiner Trap, Jackson Trap
Oriental fruit flies (Bactrocera dorsalis)	Dorsalure	Same as above
Cucumber fruit flies	Cuelure	Same as above
Other fruit flies	Proteinlure	Mcphail Trap
Cydia pomonella	Pheromone	Pheromone Trap, Delta Trap

2) Frequency of Survey

Pests were collected every two weeks for the survey.

3) Survey Results

Attractant	Target Pests	Type of Trap	Collected Pests	
			Species	Number (Number of Pests)
Total	5 species		11 species	694 times (38,069)
Capilure	Ceratitis capitata	Steiner Trap	Bactrocera scutellata	9 times (62)
Cuelure	Cucumber fruit flies	Steiner Trap	Bactrocera scutellata Bactrocera depressus	440 times (36,776) 1 time (2)
Dorsalure	Bactrocera dorsalis	Steiner Trap	Bactrocera scutellata	15 times (69)
Protein Hydrolysate	Other fruit flies	McPhail Trap	Bactrocera scutellata Acidiella maculata Bactrocera depressus Other (5 species) Euprosopia grahami	116 times (716) 8 times (27) 8 times (12) 5 times (10) 26 times (120)
Pheromone	Cydia pomonella	Delta Trap	Aterpia issikii Homona magnanima Eucosma metzneriana Other (8 species)	41 times (229) 4 times (5) 13 times (26) 8 times (15)

II. Light Trap Survey

The survey took place from May 1 through October 31 and the traps were installed as follows:

Table 2. Number of Light Traps Installed around Airports/Ports

Total	Incheon Airport	Yeongnam	Jungbu	Honam	Jeju
5 traps	1	1	1	1	1

1) Survey Method

First, the survey was conducted by turning on the light at sunset and turning it off in the morning. Second, the cotton swab dipped in the pesticides was placed in the collection container and replaced every two weeks. Third, the pests were collected every once a week to survey pests in Tortricidae, Gelechiidae, Curculionidae, and Chrysomelidae.

III. Glue Board Survey

The survey was carried out from May 1 through October 31. The glue boards were installed primarily in greenhouses for cultivating imported plants and when there is no proper place, they were installed inside greenhouses cultivating export plants, horticulture, and vegetables

Table 3. Number of Glue Boards Installed

Item	Total	Yeongnam	Jungbu	Seoul	Honam	Jeju	Technical Development Center
Places (Number of Glue Boards)	95 (190)	33 (66)	16 (32)	14 (28)	17 (34)	11 (22)	4 (8)

1) Survey Results

During the survey capturing 33 species of pests, including garden thrips, western flower thrips, palm thrips, and Muscina japonica, 15,579 pests were captured 699 times. Among them, western flower thrips were captured most often (150 times).

IV. Field Surveillance

The surveillance period was from January through December; it was performed at least once a month from January to February and from November to December, and at least twice a month from March through October. The fileld surveillance was conducted at airports/ports, emergency areas for transfer goods, isolated cultivation areas, and import/export plant planting areas for the surveillance.
The following table shows the surveillance guidelines of major pests. Refer to the guidelines for similar pests if certain pests are not on the lists.

Table 4. Pests, Target Plants, and Time of Surveillance

Pests	Target Plants	Time (Month)
Fruit flies, Cydia pomonella, Cydia funebrana, Grapholita inopinata, Neocalyptis liratana, Anarsia lineatella, Plum curculio, etc	Apples, pears, persimmons, grapes, peaches, plums, apricots, walnuts, etc Fruits and vegetables	5~10
Colorado beetles, Globodera rostochiensis, Globodera pallida	Solanaceae (potatoes, tomatoes, eggplants, etc)	4~11
Radopholus citrophilus, Radopholus similis	Tangerines, bananas, flaming flower and other horticultural plants	1~12
Fire blight, witch's broom	Apples, pears	4~9
Synchytrium endobioticum, potato spindle tuber viroid	Potatoes	6~9
Citrus greening disease	Tangerines	5~10
Other exotic pests	Isolated cultivated plants, export/ import plants, etc	1~12

V. Distribution of Subtropical Moths

The investigation period for the distribution of subtropical moths was from July through October. The investigation was performed 2-4 times on subtropical moths before and after windstorms. The investigation regions included Daecheongdo Island and Baengnyeongdo Island in the West Sea, Wando Island and Jindo Island in the South Sea, and other islands. Target pests were subtropical moths, including Metarbelidae, Sphingidae, Geometridae, and Arctiidae, and these moths were collected for classification and identification.

1) Investigation Results

i) Baengnyeongdo and Daecheongdo Islands

In the investigation of these regions three times, 6,453 pests were collected for classification and identification. None of the species were found subtropical.

ii) Wando Island

In the survey of this region two times, 446 pests were collected and 137 species of Lepidopter pests in 13 families were classified and identified. Among them, a number of Lepidopter insects from the southern region, including Avitta puncta, Aurorobotys aurorina, and Myrteta tinagmaria, were discovered.

iii) Jindo

In the survey of this region two times, 415 pests were collected and 130 species of Lepidopter pests in 14 families were classified and identified. Among them, a number of Lepidopter insects from the southern region, including Theretra nessus, were discovered.

VI. Exotic Weed Survey

The survey period was from April through September. The survey was performed at least once a month and conducted at ports of import, lumber yards, bonded warehouses for seeds, slopes, roads for transporting grains, pastures, planting areas for feed, feed plants, and areas around livestock farms. Target weeds were exotic and local weeds (for reference).

Import Risk Analysis

1. Definition of Import Risk Analysis

Pest Risk Analysis (PRA) is defined as “assessing the severity of risk of exotic pests on agricultural crops and natural environments to prevent the economic loss when they are introduced into Korea and developing measures to mitigate the risk (Article 6 of the Plant Protection Act).” Therefore, Import Risk Analysis (IRA) is the process of determinig whether to restrictively allow the importation of prohibited plants (Article 6 of the Plant Protection Act Enforcement Rules) by analyzing the risk of pests that may be introduced through the plants and plant products (commodities) and developing appropriate risk management measures, in case the exporting country officially request for market access of prohibited plants (Article 10 of the Plant Protection Act and Table 1 of its Enforcement Rules).

2. Procedure of Import Risk Analysis

Import Risk Analysis (IRA) basically follows the process of Pest Risk Analysis (PRA) in Article 6 of the Plant Protection Act Enforcement Rules (① Identification of pests, ② Risk assessment, and ③ Risk management). In detail, it takes a total of eight steps including technical risk analysis procedure and administrative rule making procedure for the stability of general procedure related to market access.

I. Filing of Request

1) The exporting country sends an official market access request for the prohibited plants (commodities) which it wants to export.
2) The exporting country submits the basic information needed for IRA. For example, it includes detailed information on target plants, information on production regions and production status, the list of pests that use target plants as hosts, pre-harvest and post harvest phytosanitary practices management, and information on export status.

II. Initiation

1) Review the accuracy and authenticity of the resources submitted by the exporting country.
2) Decide the target commodity of IRA and establish the IRA plan.

III. Pest Categorization

1) Develop a comprehensive list of pests associated with the market access-requeste plants.
2) Review presence or absence of each pest, requlatory status, potential economic consequences by pest, and the history of previous PRA to sort out the pests with potential risks.

IV. Pest Risk Assessment

1) Assess the introduction, establishment, and spread probability of each pest, as well as the its economic consequences.
2) Sort out the quarantine pests with a certain level of risk or higher as pests that require risk management measures.
3) Finalize the risk assessment after risk communication with local/international experts and interested parties, including IRA advisors.[1)]

V. Pest Risk Management

1) For special risk management pests, evaluate the appropriateness and alternatives risk management measures suggested by the exporting country to determine whether to allow importation of target commodity or their conditions for importation.
2) Risk management measures shall be finalized after risk communication with local/international experts and interested parties, including import risk analysis advisors, and the deliberation of plant quarantine deliberation committee.

VI. Draft of Import Requirements

Prepare the draft import quarantine requirements (exclusion from import prohibition) based on the risk management measures.

VII. Public Notice of Proposed Rule

The draft regulation shall be announced through the QIA Homepage (http://www.qia.go.kr).

VIII. Notification and Enforcement

The exclusion from import prohibition shall be notified by QIA through the QIA Homepage (http://www.qia.go.kr).

1) Twenty pests professors were appointed as the second-term IRA advisors to collect expert opinions.

3. 2011 Import Risk Analysis Status

More market access requests are made following globalization and free trade, with the number of items diversifying. The average number of market access requests made every year increased four to 9.7 after 2000. Also, a total of 81 requests were received from 21 countries for 30 items as of 2000, but a total of 155 requests were received from 36 countries for 63 items as of 2011, in addition to what was already permitted for importation.

Table 5. Number of Items on Market Access Requests (cases, as of December 31, 2011)

Country	Number of Items (Cases)	Country	Number of Items (Cases)
South Africa	12 Items (Cases)	Netherlands	9 Items (Cases)
New Zealand	6 Items (Cases)	New Caledonia (France)	1 Item (Case)
Taiwan	8 Items (Cases)	Malaysia	4 Items (Cases)
Mexico	9 Items (Cases)	USA	10 Items (Cases)
Vietnam	7 Items (Cases)	Brazil	6 Items (Cases)
Spain	2 Items (Cases)	Argentina	3 Items (Cases)
Afghanistan	1 Item (Case)	Ecuador	1 Item (Case)
Jordan	1 Item (Case)	Uruguay	1 Item (Case)
Iran	1 Item (Case)	Israel	5 Items (Cases)
Egypt	4 Items (Cases)	Italy	6 Items (Cases)
India	6 Items (Cases)	Indonesia	4 Items (Cases)
Japan	2 Items (Cases)	China	6 Items (Cases)
Chile	6 Items (Cases)	Cambodia	1 Item (Case)
Canada	3 Items (Cases)	Columbia	6 Items (Cases)
Kyrgyzstan	1 Item (Case)	Thailand	1 Item (Case)
Pakistan	3 Items (Cases)	Peru	3 Items (Cases)
Portugal	1 Item (Case)	France	1 Item (Case)
Philippines	3 Items (Cases)	Australia	11 Items (Cases)
Total		**36 countries**	**155 Items (Cases)**

Table 6. Number of Countries Making Market Access Requests per Item (as of Dec 31, 2011)

Item	Number of Countries	Item	Number of Countries
Eggplants	2	Citrus	2
Potatoes	2	Potatoes (seeds)	1
Sweet Potatoes	1	Capsicums	1
Guavas	2	Tamarillo	1
Nectarine	3	Persimmons	2
Pumpkins	3	Durians	2
Dragon Fruits	1	Strawberries	2
Limes	1	Rambutan	1
Lemons	7	Mandarins	5
Satsuma Mandarins	1	King Mandarins	1
Mediterranean Mandarins	1	Mangos	13
Mangosteens	1	Melons	4
Pears	6	Peaches	3
Blueberries	2	Apples	8
Apricots	2	Salak	1
Pomegranates	4	Pine (Lumber)	2
Sweet Limes	1	Sweet Passion Fruits	1
Star Apples	1	Avocadoes	4
Sweet cherry	2	Lychee	3
Yellow Passion Fruits	1	Oranges	1
Oranges (3 species)	1	Cucumbers	1
Okra	1	Longan	2
Indian Dates	1	Plums	3
Grapefruits	8	Zucchini	1
Carambola	2	Cape Gooseberries	1
Clementine	1	Kiwis	3
Tangor	1	Tangerines	3
Tomatoes	3	Pineapple Guavas	1
Papayas	5	Paprika	1
Persian Limes	1	Pomelo	1
Grapes	9	Bell Peppers	1
Walnuts	2		
Total		**63 items**	**155 countries**

In 2011, additional market access requests were received for salak/avocado from Indonesia (Jun), avocado from the Philippines (Jun), squashs from New Caledonia (France, Jul)from Mexico (Sep), and star apples from Vietnam (Nov). Through IRA of country, item, and procedure, market access was permitted for potatoes from New Zealand (Feb), grapes from Peru (May), blueberries from USA (Oregon, Sep), and oranges/grapefruits from Israel (Nov).

04

Sanitary Management and Safety Inspection of Livestock Products

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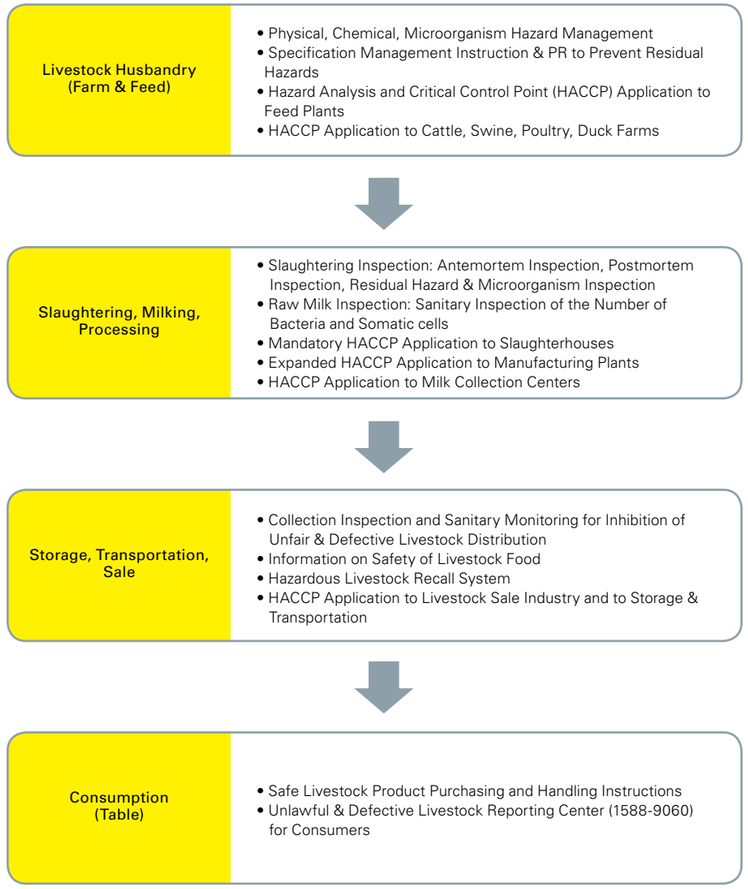
1. Introduction

The purpose of sanitary management of livestock products is to pursue sound development of livestock industry and livestock processing industry and to contribute to the improvement of public sanitation through sanitary management and quality improvement of all steps from slaughtering, disposal to production, processing, distribution, and sale. Our goal is to earn consumer trust on the safety of livestock products through consistent sanitary management from livestock husbandry to consumption. In order to supply safe livestock products, professional and systematic sanitary management is required 'from Farm to Table', which involves the following items:

Figure 1. Step-by-step Livestock Sanitary Management



2. Arrangement of Major Regulations on the Sanitary Management of Livestock Products

In 2011, the National Veterinary Research & Quarantine Service, mainly responsible for livestock safety/sanitary management, integrated with the National Plant Quarantine Service and the National Fisheries Products Quality Inspection Service to launch as the Animal, Plant, and Fisheries Quarantine & Inspection Agency (QIA), completely reenacting and revising the notifications related to the 「Livestock Product Sanitary Management Act」.

I. Enactment of Specific Inspection Standards for Slaughtered Animals and Meats (QIA Notification No. 2011-101, Jul 29, '11)

The notification was enacted to stipulate the details pertaining to the inspection standards of slaughtered animals and their meats pursuant to Article 9 Item 3 and [Table 3] Item 3 of the 「Livestock Product Sanitary Management Act」 Enforcement Rules to unify the responsibilities of inspectors and responsible veterinarians certified for slaughter inspection. This notification specified the detailed standards and methods of antemortem and postmortem inspection and lab test, and the processing methods of rejected items.

II. Revision of Manufacturing Standards and Specifications of Livestock Products (QIA Notification No. 2011-105, Oct 12, '11)

QIA Notification No. 2011-105 specified the inspection targets to clarify the food preservative and antioxidant targets and added hair and bones that are not completely removed in normal processing and manufacturing to improve the standards for non-metal impurities. Other amendments included the specification of temperature range for edible eggs, the revision of exclusions applied to sterilization of heated/unheated processed meat, the addition of edible egg sale industry to livestock expiration period, the revision of examples of applicable items in the definition of ground meat products, and the revision of sorting out inedible eggs based on organoleptic test.

III. Revision of Labeling Standards for Livestock Products (QIA Notification No. 2011-110, Dec 23, '11)

In 2011, the directions were required to be identified on miscellaneous labeling using a font size larger than 8 and with a specific example of calories. For products with no standard amount per serving, calories could be omitted. There were also provisions to omit the name of producer on the smallest unit of packaging and to follow the standards for the labeling of nutritional values to use numbers instead of characters when labeling the name of producer in symbols. The new grade labeling system for packed meat was required to show all available grades on the package sold to end consumers and label the corresponding grade. The labels for processed dairies were improved to match the standard labeling systems for food on the 「Food Sanitation Act」 and the provisions were partially improved by considering the new social needs and the existing notifications for safe management of livestock products.

IV. Revision of Designation of Livestock Sanitary Agencies and Operation Guidelines (QIA Notification No. 2011-109, Nov 17, '11)

As the "Manufacturing Standards and Specifications of Livestock Products (QIA Notification)" added Korean beef testing method (microsatellite market method and single nucleotide polymorphism method) to special inspection methods among the edible meat methods with the revision of 2008, private livestock sanitary agencies could add Korean beef tests to their checklist.

V. Revision of Livestock HACCP (QIA Notification No. 2011-111, Dec 30, '11)

Figure 2. New HACCP Mark

Previously, there were various certification systems for Korean livestock products, including HACCP, antibiotic-free and organic livestock products with each system using a unique mark, causing inconvenience for consumers to understand several marks for a single livestock product. In 2011, the related provisions were revised to unify the different marks of the certification systems for easier comprehension of consumers.

3. Implementation of the Hazard Analysis Critical Control Point (HACCP) System of Livestock Products

The HACCP system is a scientific and systematic preliminary sanitary management system that analyzes the hazards in raw ingredients and manufacturing process that may have harmful impacts on livestock products (hazard analysis) and manages critical control points (CCP) to eliminate all hazards in final products to produce and distribute safe and sanitary livestock products.

I. HACCP Application to Feed Plants

From March 2009 through December 31, 2011, 88 formula feed plants out of 98 plants had acquired HACCP certification. Also, TMR feed plants promoted HACCP certification and three plants were certified as of December 31, 2011. Since March 2009, the Ministry for Food, Agriculture, Forestry, and Fisheries (MIFAFF) has been responsible for certifying feed plants for HACCP and providing Livestock HACCP Services.

II. HACCP Application to Farms

HACCP application gradually expanded to swine farms in 2006 (animal husbandry), cattle farms in 2007, poultry farms in 2008, and duck farms in 2009, and similar assessment standards were established for quail farms (unnoticed item) in 2011. As of December 31, 2011, the number of certified sites was 1,539 animal husbandry sites for cattle, 657 for swine, 595 for poultry, 53 for ducks, and 2 for quails.

III. HACCP Application to Slaughterhouses and Milk Collection Centers

MIFAFF revised the Processing of Livestock Products Act in December 1997 to apply HACCP to slaughterhouses, and a total of 140 sites had been certified as of December 31, 2011. The number of certified slaughterhouses by year was 57 in 2002, 107 in 2003, 127 in 2004, 137 in 2005, 141 in 2006, and 146 in 2007, but the number was reduced to 145 in 2008, 143 in 2009, 142 in 2010, and 140 in 2011. The HACCP for milk collection centers began on November 27, 2007 and 27 sites have been certified as so far.

Table 1. HACCP Certified Slaughterhouses in 2011

Category	Cattle & Swine	Poultry	Duck	Total
Dec 31, '09	90 sites	41 sites	12 sites	**143 sites**
Dec 31, '10	89 sites	41 sites	12 sites	**142 sites**
Dec 31, '11	88 sites	41 sites	11 sites	**140 sites**

IV. HACCP Application to Livestock Handling Sites

As of December 31, 2011, a total of 1,724 sites were certified, and the number of certified sites by year recorded 51 in 2002, 61 in 2003, 175 in 2004, 278 in 2005, 437 in 2006, 597 in 2007, 814 in 2008, 976 in 2009, and 1,476 in 2010.

HACCP was first applied to livestock sale industry (edible meat) on November 27, 2006, to livestock storage and transportation in December 2007, and to edible egg sale industry in December 2010. So far, 332 edible meat sellers, 27 livestock product transportation businesses, 6 livestock storage businesses, and 13 edible egg sellers have been certified.

Table 2. HACCP Certified Livestock Sites in 2011

Total	Livestock Sites							
	Dairy processing	Meat packaging	Meat processing	Egg processing	Meat selling	Edible egg selling	Livestock storage	Livestock transport
1,724	71	945	298	32	332	13	6	27

V. Expansion and Verification of HACCP Application

HACCP standards were suggested (2010) for unnoticed items without assessment standards similar to notified items for the convenience of petitioners who wish to autonomously operate HACCP, and the HACCP application chart was developed and added in 2011 to apply HACCP to animal husbandry of quails, an unnoticed item. In 2011, the certification was expanded to 38 slaughterhouses, 4 dairy manufacturing plants, 5 meat packing industries, and 12 edible meat sellers. The certification was mostly implemented to investigate the unsatisfactory items of HACCP to improve the system and amend notifications and the verification targets were mostly business reported by press or emerging as social issues. When verifying the businesses, HACCP technical advice was provided to suggest improvement measures and regular sanitary management training was scheduled to address complaints. In particular, special HACCP training was scheduled for edible meat sellers and related organizations to address the issues that were not properly resolved through onsite technical instructions.

VI. Professional HACCP Training in Korea and Abroad

For consistent development and expansion of HACCP system in Korea, 144 regular HACCP training sessions were provided for 7,434 people by HACCP agencies: Korea Food Research Institute, Korea Livestock Products HACCP Accreditation Service, etc. This showed a 26.3% increase in sessions and a 22.0% increase in the number of trainees compared to 2010. In relation to Samgyetang (ginseng chicken soup) exportation, regional officers were trained about the U.S. regulations through six TF team meetings to support HACCP sanitary technology, nurture government-certified experts, and establish relevant infrastructure.

As a part of international and advanced HACCP training and education, HACCP training by the EU Directorate-General for Health and Consumers (UK DG SANCO, Jul 11-15, 1 officer) was offered and the slaughterhouse management systems were improved by sharing advanced slaughter inspection technologies. In detail, training at the German government and plants (Jul 26-Jul 9, 2 officers) and short-term department-customized international training programs were offered for equivalence evaluation experts training and HACCP government certification system techniques (U.S. FSIS, Sep 18-Oct 2, 6 officers in 2 teams) to acquire skills and government certification information for the development of HACCP systems.

VII. International HACCP Expert Invitation Seminar

By expanding and revitalizing HACCP for livestock products, the 'from farm to table' system was completed from animal husbandry to sale, and HACCP experts were invited from the U.S. for seminars to build a foundation for HACCP system, gather opinions from experts and industries, and seek improvement possibilities for HACCP assessment systems for the livestock industry. The seminars were held on the subjects of the U.S. CFR and other regulations, the U.S. HACCP and other sanitary management regulations and amendments, and the method of government certification, and a total of 362 persons attended the seminars from July 18 through July 22 (5 days). The seminars also involved onsite technical advice for potential exporters through a field workshop on July 21 (1 day) along with lectures. Finally, future export measures were discussed for the FSIS audit through validity assessment and EIAO and for the progress of equivalence assessment and future response measures. Seminar books, HACCP site government certification manuals and HACCP notification booklets for HACCP evaluators were published and disseminated (600 copies, July).

Considering the need to promote sanitary/safety cooperation projects for livestock products following the Korea-ASEAN FTA, the Asian Livestock Safety Management Seminar (Oct 12-Oct 22, 14 countries, 26 attendees) was held to introduce Korea's livestock product safety management policies and HACCP systems to the world to ensure reliability of the safety of Korean livestock products and establish foundation for exporting the products.

4. Sanitary Management Guidelines and Collection Inspection on Livestock Establishments

I. Regulation and Sanitary Monitoring of Unlawful & Defective Livestock Products (QIA)

To ensure safety of imported livestock products and improve sanitary management, special sanitary inspection was performed on 340 livestock product importers and sellers from April 27 to May 8 and from November 2 to November 27 and 11 defective establishments were exposed and subjected to administrative measures.

Special inspection for preventing unlawful/defective livestock product distribution was scheduled for peak seasons with increasing livestock product consumption (New Year's (Jan 17-Feb 1), Chuseok (Aug 29-Sep 9), and end of year (Dec 7-Dec 30)). A total of 140 establishments were inspected for special monitoring before the New Year's and nine violations were discovered at eight industries. Major violations included selling products past shelf life, failure to operate Sanitation Standard Operating Procedures (SSOP), and violation of preservation and distribution standards. In the special monitoring before Chuseok, 233 industries were inspected to discover 30 violations in 29 establishments. Major violations included selling products past shelf life, unsanitary management of livestock products, and no sanitary training and health examination for employees. In the special monitoring at the end of the year, 118 establishments were inspected to discover 20 violations in 16 establishments. Major violations included violation of prohibited sale, violation of Sanitation Standard Operating Procedures (SSOP), violation of labeling for edible meat, and no sanitary training and health examination.

To ensure sanitation and safety of livestock products popular among children, including hams, sausages, and cheese, 197 establishments, including the producers of children's favorite livestock products, were monitored from Mar 8 to Apr 29 to discover 34 violations in 31 establishments, and major violations included failure to report manufacturing items, violation of labeling standards, products stored past shelf life for sale, and violation of preservation and distribution standards.

To prevent food poisoning from meal services in schools, two special monitoring sessions (May 2-Jul 24, Oct 10-Nov 4) took place for establishments that produced, distributed, or sold livestock products. In the first session, 247 establishments were inspected to discover 32 violations in 31 establishments; in the second session, 167 establishments and 32 violations in 31 establishments. Major violations included selling products past shelf life, violation of preservation and distribution standards, and failing to prepare transaction statements and raw ingredient logs.

To supply safe and sanitary livestock products, special monitoring was performed for perishable livestock products that are largely consumed in summer. Ice cream and marinated meat producers were inspected (Jul 4-Aug 26) to discover 50 violations in 48 out of 335 establishments monitored. Major violations included selling thawing frozen meat, false labeling of packing date, failing to operate Sanitation Standard Operating Procedures (SSOP), and storing products past shelf life for sale.

5. Livestock Products Processing Standard & Component Specification Inspection and Microorganism Management

I. Laboratory Tests of Imported Manufactured Livestock Products

A total of 15.4% (3,000 cases) were inspected out of 19,454 reported imports; laboratory tests were applied to 6.2% (1,210 cases) of all imports (19,454 cases), including the initial imports, and random sampling inspection was applied to 9.8% (1,790 cases) of all applicable items (total imports minus the 1,210 cases of laboratory tests: 18,244 cases). As a result, 55 cases (1.8%) of inspected items (3,000) were rejected due to excess E. coli or preservatives. As a part of livestock product inspection, there were 98 cases of melamine inspection and 184 cases of radioactive inspection [136 cases in 30 countries including East Europe; 136.0% of targets (100 cases) and 48 from Japan due to the nuclear incident in Japan] and all passed the inspection.

II. Microorganisms in Imported and Domestic Meat

There were a total of 1,938 cases of imported meat monitoring inspection (E. coli O157:H7, salmonella, and listeria monocytogenes) and listeria monocytogenes were found in three cases. Also, there were 3,685 cases of exploratory inspection of imported meat (8 species, i.e., Campylobacter). As a result, 125 cases of Staphylococcus aureus and two cases of Campylobacter were discovered. Among the 3,962 cases of exploratory inspection of local meat (11 species, i.e., salmonella and listeria), there were 101 cases of Staphylococcus aureus, 24 cases of salmonella, 18 cases of Clostridium perfringens, 37 cases of Campylobacter, and 16 cases of E. coli.

Table 3. Exploratory Inspection of Local Meat in 2011

[Unit: No. of Samples (No. of Samples Detected/No. of Samples Inspected)]

Item	Cases Planned for Year	Beef	Pork	Chicken	Duck	Total
E. coli O157:H7	150	80	100	60	10	250
Salmonella spp.	450	1/152	2/150	21/130	20	24/452
L. monocytogenes	450	152	150	130	20	452
Sta. aureus	450	9/152	23/150	56/130	13/20	101/452
Clo. perfringens	450	5/152	150	13/130	20	18/452
Campylo. jejuni	450	152	150	7/130	10/20	17/452
Campylo. coli	450	152	3/150	17/130	20	20/452
Y. enterocolitica	150	80	100	60	10	250
E. coli O26	150	1/80	1/100	10/60	10	12/250
E. coli O111	150	80	1/100	60	10	250
E. coli O128	150	4/80	100	60	10	4/250
Total	3,450	20/1,312	30/1,400	124/1,080	23/170	197/3,962

Table 4. Monitoring and Exploratory Inspection of Imported Meat in 2011

[Unit: No. of Samples (No. of Samples Detected/No. of Samples Inspected)]

Item	Cases Planned for Year	Beef	Pork	Chicken	Duck	Total
E. coli O157:H7	600	160	260	226	646	Monitoring Inspection
Salmonella spp.	600	160	260	226	646	
L. monocytogenes	600	160	3/260	226	3/646	
Sta. aureus	600	17/159	58/260	50/226	125/645	Exploratory Inspection
Clo. perfringens	280	140	209	91	440	
Campylo. jejuni	280	140	209	2/91	2/440	
Campylo. coli	280	140	209	91	440	
Y. enterocolitica	260	130	209	91	430	
E. coli O26	260	130	209	91	430	
E. coli O111	260	130	209	91	430	
E. coli O128	260	130	209	91	430	
Total	4,280	17/1,579	61/2,503	52/1,541	130/5,623	

III. Monitoring Inspection of Manufactured Livestock Products Containing Genetically Modified Food

The inspection of 106 cases of domestic meat products found all products to meet the labeling standards.

IV. Korean Beef Identification Monitoring of Beef Distributed in Korea

As a result of inspecting 100 Korean beef and imported beef distributed in Korea, all products satisfied the country of origin labeling standards.

V. Other Inspections Related to Unlawful & Defective Livestock Products

In relation to unlawful/defective livestock products currently distributed in Korea, 14 products were chosen for laboratory tests, including soft cheese, manufactured milk, and baby formulas, and all products were satisfactory. The monitoring of radioactivity of 463 cases of Korean livestock products (161 cases of milk and 302 cases of meat) in relation to the safety inspection of livestock hazards or issues following the nuclear plant incident in Japan, found that all products were satisfactory (no hazards). The monitoring of formaldehyde of 99 samples from milk products sold in the Korean market following the report on milk from cows fed with feed containing formaldehyde found that all products were satisfactory within the range of natural generation (0.004-0.023ppm).

VI. Standardization of Raw Milk Inspection

1) Production and Supply of Raw Milk Inspection Standard Reagent

A total of 6,912 (12 times) bottles in 2,304 sets of raw milk inspection standard reagent was distributed to 12 raw milk inspection agencies (dairy contents, number of somatic cells, and number of bacteria) and 2,409 (11 times) bottles in 803 sets to milk cow inspection agencies (dairy contents and number of somatic cells).

2) Standardization of Inspection Equipment of Raw Milk Inspection Agencies

The inspection of milk fat, number of bacteria, and number of somatic cells for 12 raw milk inspection agencies found that all 12 agencies were satisfactory (1st and 2nd sessions); According to the inspection of the operation of raw milk inspection agencies, all agencies followed the milk collection and raw milk inspection standardization guidelines.

3) Milk Collection and Raw Milk Inspection Performance Report

The inspection of a total of 74,532 farmhouses and 1,900,000 tons of raw milk found that 445 farmhouses (0.60%) and 492 tons of milk (0.03%) were unsatisfactory. Major issues were residues, alcohol, and contents. Also, grade 1 milk in terms of the number of bacteria accounted for 85.5% of farmhouses and 88.6% of raw milk and grade 1 milk in terms of the number of somatic cells for 46.1% of farmhouses and 48.9% of raw milk.

4) Maintenance/Repair Agreement and Comparative Inspection for Maintaining Raw Milk Inspection Equipment

The maintenance/repair agreement included provisions on maintaining/repairing three inspection equipment units, including bacteria tester, somatic cell/dairy content analyzer, and milk analyzer, at least once a month and performing international comparative inspection using the U.S. ELS standard reagent to measure the accuracy of equipment. Also, comparative inspection of three agencies (Gyeonggi-do and Chungcheongnam-do) was performed before supplying standard reagent to minimize standard deviation to improve accuracy and efficiency of local raw milk inspection agencies.

5) Training/Workshop for Raw Milk Inspector/Assistant and Raw milk Inspection Booklet

For the standardization of raw milk inspection of 12 raw milk inspection agencies and 24 raw milk certifiers nationwide, workshops were offered for raw milk inspectors/assistants and certifiers and a booklet on the improvement of milk quality and raw milk inspection was published and disseminated.

VII. Technical Training for Inspection Methods

1) Training for Manufactured Livestock Product Inspection Team

Lecture and practice training on physico-chemical (May 16-May 20) and microorganism (Jul 11-May 15) inspection methods of manufactured livestock products were offered for 20 sanitary inspection officers from each city and provincial sanitary inspection agency for livestock products.

2) Training for Laboratory Tests of Manufactured Livestock Products

Field training of analytical technology (Nov 10) was provided for local inspectors, physico-chemical and microorganism practical training for college students (Jul 11-Aug 5), and field practice and training for local inspectors on the standards and microorganism inspection of Samgyetang exports to the U.S. (Apr 13, Apr 21-21, and Jul 12-13).

3) Internationally Accredited Testing Agencies

Since obtaining the certificate ('05) from Korea Laboratory Accreditation Scheme (KOLAS) on the inspection (physico-chemical and microorganism) of livestock products, we have been recognized as an internationally accredited testing agency for livestock products through field assessment of special post-management (Dec 15-16).

4) International Performance Assessment Certification on Livestock Products Inspection

As an internationally accredited testing agency, we participated in the international performance assessment programs (FEPAS, FAPAS, RIKILT) to operate a standardized laboratory and acquired outstanding certification on seven physico-chemical areas, including nitrite ions; two microorganism areas, including qualitative test of salmonella; and all residue areas of veterinary medicinal products (VMPs).

6. Inspection Management of Harmful Chemical Residues in Livestock Products

I. Inspection of Residues in Imported Meat

Residue tests of imported meat for reported imports designated by the Automated Import Information System (AIIS) were conducted by Seoul and Yeongnam regional offices. The major target items (96) were frequently detected residues or highly harmful substances for focused inspection and other substances (84) were inspected for monitoring. Among the 68,321 cases of imported meat reported in 2011, residues were tested for 7,634 cases, which were 11.2% in average. Among them, three cases (0.04%) exceeded the permissible level of residues; in detail, two cases of U.S. pork and one case of pork from Poland were rejected due to Sulfamethazine and Doxycyline.

Table 5. Residue Inspection for Imported Meat (Unit: Cases)

Item	Reported Imports	Inspection	Rejected	Remarks
Fresh Beef/Carcasses	23,187	1,483	-	
Beef Byproducts	10,531	684	-	
Fresh Pork/Carcasses	19,300	2,828	3	2 U.S., 1 Poland
Pork Byproducts	11,381	2,111	-	
Fresh Chicken/Carcasses	3,158	467	-	
Chicken Byproducts	73	9	-	
Turkey Meat	62	4	-	
Duck Meat	101	8	-	
Lamb Meat	463	36	-	
Goat Meat	65	4	-	
Deer Meat	-	-	-	
Other Meat	-	-	-	
Total	**68,321**	**7,634(11.2%)**	**3(0.04%)**	

II. Residues in Domestic Meat

For residues in domestic meat, 17 local sanitary agencies for livestock products across Korea inspected 134 kinds of substances, including antibiotics, synthetic sterilizers, hormones, and pesticides, in beef, pork, chicken, duck, lamb (goat) and horse meat. A total of 127,600 bodies were inspected through monitoring and regulation tests. In monitoring inspection, 100,820 bodies were sampled at slaughterhouses nationwide and 92 bodies (0.09%) were rejected. The regulation tests of 26,780 bodies suspected for residues, such as animals from farmhouses with previous violations and urgent slaughters, found 70 violations (0.26%) with about 11.8 tons of residues. The violation rates resulting from monitoring and regulation tests were 0.10% for cattle, 0.16% for swine, and 0.10% for poultry with an average of 0.13%, which was lower than 0.15% from 2010 and 0.16% from 2009.

Table 6. Residue Inspection for Domestic Meat (Unit: Violation/Inspection Case, %)

Item	Cattle	Swine	Poultry	Duck	Lamb (Goat)	Horse	Total
Regulation Test	41/13,487 (0.30)	29/12,434 (0.23)	0/737 (0.0)	0/124 (0.0)	-	-	**70/26,782 (0.26)**
Monitoring	5/31,938 (0.02)	66/48,640 (0.14)	21/17,729 (0.10)	0/2,052 (0.0)	0/212 (0.0)	0/735 (0.0)	**92/101,306 (0.10)**
Total	**46/45,425 (0.10)**	**95/61,074 (0.15)**	**21/18,466 (0.11)**	**0/2,176 (0.0)**	**0/212 (0.0)**	**0/735 (0.0)**	**162/128,080 (0.13)**

III. Technical Training and Quality Control for Residue Analysis of Sanitary Inspection Agencies

In order to induce standardization of residue analysis technologies for livestock products sanitary inspection agencies and improve the reliability of inspection, technical trainings on residue analysis of new inspection targets were offered, including two sessions of livestock residue inspector training program (April, October) by the Training Institute for Food, Agriculture, and Fisheries.

To improve residue analysis capacity of sanitary inspection agencies and standardize inspection, the quality control test of laboratory residue tests were offered to Seoul/Yeongnam regional offices, 19 local agencies, and four private businesses. The test results on 28 types of residues in three lines, including sulfurs, tetracycline, and quinolone, showed that all 20 agencies detected these substances during the primary inspection and the concentration of these substances was within the permissible level of accuracy and precision recommended by CODEX. One agency that did not show up was required to submit a report and two partially unsatisfactory agencies were encouraged to improve their analysis capacities through independent cause investigation, training, and reassessment.

We have made every effort to ensure the safety of domestic and imported livestock products by conducting hazard analysis of substances of safety concerns at home and abroad and reflecting the results in the inspection plans through support from various groups such as 「Residue Research Society」, and developing inspection measures for substances with new residue permissible levels.

7. Designation, Guidance and Supervision of Sanitary Inspection Agency for Livestock Products

I. Designation of Livestock Sanitary Inspection Agency

In 2011, a total of two agencies were newly designated - Korea Analysis Research Institute and Eco Bio Korea Co., Ltd. - and four agencies were withdrawn. As of December 31, 2011, 26 private agencies were designated.

II. Proficiency Test of Livestock Sanitary Inspection Agency

The proficiency test for 42 livestock sanitary agencies (23 private and 19 government) in terms of physico-chemical (crude fat, one type of preservative, one type of antioxidant, and nitrite ions) and microorganism areas (number of bacteria, number of E. coli, number of E. coli strains, and four types

of food poisoning bacteria) found that 37 agencies were satisfactory and two were unsatisfactory in physico-chemical areas and 36 agencies were satisfactory and six were unsatisfactory in microorganism areas. Unsatisfactory agencies were provided the inspection method training and retested to be found satisfactory. Twenty three agencies (4 private and 19 public) were evaluated for 28 types of residues in three lines, including sulfurs, tetracycline, and quinolone, and the results were 20 satisfactory, one absent, and two unsatisfactory. The absent agency was required to submit a report and unsatisfactory agencies were instructed to analyze the causes and were given training and technical instructions.

III. Inspection of Livestock Sanitary Inspection Agency

To investigate the operation of livestock sanitary agencies and unlawful activities, the general inspection is being conducted on a yearly basis to ensure the standardization and reliability of the agencies. In 2011, 24 private agencies were inspected. Also, 10 independent quality control agencies (manufacturers) were inspected for the validity of their quality control.

8. Establishment of Imported Beef Traceability System

The Imported Beef Traceability System has been implemented since December 22, 2010 to report/record transaction history in all distribution stages of imported beef from import to sale, conduct fast recall in case of hazards, and provide trace information to consumers.

Imported beef establishments are electronically reporting and managing transaction history and operating the Traceability System (www.meatwatch.go.kr) for any consumer to access trace information of imported beef, including the country of origin and shelf life. To expedite this system, training was provided for establishments in each district 249 times (2,980 people) and 2,682 establishments were inspected for better management of transaction reports/records. Also, a call center (five consultants) was operated to respond to 46,000 calls related to the system.

We have also promoted the system using video/screen door advertisements on public transportation, including subways and buses, and banners on portal sites and search engines. Also, Imported Beef Traceability System experience events were held for consumer organizations four times (176 people) to help consumers better understand and increase access to the system.

9. Technology Development and Risk Assessment of Livestock Sanitation

Following the nuclear incident in Japan, it was necessary to review the radioactive standards of livestock products through scientific hazard assessment to ensure their safety. After Korea Food and Drug Administration conducted review on new radioactive iodine standards in baby food, a hazard assessment was performed on radioactive iodine in livestock products to review the standards of baby food including milk and dairy products. Also, a hazard assessment was performed to provide basic data to revise the standards for *L. monocytogenes* in manufactured dairy products, and *S. aureus* and *L. monocytogenes* in hams/sausages.

We developed alternative toxicity assessment methods using new technologies like stem cell technologies; conducted hazard assessment on livestock products consumed by vulnerable consumers, like infants affected by the melamine-contaminated formula; developed rapid detection method of molds using nano particles (internationally collaborative); and analyzed the impact of chemicals in livestock products on genetics to prioritize the hazards of veterinary medicine in livestock products (3 species, 227 matters); performed quantitative hazard assessment on residual environmental pollutants (dioxins) in livestock products; developed method of purifying mycotoxin in samples using antibodies and magnetic nano matters developed for three kinds of mycotoxins and animal alternative toxicity test model to easily assess genetic impacts in in-vitro and in-vivo tests; conducted the toxicity and residue assessment of veterinarian medicinal products permitted in Korea and the hazard assessment of harmful substances of new concerns (formaldehyde in milk).

10. Education and Promotion on Livestock Sanitation

In 2011, regional information sessions (five times: May 23, May 26, Jun 1, Jun 2, and Jun 8) on livestock safety management (labeling, monitoring, and specifications) were performed for the understanding of business owners and government officials on the most frequent questions about the revised relevant regulations and to exchange information on future management plans. Also, we held an international expert invitation seminar (Nov 15-16, 39 people) on international inspection management systems for manufactured meat products and food poisoning bacteria management measures, and locally held expert invitation seminars on sampling method for food microorganism hazard assessment (Apr 12, 26 people), food poisoning bacteria inspection methods (May 26, 25 people), and meat identification method and improvement measures (Jun 16, 28 people). Other events included a dairy manufacture plant experience event with consumers (Dec 9, 35 people) and a livestock food industry development symposium (Nov 30, 100 people) to share opinions with industrial, academic, and consumer organizations and to discuss local livestock standards and development directions for livestock food to meet the needs of consumers. For the standardization of raw milk inspection, we published and disseminated operating manuals and held a workshop on quality improvement and raw milk inspection (Oct 5, 102 people). We promoted joint training sessions with cities/provinces (8 sessions, 709 people) to improve the capacities and raise sanitary awareness of honorary livestock sanitary inspectors and invited consumer organization members and general consumers of imported beef to experience the field operating the Imported Beef Traceability System (4 sessions, 176 people) to ensure the transparency of livestock food distribution management. Finally, we held a symposium on animal disease models and alternative test methods (Aug 23) to introduce the latest research trends on alternative methods for toxicity and animal tests and to promote the application of the latest alternative methods to the toxicity tests of harmful chemicals.

05

Country of Origin Labeling and Quality Control of Fishery Products & Safety Control of Domestic Fishery Products

Country of Origin Labeling Management

1. Overview
2. 2011 Major Task Results
3. Country of Origin Labeling of Fishery Products in Restaurants

Quality Control

1. Introduction
2. Need for Government Certification System of Fishery Products
3. Status of Quality Certification System of Fishery Products
4. Integrated Management of Certification System Marks for Agro-Fishery, Livestock and Forestry Products

Safety Control of Domestic Fishery Products

1. Introduction
2. 2011 Safety Inspection Status

Country of Origin Labeling Management

1. Overview

I. Purpose

The purpose is to provide appropriate and reasonable country of origin labeling for fishery products (including salt) or manufactured fishery products, protect consumers right to know and encourage fair trade to protect both producers and consumers.

II. Related Legal Basis

Related legal basis include Article 5 of the 「Act on Country of Origin Labeling of Agro-fisheries Products」, Article 33 of the 「Foreign Trade Act」, Article 5 of the 「Act on the Persons Performing the Duties of Judicial Police Official and the Scope of Their Duties」, and 「Country of Origin Labeling of Agro-fisheries Products Guidelines (Ministry for Food, Agriculture, Forestry and Fisheries Notification No. 2011-86, Jun 15, 2011)」.

III. Progress

The country of origin labeling system for imported fishery products was introduced under the 「Foreign Trade Act」 on January 1, 1994, which laid a foundation for the development of the country of origin labeling system for local fishery products (Jan 1, 1995) and manufactured fishery products (Jan 1, 1996). Later, legal systems were established for six kinds of edible fishery products for transplantation (Jan 1, 2009) and edible salt (Aug 11, 2010).

IV. Items Subject to Country of Origin Labeling and Labeling Standards

1) Items Subject to Country of Origin Labeling

Table 1. Items Subject to Country of Origin Labeling

Item	Total	Local Fishery Products	Pelagic Fishery Products	Manufactured Fishery Products	Imported Fishery Products	Salt
No. of Items	253	191		37	19	6
Label		Korean, Local or From Coastal Waters	From Deep Sea or From Deep Sea (name of ocean)	Country of origin of ingredients used	Name of country (country of origin during customs clearance)	Name of country or region

2) Labeling Standards

For fishery products (including salt) that are packed for sale, labeling is printed on the package or attached as stickers or labels from an electronic scale. For fishery products (including salt) that are sold unpackaged, labeling is attached as tags or on stickers, signs, or containers.

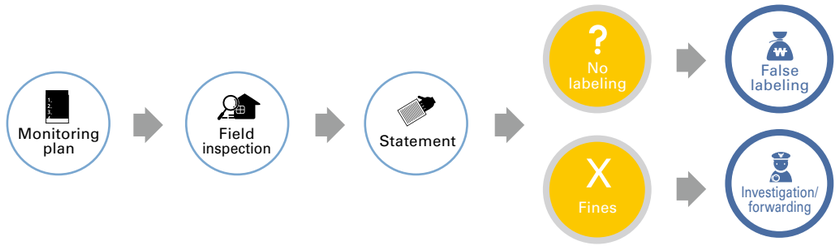
Also, live local and imported fishery products, i.e., live fish, should be sold separately in fish tanks and labeled by signs.

V. Monitoring and Measures for Violations

1) Monitoring Teams and Procedure

Each regional office organizes a team of 2-3 fishery product monitoring officers (total of 255 officers as of the end of Dec 2011) to monitor illegal distribution, civil reports and major violations. These teams should be operated as allowed by each local headquarters/office.

The monitoring procedure is as follows: organizing monitoring team and planning → tracking violations and distribution process of target businesses → entering violators into computer system → investigating false labels and imposing fines on violators with no labels → receiving petitions against fines (15 days) → reporting investigation results to the public prosecutor and imposing fines on no labels → disclosing violators on the Internet.



*Organizing monitoring team → Providing guidelines/promotion for target businesses and monitoring/investigating violations → Collecting statements from violators → Imposing fines (no labels)/reporting or investigating & forwarding (false labels)

2) Punishment for Violators

False country of origin labels on fishery or manufactured fishery products (including salt) may result in punishment for up to seven years in prison and/or up to 0.1 billion KRW in fines and no or incorrect labels may result in fines between 50,000 KRW and 10 million KRW. If government officers access is rejected, interrupted, or avoided for no acceptable reason, fines up to 5 million KRW may be imposed.

2. 2011 Major Task Results

I. Monitoring Performance

In 2011, 19,034 out of 100,000 businesses were investigated for the country of origin labeling for fishery and manufactured fishery products and violations were found in 1,006 businesses. Among them, 160 false labels (696 million KRW) were discovered to report to the prosecution and 845 cases were fined for no labels (60 million KRW).

1) Overall Results

Table 2. Overall Monitoring Results for Country of Origin Labels (Unit: times, people, locations)

Category	Monitoring	No. of Businesses	Monitoring Officers				
			Total	Government officers	Honorary monitors	Public agents	Related agencies
Total	2,079	19,034	7,834	4,732	2,092	277	733
Independent	1,733	15,040	5,898	3,948	1,640	214	96
Joint	346	3,994	1,936	784	452	63	637

2) Discovered Cases

Table 3. Discovered Cases by Monitoring Method (Unit: Cases, 1,000 KRW)

Category	Total		No label		False label		Incorrect labeling	
	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount
Total	1,006	900,273	840	59,608	160	839,700	6	965
Independent	647	518,534	556	37,234	88	480,508	3	792
Joint	359	381,739	284	22,374	72	359,192	3	173

Table 4. Monitoring Performance Year-on-year (Unit: times, people, locations)

Category	Monitoring	No. of Businesses	No. of People	Monitoring Officers				
				Total	Government officers	Honorary monitors	Public agents	Related agencies
Total	347	19,034		7,834	4,732	2,092	277	733
2010	1	15,040		5,898	3,948	1,640	214	96
2011	346	3,994		1,936	784	452	63	637

Table 5. Discovered Cases by Type of Business (Unit: Cases, 1,000 KRW)

Item	Total		No label		False label		Incorrect labeling	
	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount
Total	1,006	900,273	840	59,608	160	839,700	6	965
Large marts	21	871	19	529	-	-	2	342
Small/medium marts	189	11,110	156	7,445	32	3,612	1	53
Wholesale	15	955	11	633	4	322	-	-
Traditional marketplace	218	21,827	180	13,760	37	7,987	1	80
Raw fish Restaurants	448	81,119	394	30,165	52	50,464	2	490
Processors	27	439,413	15	1,889	12	437,524	-	-
Distributors	72	155,409	53	4,379	19	151,030	-	-
Salt producers	3	186,961	-	-	3	186,961	-	-
Others (Street vendors, etc.)	13	2,608	12	808	1	1,800	-	-

II. Special Monitoring for Peak Season of Fishery Product Consumption

Special monitoring was performed during the peak season of fishery product consumption to eradicate violations, establish order in distribution, and protect consumers.

Special monitoring was scheduled for the New Year's (Jan 27-Feb 7, 205 violations found) and Chuseok (Aug 22-Sep 9, 126 violations found) to eradicate violations during the holiday season.

Following the spread of radioactive substances from the nuclear plants in Fukushima, Japan, special monitoring was performed for fishery products from Japan (Mar 11-Apr 30, 51 violations found) and for

salt (Apr 25-May 24, 1 violation found for false label) to prevent selling Japanese fishery products as local products to relieve consumers.

Picture 1. Monitoring the Country of Origin of Salt (Sep '11)

During the peak season of fishery product consumption for making Kimchi, special monitoring was performed for fermented shrimp sauce, fresh oysters and sun-dried salt (Nov 14-Dec 7, 54 violations found).

III. Creating Synergies and Efficiency of Joint Monitoring

For the purpose of integration and creating synergies, joint monitoring for the country of origin and livestock sanitation was carried out for businesses handling agro-fishery products to prevent redundancy and improve efficiency.

As a result, four violations were found in terms of livestock sanitary management. Other outcomes were development of monitoring techniques and mutual understanding of common interests.

Also, Animal, Plant and Fisheries Quarantine & Inspection Agency, Korea Coast Guard and Korea Customs Service gathered for joint monitoring of the country of origin of fishery products to enhance synergies, public promotion, and reliability.

Major accomplishments included discovering an organization that sold Chinese salt as local salt (300 tons, 180 mn KRW in value) and conducting joint press briefing (MBC, KBS, Chosun Ilbo, etc).

IV. Education and Public Promotion

Consumers, distributors, honorary monitors, and other related officers were provided trainings (181 sessions 2,542 people), and related officers from Korea Food Service Industry Association, related industries and government offices were trained before the application of country of origin labeling of fishery products in restaurants (15 sessions, 3,000 people).

To establish consumer-oriented country of origin labeling, promotional leaflets (175,000 copies) and signs (40,000 pieces) were produced and disseminated and the country of origin labeling of fishery products in restaurants was publicly promoted via broadcasting, subway advertising and outdoor sign boards.

Picture 2. Promotional Resources on the Country of Origin Labeling of Fishery Products in Restaurants (Oct '11)

V. Special Judicial Police Officers

Judicial police officers engaged in strict investigation activities to report 80 cases of false labeling to the Public Prosecutors.

In detail, 170 judicial police officers were appointed and 60,450,000 KRW was funded for the investigation (50,000 KRW/month) to prevent violations and discover violators.

Moreover, the Judicial Research & Training Institute held on-the-job training (16 sessions, 80 people) to enhance the expertise of special judicial police officers, along with joint workshops and Prosecution Service's Special Judicial Police Officer Operating Council for their occupational development.

Picture 3. Workshop to Build Capacities of Special Judicial Police Officers (Daecheon, Chungcheongnam-do, Nov '11)

VI. Private Monitoring by Honorary Monitor Agents

To improve private monitoring by honorary monitor agents, 426 honorary fishery monitor agents were appointed and a total of 2,035 people were engaged in the monitoring activities throughout the year. For efficient management and activities, professional training (twice/year) was offered.

Picture 4. Awarding Meritorious Special Judicial Police Officers and Honorary Monitor Agents (Headquarters, Nov '11)

VII. Research and Development of Country of Origin of Fishery Product Identification Method

Advanced equipment was used for the identification of the country of origin to overcome the limitations of monitoring through organoleptic determination and ensure clarification and evidence for more efficient monitoring activities.

In 2011, a genetic method was used on hairtail and squid out of 36 existing items to monitor 328 cases (174 cases of hairtail and 154 cases of squid; Jul-Aug). This survey verified the validity of onsite monitoring. Also, a genetic analysis method was developed to identify Mizo dako and Madako to prevent altering the country of origin of fishery products from North Korea.

3. Country of Origin Labeling of Fishery Products in Restaurants

I. Background

Aftert the country of origin labeling system for agricultural and livestock products was introduced to restaurants (Dec '05), the need for the country of origin labeling system for fishery products in restaurants was suggested and the Office for Government Policy Coordination recommended autonomous pilot projects (Sep '05). The pilot projects were implemented from 2006 through 2011 and officially launched on April 11, 2012.

II. Overview

Target items are all foods prepared (fresh, soup, grill, steam, fry, etc) and sold using major farmed fish and the six items that are frequently falsely claimed as local products (flatfish, rockfish, red seabream, eel, mudfish and octopus).

Target restaurants are general restaurants, food courts at rest areas, meal services, and caterers designated by Article 21 of the Food Sanitation Act Enforcement Decree (about 650,000 locations nationwide); specifically, there are about 280,000 locations of raw fish restaurants, Korean restaurants, Japanese restaurants, sushi restaurants, mudfish soup restaurants, and freshwater eel restaurants.

III. Performance

Before the official application (April 11, '12), we focused on promoting the country of origin labeling system for fishery products in restaurants and offered training to local government offices and related businesses nationwide.

To build the infrastructure for efficient monitoring of country of origin labeling for fishery products in restaurants, training was offered for responsible government investigators and honorary monitor agents.

For early establishment and public promotion, country of origin labeling signs (13,000 pieces), promotional leaflets (30,000 copies), and promotional pamphlets (175,000 copies) were produced and distributed to restaurants and consumers.

We also used promotional broadcasting and campaigns via public TV (KBS), radio (CBS) and subways to prepare for the application of country of origin labeling system for fishery products in restaurants.

Quality Control

1. Introduction

The quality certification system for fishery products confers a quality mark on packaging to help consumers to know that the government operates quality control and choose safe quality fishery products, and producers to produce safe fishery products.

2. Need for Government Certification System of Fishery Products

Korea's certification system for fishery products was established by the "Specialty Fishery Product Quality Certification System (Maritime Service Notice, Feb 22, 1993) pursuant to the 「Agro-fishery Manufacture Industry Promotion and Quality Control Act」. The purpose is to improve product quality, promote fair trade, increase profits for producers, and provide safe quality fishery products for consumers by attaching marks on fishery products certified by the government. It also aims to increase benefits for both producers and consumers and to prevent selling imported products as local products.

3. Status of Quality Certification System of Fishery Products

I. Quality Certification System of Fishery Products

The Quality Certification System of Fishery Products involves certification of quality by a national agency or quality certifier to improve the quality of products and protect consumers. Target products are fishery products, specialty fishery products and traditional food. Certified items include 78 relatively simply processed fishery products that can be competitive in the market, including dried yellow corvine and dried sea bream. Specialty certified items are 11 manufactured specialty products using region-specific or symbolic fishery products, including seasoned dried filefish and encapsulated kelp.

Table 6. Target Items for Quality Certification of Fishery Products

Products	Items
Dry Products (15)	Dried squid, half-dried squid, dried red seabream, dried anchovies, dried mitra squid, dried blue shrimp, dried pollack, dried pollack fillets, dried Pollack strips, dried yellow corvine, dried mussels, dried oysters, dried Pacific saury, dried icefish fillets, half-dried mitra squid
Salted Products (3)	Salted kelp, salted brown seaweed, salted mackerel
Seaweed (9)	Dried laver, dried rock laver, dried brown seaweed strips, dried chopped brown seaweed, dried brown seaweed yarns, dried kelp, dried chopped kelp, steamed seaweed fusiforme, dried laver (salted)
Raw Fish (23)	• Fresh & refrigerated: Flatfish, rockfish, red seabream, yellow tail, Japanese-Spanish mackerel, sea bass, squid, conger eel, sea squirt, fresh oyster, skate ray, silver pomfret, gizzard shad • Frozen: Egg cockle, red shell, shrimp, surf clam, mitra squid, tuna, spipefish, skate ray, silver pomfret, red shell (scallop)
Frozen Seafood (28)	Mackerel, hairtail, Japanese-Spanish mackerel, eel, conger eel, cod, crab, flounder, yellow croaker, red seabream, blackthroat seaperch, horse mackerel, squid, octopus, Pacific saury, Pacific herring, shrimp, sea bream, oyster, silver pomfret, brown croaker, skate ray, red shell (scallop), abalone, webfoot octopus, dried pollack, red snow crab meat (cooked, cubed), red snow crab meat (cooked, sandwiched)

※ Source: Animal, Plant, and Fisheries Quarantine & Inspection Agency (Department of Fishery Products Quality and Safety, 2011)

Table 7. Target Items for Quality Certification of Specialty Fishery Products

Products	Items
Seasoned Processed Products (9)	Seasoned dried filefish, seasoned clams, seasoned squid, seasoned squid strips, seasoned stretched squid, seasoned cut filefish, seasoned stretched filefish, trout (smoked), Masou salmon (smoked)
Processed Seaweed (2)	Kelp capsules, kelp granules

※ Source: Animal, Plant, and Fisheries Quarantine & Inspection Agency (Department of Fishery Products Quality and Safety, 2011)

Finally, traditional fishery products are Korean traditional fishery products made using traditional or new methods and have 47 items including fermented squid and fermented anchovies.

Table 8. Target Items for Quality Certification of Traditional Fishery Products

Category	Item
Fermented (30)	• Fermented (24): Squid, pollack roe, pollack intestines, clams, beka squid, Pacific sand lance, oyster, spiny turban shell, tiny shrimp, anchovies, cod gill, Pollack gill, freshwater shrimp, coralfish, shrimp, colored abalone, large-eyed herring, small shrimp, scallop, herring roe, sea squirt, hairtail intestines, mitra squid, abalone • Fish sauce (4): Anchovies, Pacific sand lance, plum anchovies, shrimp • Fermented with grains (2): Flounder, Pollack
Porridge (6)	Dried Pollack, cod, abalone, mussels, clam, oyster
Seasoned (3)	Crab, Japanese Swimming Crab, Chinese Mitten Crab
Dried (2)	Yellow Corvina, Dried Brown Seaweed Yarns
Other (6)	Seasoned Laver, Yellow Corvina in Pepper Paste, Asian clam soup, marinated eel, dried seaweed, fish soy sauce

※ Source: Animal, Plant, and Fisheries Quarantine & Inspection Agency (Department of Fishery Products Quality and Safety, 2011)

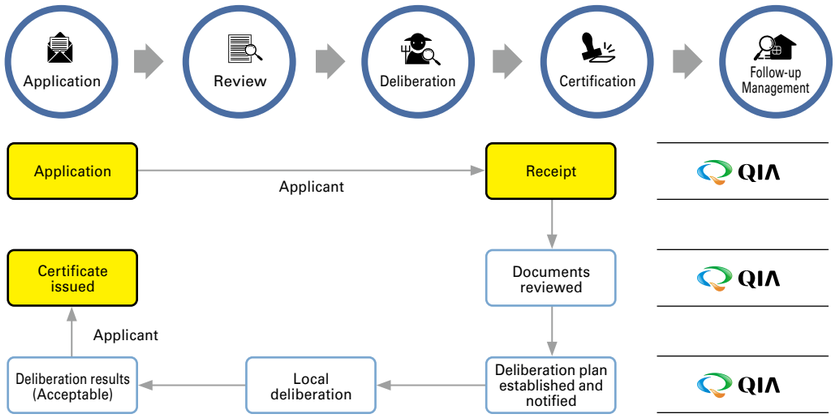
Considering the current status of registration of quality-certified fishery products, there were 53 items and 214 suppliers certified and 389 cases of certifications in 2011. The number of certification case increased 14% from 2010.

Table 9. Registration of Quality-certified Fishery Products

Year	Certified Items	Certified Suppliers	Certifications
2011	53	214	389
2010	51	205	340
2009	55	217	362

※ Source: Animal, Plant, and Fisheries Quarantine & Inspection Agency (Department of Fishery Products Quality and Safety, 2011)

Figure 1. Procedure of Quality Certification



※ Source: Animal, Plant, and Fisheries Quarantine & Inspection Agency (Department of Fishery Products Quality and Safety, 2011)

II. Certification System for Eco-friendly Fishery Products

The certification system for eco-friendly fishery products certifies fishery products containing no harmful chemicals or minimal veterinary medicinal products, or their sanitary manufactured products. Currently, there are 15 products designated as eco-friendly fishery products, including flat fish, eels, oysters, mussels, laver and brown seaweed. For the producers of these products, a national agency examines the production process and goods on the market at least once every semi-year to verify compliance with the standards of eco-friendly products, consistency between labeling on packaging and contents inside, and appropriateness of labeling.

Table 10. Target Items for Certification of Eco-friendly Fishery Products

Category	Item
Farmed fish (3)	Flat fish, rainbow trout, eel
Farmed shellfish (3)	Oysters, mussels, abalone
Farmed crustaceans (1)	Litopenaeus vannamei
Farmed seaweed (4)	Laver, brown seaweed, seaweed fusiforme, kelp
Processed seaweed (4)	Dried laver, dried brown seaweed, salted brown seaweed, salted laver

※ Source: Animal, Plant, and Fisheries Quarantine & Inspection Agency (Department of Fishery Products Quality and Safety, 2011)

Considering the current status of registration of certified eco-friendly fishery products, there were 8 items and 37 suppliers certified and 47 certification cases in 2011. The numbers of certified supplier and certification case more than doubled compared to 2010.

Table 11. Registration Status of Certified Eco-friendly Fishery Products

Year	No. of Certified Items	No. of Certified Suppliers	No. of Certifications
2011	8	37	47
2010	6	18	21
2009	2	1	

※ Source: Animal, Plant, and Fisheries Quarantine & Inspection Agency (Department of Fishery Products Quality and Safety, 2011)

III. Seafood Traceability System

Seafood Traceability System records and manages the history of fishery products from farm to table to help consumers to choose safe fishery products. There are 18 items currently registered with the Seafood Traceability System, including flat fish, yellow croaker, sea bream and red seabream. The warehousing and release information of a product is disclosed to consumers using the 13-digit tracking number for production, distribution and sale.

Figure 2. Seafood Traceability System

Seafood Traceability System discloses the production, manufacture, and distribution information from sea to table to help consumers to choose safe fishery products.

※ Source: Animal, Plant, and Fisheries Quarantine & Inspection Agency (Department of Fishery Products Quality and Safety, 2011)

Considering the registration of Seafood Traceability System, there were 18 items and 349 suppliers certified, and 540 certification cases in 2011. The number of certification cases decreased by 11% from 2010.

Table 12. Current Status of Registration of Seafood Traceability System

Year	No. of Certified Items	No. of Certified Suppliers	No. of Certifications
2011	18	349	540
2010	16	428	602
2009	12	326	468

※ Source: Animal, Plant, and Fisheries Quarantine & Inspection Agency (Department of Fishery Products Quality and Safety, 2011)

IV. Geographical Indication System

The Geographical Indication System is to indicate that a fishery product or its manufactured product is locally produced when its quality, reputation, or other characteristics are region-specific. It is promoted for the quality of region-specific fishery products or manufactured fishery products to nurture local specialty industries and to protect consumers.

Currently, there are 11 items registered for the Geographical Indication System, including Boseong Beolgyo Cockles, Wando Brown Seaweed & Kelp, and Jangheung Seaweed fulvescens.

Table 13. Registration of Geographical Indication System of Fishery Products

No.	Item	Date	Name	Registered by
1	Cockle	Feb 25, 2009	Boseong Beolgyo Cockle	Boseong Beolgyo Cockle Fishery Cooperative
2	Abalone	Feb 25, 2009	Wando Abalone	Wando Abalone Association Fishery Cooperative
3	Brown Seaweed	Feb 25, 2009	Wando Brown Seaweed	Wando-gun Brown Seaweed Association
4	Kelp	Feb 25, 2009	Wando Kelp	Wando-gun Kelp Producer Association
5	Brown Seaweed	Feb 25, 2009	Gijang Brown Seaweed	Gijang Seaweed Association Fishery Cooperative
6	Kelp	Feb 25, 2009	Gijang Kelp	Gijang Seaweed Association Fishery Cooperative
7	Red Shell	Feb 25, 2009	Jangheung Red Shell	Jeongnamjin Jangheung Red Shell Fishery Cooperative
8	Laver	Aug 20, 2010	Wando Laver	Wando-gun Laver Fishery Cooperative
9	Flounder	Aug 20, 2010	Wando Flounder	Wando Flounder Fishery Cooperative
10	Laver	Jan 18, 2011	Jangheung Laver	Jangheung Musan Laver Producer Association
11	Seaweed fulvescens	May 13, 2011	Jangheung Seaweed fulvescens	Jeongnamjin Jangheung Seaweed fulvescens Producer Association

※ Source: Animal, Plant, and Fisheries Quarantine & Inspection Agency (Department of Fishery Products Quality and Safety, 2011)

4. Integrated Management of Certification System Marks for Agro-Fishery, Livestock and Forestry Products

In addition to the certification of fishery products, the Korean government operates various certification systems for agriculture, livestock and forestry products. As a consequence, 10 different certification marks (logos) were used for 16 certification systems. However, this only caused confusion for producers and consumers and decreased the effectiveness of government certification system because there were too many marks. In response, the Korean government adopted a new common logo for the efficiency of agrifood certification system. The new common logo uses one symbol with 10 variations for simple and concise expression. The previous marks will be allowed during the 2-year grace period until 2013 to prevent further confusion.

Table 14. Government Certification Systems for Fishery Food

Type (Year Adopted)		Concept	Certification Mark	
			Until 2011	From 2012
Quality Certification System (1993)	Quality	Quality of Fishery Products and Consumer Protection.	수산물품질인증	품질인증 (QUALITY SEAFOOD) 농림수산식품부
	Traditional	For preservation/succession of traditional/popular quality.	수산전통식품	전통식품 (TRADITIONAL FOOD) 농림수산식품부
Geographical Indication (2008)		Region-specific specialty products.	K P G I	지리적표시 (PGI) 농림수산식품부
Eco-friendly Fishery Product Certification System (2008)		Fishery products or manufactured products with minimum synthetic chemicals.	친환경수산물	친환경수산물 (ECO SEAFOOD) 농림수산식품부
Seafood Traceability System (2008)		To record/manage history of fishery products.	www.fishtrace.go.kr 수산물이력제 Seafood Traceability System	www.fishtrace.go.kr 수산물이력제 Seafood Traceability System

Safety Control of Domestic Fishery Products

1. Introduction

Safety inspection and survey of fishery products refers to the surveillance or survey of fishery products to verify that their residual heavy metal/antibiotics/toxicity/food poisoning bacteria do not exceed the allowable limit by law (Food Sanitation Act) in production (farm/processing factories), storage (frozen/refrigeration), pre-delivery (consignment, wholesale, distribution centers, etc) and distribution (markets, schools, large meal service providers, etc) stage for quality and safety.

2. 2011 Safety Inspection Status

I. Survey System

The phased safety survey of fishery products is done by QIA and Korea Food & Drug Administration, but the standards are managed by Korea Food & Drug Administration. For fishery products, they are processed in two categories: safety survey for regulations (73 items, e.g., banned chemicals) and residue survey for safety diagnosis (75 items, e.g., Vibrio parahaemolyticus).

Table 15. Safety Survey System for Fishery Products

Category		Safety (Residual) Survey for Fishery Products				Standards& Specifications
		Production	Processing	Distribution	Import	
Fishery Products	Law	Act on Quality Control of Fish and Fisheries Products	Food Sanitation Act	Food Sanitation Act	Food Sanitation Act	Production: No standards. Consumption: Food Sanitation Act (KFDA)
	Institute	QIA, 3 Cities/ Provinces[1)]	KFDA, Cities/ Provinces	KFDA, Cities/ Provinces	QIA (Consigned)	
Manufac-tured Fishery Products	Law	-	Food Sanitation Act	Food Sanitation Act	Food Sanitation Act	
	Institute		KFDA, Cities/ Provinces	KFDA, Cities/ Provinces	KFDA, Cities/ Provinces	

※ Safety Survey System for Fishery Products (managed by the Department of Fishery Products Quality and Safety from production to trading).

II. Corrective Actions

When the product is rejected, appropriate corrective measures shall be taken for safety survey, including deferment of distribution, conversion of use, disposal (from production until before distribution/local government), prohibition of sale, cancellation of registration and deferment of distribution (export, quality certificate/Department of Fishery Products Quality and Safety); for residue survey, appropriate measures include import inspection, special inspection and additional monitoring.

III. Targets and Target Harmful Substances

Government-controlled safety inspection and survey applys to fishery products in production/ storage/ distribution and fishery products supplied to school meal services and large meal service providers (farmed, from coastal waters, and pelagic); private-requested (consumer) safety inspection and survey applies to fishery products submitted by manufacturing plants and farmers for safety inspection before exportation or for harmful substance diagnosis (flounders exported to Japan, submitted items, etc).

Target harmful substances include heavy metals, antibiotics, microorganisms, toxins, radioactivity, chemical residues, organic matters, banned chemicals, diseases, growth hormones, etc.

IV. Performance

1) Regular Survey

In 2011, 8,001 cases[2)] were surveyed for fishery products in production/storage/trade/ distribution. The performance was 129% of the plan (6,200 cases).

Table 16. Performance of Safety Inspection and Survey

	2009	2010	2011
Government	2,144	2,834	3,104
Private (Consumer)	4,992	4,411	4,897

The 2011 surveillance and survey found that there were 199 rejected cases, which were 2.5% of total cases. In detail, there were 17 rejected cases (0.5%) found in government survey in production stage and 182 cases (3.7%) found in private survey, including flounders exported to Japan. Most rejected substances were permitted antibiotics, but there were also prohibited chemicals (nine cases), including nitrofuran (eel) and chloramphenicol (flounder), as well as methyl mercury (shark).

The items and substances surveyed in 2011 included 421 items and 103 substances.

2) Special Survey

In February 2010, common hammerhead was found exceeding allowable methyl mercury standard by 2.2 times (limit: 1.0mg/kg) and the need for safety management of sharks was raised. Subsequently, safety survey was performed on five kinds of pelagic sharks after October 2010 (common hammerhead, pelagic thresher sharks, etc). In 2011, 369% (590 cases) of the plan (160 cases) were inspected and 8 rejected items were disposed.

In May 2010, chloramphenicol (banned chemical) was detected in a flounder farm in Wando, Jeollanam-do and a special survey was performed for 10% of flounder farms across Korea (80/740 farms). The survey found no chloramphenicol in any of the 80 farms in 23 cities/provinces, including Jeju and Wando.

In May 2010, nitrofuran (banned chemical) was detected in an eel farm in Gimje, Jeollabuk-do and a special survey was performed for 10% of eel farms across Korea (48/507 farms). The survey found no nitrofura in any of the 48 farms in 60 cities/provinces, including Yeonggwang and Hampyeong.

1) Three cities/provinces: Busan, Gyeongsangnam-do, Jeollanam-do

2) In accordance with Food Safety Basic Plan, local governments with easy accessibility to producers are commissioned to perform fishery food safety survey (Prime Minister, May 20, '09).

V. System Improvement of Safety Survey for Fishery Products

1) Redefinition of Safety Terms and Simplification of Survey by Purpose

The terms were redefined based on legal definitions and the survey process was integrated. The two categories of terms for government/private management and safety surveillance/survey were replaced with one category of legal terms for safety/residue/other survey.

The terms were classified and managed by purpose for commonly consumed items, weak areas, exports, certification, food poisoning, etc.

2) Scientific Survey Basis

The residue survey basis was established for consistent monitoring of 11 unstandardized fishery products to establish safety survey standards at the production stage. To ensure the representation of samples, the phased full-batch survey will be implemented from 2012 through 2016.

Table 17. Full-batch Survey (Unit: cases)

2012	2013	2014	2015	2016
1,458	2,443	3,368	3,523	3,601

06

Quality Control and Safety Management of Veterinary Medicinal Products

1. Introduction
2. Management System of Veterinary Medicinal Products
3. Safety Management of Veterinary Medicinal Products
4. Quality Control of Veterinary Medicinal Products

1. Introduction

Veterinary drugs, veterinary quasi-drugs and veterinary medical devices (hereafter referred to as 'veterinary medicinal products (VMPs)') are widely used for the purpose of diagnosis, prevention and medical treatment of livestock and pet animals. In particular, VMPs contribute to higher income for livestock farmers and the sound development of livestock industry by preventing the damage caused by livestock diseases in advance and are closely related with public health in areas of the prevention of zoonosis, antibiotic residues and antimicrobial resistance in livestock products/sea food and radiation safety management for animal diagnosis.

Domestic veterinary medicinal industry has developed with the livestock industry and experienced tremendous changes along with the livestock environment change. The productivity imporvement was emphasized in the 1970s, the quality enhancement in the 1980s. Since the 1990s along with the launch of WTO, trade liberalization has accelerated and starting the 2000s, FTAs have expanded as a form of regional economic integration, and multinational corporations have advanced into the domestic market, imported VMPs are rapidly encroaching on the domestic market.

To actively overcome these domestic and foreign challenges and develop domestic venterinary medicinal industry, Animal, Plant and Fisheries Quarantine and Inspection Agency (QIA) developed comprehensive measures to activate the export since 2008 and achieved 117.2 billion KRW of veterinary medicinal exports in 2011 to over 82 countries around the world through private public cooperation.

Table 1. The Status of VMPs export (Unit: Number, Number, 100 million KRW)

Category	2007	2008	2009	2010	2011
The number of exporting companies	28	28	31	38	35
The number of export items	398	421	495	534	621
Export amount (100 million KRW)	457.6	597	855	846	1,172

※ Source: Korea Animal Health Products Association (KAHPA)

2. Management System of Veterinary Medicinal Products

In accordance with Article 85 of Pharmaceutical Affairs Act (special cases for VMPs) and Article 39 of Medical Devices Act (special provisions for veterinary medical devices), the Commissioner of Korea Food & Drug Association (KFDA) is in charge of the management of general drugs, quasi drugs and medical devices and the mangement of drugs, quasi drugs, and medical devices for animals only is under the Minister for Food, Agriculture, Forestry and Fisheries (MIFAFF). And according to Article 32 of 'Regulations on Delegation and Commission of Administration Authority' (Presidential Decree), the management of VMPs is delegated to the Commissioner of QIA. MIFAFF operates 'The Facility Standards of Pet Pharmacy, Manufacturer, Importer and Seller of VMPs' (Presidential Decree) and 'Handling Rules on VMPs' (MIFAFF Decree) and QIA and local governments are systematically managing the manufacture, import, distribution and sale of VMPs in accordance with the relevant regulations.

The QIA works to enhance global competitiveness of our veterinary medicinal industry to contribute to the development of domestic livestock industry by improving quality and distribution management of VMPs and ensuring the safety and efficacy of VMPs; it is also in charge of veterinary pharmaceutical affairs including permission (report) of manufacturing and importing (report) of VMPs and manufactured and imported items, guidance/supervision/administrative measures on manufacturers and importers, collection inspection of products available on the market (or post-marketing surveillance), national assessment (or batch-release assay by government) of biologicals, post approval management of excellent quality control companies for VMPs (KVGMP); after 2011, radiation safety management is delegated to QIA in accordance with 'Veterinary Act' (revised Jan 25, 2010) and 'Safety management rules for animal diagnostic x-ray equipment '(established Jan 26, 2011, MIFAFF Decree) and QIA is also responsible for inspection of radiation equipment, designation of diagnostic agency and radiation exposure management for workers as well. With consumer interests about the safety of livestock and fishery products increasing and safety issues of VMPs including antimicrobial resistance and antibiotics residues in livestock and fishery products emerging, QIA plans to strengthen regulations and management to ensure the safe use of VMPs.

3. Safety Management of Veterinary Medicinal Products

The manufacturers and importers of VMPs are required to be authorized (reported) for the manufactured and/or imported items as well as the manufacture and/or import itself. The authorization of the manufactured and imported items is conducted in accordance with the relevant regulations of 'Pharmaceutical Affairs Act', 'Handling Rules on Veterinary Medicines' (MIFAFF Decree), and 'Regulations on Safety and Validity Inspection of Veterinary Medicines' (QIA Notification).

The QIA is contributing to development of domestic livestock industry and prudction of safe livestock products by ensuring qualified VMPs to be manufactured, distributed and sold through safety and efficacy inspection of VMPs in the process of authorization (report).

The numbers of manufacturers and importers of VMPs in 2011 are all 412 (manufacturers 169, importers 243) consisting of 238 for VMPs, 66 for quasi-drugs, 108 for veterinary medical devices and 3 for medical device repair companies.

Table 2. The Number of Manufacturers and Importers of VMPs (As of Dec 31, 2011, Unit: Number)

Category	VMPs	Quasi Drugs	Medical Devices	Total
Manufacturers	76	53	40	**169**
Importers	162	13	68	**243**
Total	**238**	**66**	**108**	**412**

※ Source: Korea Animal Health Products Association (KAHPA)

The number of manufactured and imported items authorized (reported) in 2011 is a total of 11,563 (7,361 manufactured, 4,202 imported), of which VMPs (including raw materials) are 7,311, quasi-drugs 3,365, and medical devices 887.

Table 3. The Number of Authorized (Reported) VMPs (As of Dec 31, 2011, Unit: Number)

Category	Manufactured	Imported	Total
VMPs (including Raw Materials)	5,446	1,865	**7,311**
Veterinary Quasi Drugs	1,701	1,664	**3,365**
Veterinary Medical Devices	214	673	**887**
Total	**7,361**	**4,202**	**11,563**

※ Source: Korea Animal Health Products Association (KAHPA)

The QIA is developing and operating the VMPs re-assessment plan to strengthen the safety, efficacy and quality control of VMPs in the phase of manufacture (import) and distribution until 2023 and plannig to improve relevant systems including reevaluation of new medicines and establishment of KVGMP, to systematically manage the safety and efficacy of VMPs.

4. Quality Control of Veterinary Medicinal Products

I. Quality Control of Biologicals in Batch Release Assay

To join the ranks of medicinal advanced countries, we are required to convert relevant regulations to Seed Lot management system. With many social issues emerging, there is a growing need for change in the quality control of biologicals.

Some of the recent issues include the controversy over welfare of laboratory animals and industrial animals, and measures to reduce antimicrobial resistance bacteria. More discussions and consultations are needed when many conflicts between producers and cousumers exist because consumers demand the supply of quality protein, better animal welfare and VMPs at the same time without any burden on consumers.

1) Batch Release Assay Results of Biologicals in 2011

The batch release assay for VMPs is a pre-marketing surveillance of manufactured goods, currently limited to biologicals. The World Organization for Animal Health (OIE) states that all biologicals have the risk of disease transmission and the quality control of biologicals is needed at the national level due to possible disease control disasters and enormous repercussions caused by variated vaccine-induced pathogenic increase, disease outbreaks by aberrant microorganisms and massive distribution of inefficacious vaccines.

The number of batch release assay on biologicals is all 397 (101 bacterial, 141 viral, 155 poultry biologicals), 20% decrease compared to 2009. The assay successfully prevented the distribution of defective products by finding and disposing 19 rejected drugs (3.2%) in advance. The reasons for the decreased number of assay were the increased number of exempted items three years after the introduction of the exemption system for imported products and the decreased number of livestock after three FMD outbreaks in 2010. Meanwhile, 183 exempted products were inspected and the manufatureres of 4 rejected products were subjected to recall and administrative measures. QIA will make every effort to assess exempted products more thoroughly to ensure the distribution of quality products, encourage manufacturers to improve quality control capacities and strengthen autonomous assays, and constantly reinforce assays with autogeneous vaccines.

2) Batch Release Assay Standard and Test Method

Biologicals among domestic VMPs are subject to batch release assay by the government when they are manufactured or imported. When request for the assay is made by manufacturer or importer, QIA conducts the batch release assay in accordance with the notification on 'Batch Release Assay Standards for VMPs.'

The assays include general, content, safety and titer tests; the general test has nine different test methods which shall be applied selectively depending on the features of biologicals such as inactivated or raw dried. The safety and titer tests are important to verify the safety and efficacy of biologicals and used for laboratory or purpose animals. Animal verification experimemt requires professional knowledge and various equipment and takes quite a long time. Currently, animal experiment laboratories are operating in Dangha-dong, Seo-gu, Incheon and at QIA headquarters in Anyang, which is equipped with facilities for fish vaccine assay and conducting batch release assay and civil inspection.

3) Establishment and Amendment of National Assessment Standard

The current notification on 'Batch Release Assay Standards for VMPs' is operating 307 assay standards by livestock species; 32 cattle, 74 pigs, 57 chickens and 35 dogs. These standards are flexible to reflect disease outbreak situation, manufacturing method by company or criteria into the notification, supporting the development and production of companies.

QIA will continue to establish relevant legal basis by notifing domestic disease situation and assay standards of manufacturers and importers.

Table 4. The Status of the Establishment and Amendment of National Assessment

Category	Cattle	Pig	Chicken	Duck	Dog	Cat	Fish	Horse	Rabbit	Diagnostic Reagent	Total
Total Number of Standards	32	74	57	1	35	3	5	6	6	88	307
Established in 2011			1							1	2
Amended in 2011	1					1					2

4) Management of Batch Release Assay-Exempted Products

The exemption system for batch release assay is to absolve excellent quality control manufacturers and importers (KVGMP) from the bach release assay through actual investigation and document review to ensure the responsibility of quality control of manufacturers and the reliability of livestock fields at the same time. The system was applied to chemicals first and then biologicals from 2007. With active participation by manufacturers since the operation of the system, a total of 314 including 212 domestic and 102 imported items are currently exempted from the assay. However, several products are rejected in the collection inspection against the purpose of the system. Fifteen expemted items were cancelled including one exemption-cancelled item by the end of 2011 through the quality inspection of VMPs. The exemption of poultry and swine vaccines is increasing and the multivalent vaccine for flatfish developed and newly approved after 2010 is expected to be added to the exemption list.

Table 5. The Status of National Assessment Exempted Item

Category		2007	2008	2009	2010	2011	Total
By Livestock Species	Poultry	57	5	24	15	10	111
	Pig	68	9	9	14	10	110
	Cattle	23	6		2		31
	Flatfish	3					3
	Dog	23	10	8	5	9	55
	Cat	1	2				3
	Others	1					1
	Subtotal	**176**	**32**	**41**	**36**	**29**	**314**
By Country	South Korea	176	1	10	11	14	212
	USA		25	4	11	11	51
	France			7	5	1	13
	Japan, Spain				3(Japan) 2(Spain)		5
	Czech Republic		3		1		4
	Hungary, Brazil		3(Hungary)			2(Brazil)	5
	Netherlands			20	3	1	24
	Subtotal	**176**	**32**	**41**	**36**	**29**	**314**

II. The Collection Inspection Results of VMPs

The collection inspection for pharmacovigilance is a post quality control system to conduct the inspection of VMPs including antibiotics, synthetic antimicrobials, nutritional supplements and biologicals to prevent the distribution of defective products.

The number of collection inspection for pharmacovigilance was 1,695 in 2011, 102.7% of the annual plan (1,650), and the inspection is getting stringent by increasing the number of inspection each year.

Figure 1. The System of Collection Inspectioni for Pharmacovigilance

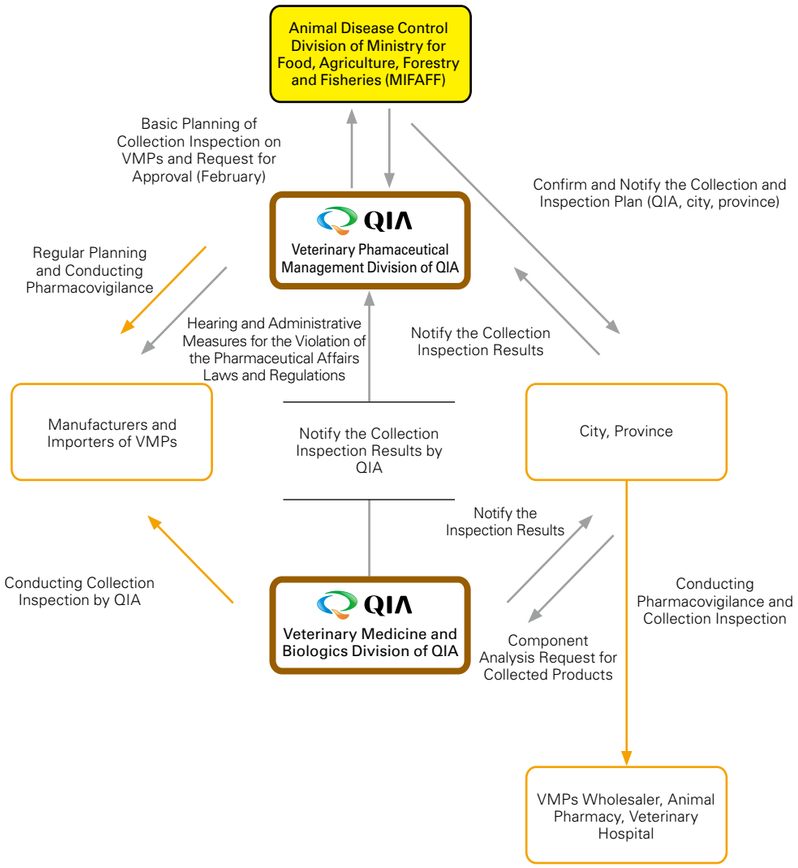


Table 6. Annual Pharmacovigilance Collection Inspection (Unit: Number)

Year	2005	2006	2007	2008	2009	2010	2011
Inspection	1,517	1,532	1,508	1,583	1,835	1,658	1,695
Rejected (%)	38(2.5)	47(3.1)	49(3.2)	25(1.6)	59(3.2)	46(2.8)	47(2.8)

Major reasons for rejection included inappropriate safety (rancidity, storage conditions, composition interactions), degree of mixing, and the standardization of manufacturing process (cross-checking the weighing of raw materials), use of proper raw materials, test methods, analysis standard management. QIA will increase the effectiveness of the collection inspection by reflecting results and weak parts into future pharmacovigilance inspections, encouraging manufacturers to proactively conduct autonomous quality control, collecting rejected items and reflecting the results in the 2012 inspection plan as well.

III. Stricter Quality Control of VMPs and Communication with Manufacturers

To improve the quality control of VMPs and increase civil satisfaction, we constantly tried to communicate with the manufacturers and importer of VMPs in 2011.

In order to strengthen the post management of VMPs, prmote exchange among industry, academia and research institutions for the development of new drugs and establish better regulations and systems required for the development and quality control of VMPs, a symposium on the 'International Trend of Quality Control Technology of Veterinary Generic Drugs' was held by the Korean Society of Veterinary Pharmaceuticals (KSVP) established in 2006 to find a way to revitalize the stagnant domestic veterinary medicinal industry and advance into overseas markets in 2011.

Around 40 people from VMPs industry, Korea Animal Health Products Association (KAHPA) and private and public organizations attended Quality Control Conference for Manufacturer and Importer of Veterinary Vaccines held in 2011.

IV. Expansion of Quality Control Foundation of VMPs through Research and Development of Veterinary Science and Technology

The development and standardization research of quality control technology have been conducted annually in order to improve the quality of VMPs. In 2011, we performed a total of five research projects such as 'Research on equivalence and drug evaluation of veterinary generic drugs', 'Risk profiling of the mid- and long-term roadmap development for antibiotic resistance risk assessment', 'Research on standardization for the quality control of veterinary herbal medicines using chromatographic pattern analysis', 'Study on statistical analysis of usage and evaluation of biologics in Korea' and 'Research on investigation of the potency assay system and 'Study on the establishment of the Korean National Standard Assay for overseas FMDV'. By carrying out these projects, we achieved the following results: development of the mid- and long-term roadmap for antibiotic resistance risk assessment, establishment of equivalence and drug evaluation completed for veterinary generic drugs, achievement of quality veterinary herbal medicines using chromatographic pattern analysis, statistics analysis for the status of usage and evaluation information of domestic biologicals, efficacy survey of foreign FMDV and establishment of domestically applied assay methods. We also produced a total of 21 results through policy suggestions, standard technology utilization, technology transfer and scientific presentations.

V. Strengthening International Operations of Veterinary Medicines

In 2009, the OIE and VICH[1)] Member States adopted measures to increase the global standards for the management of VMPs at the 5th policy planning (2011-2015) to coordinate the management standards and policies for VMPs of advanced and developing countries through education, training and support for developing countries.

As an OIE member country, Korea is reporting the annual manufacturing status of major veterinary biologicals and participated in the focal point education workshop hosted by OIE in Japan in November, in Cambodia in July, and in Japan again in Novemeber.

VICH is an organization aimed to exempt experiments during authorization in the member states when VMPs are manufactured in accordance with the VICH guidelines. However, the mutual recognition between the member countries has yet to be made 15 years after the establishment. Furthermore, OIE does not apply the VICH guidelines as OIE guidelines for VMPs and just introduces the roles of VICH and guileline development trends.

In the 2011 VICH regular meeting, the VICH outreach forum (hereafter referred to as VICH forum) between member countries of OIE and VICH was established and the member countries were required to participate in the forum. But whether to include the existing global companies attending as observers in the VICH forum was not determined at the meeting. Currently, Veterinary Disease Institute (AHI) and Veterinary Medicines Association (JVPA) from Japan, International Federation of Animal Health (IFAH) from Europe, Animal Health Alliance established by global companies from Australia and New Zealand and Canadian Veterinary Disease Institute (CAHI) are participating in the VICH forum. In the workshop held in Japan in November 2011, whether to include the existing observers and organizations representing VMPs manufacturers from other areas was discussed. Against this backdrop, Korea is also required to take strategic action by cooperating with Korea Animal Health Products Association (KAHPA) to increase exports of domestic VMPs and secure global influence.

1) VICH: International Cooperation on Harmonization of Technical Requirements for Registration of Veterinary Medicinal Products

07

Animal Protection and Welfare

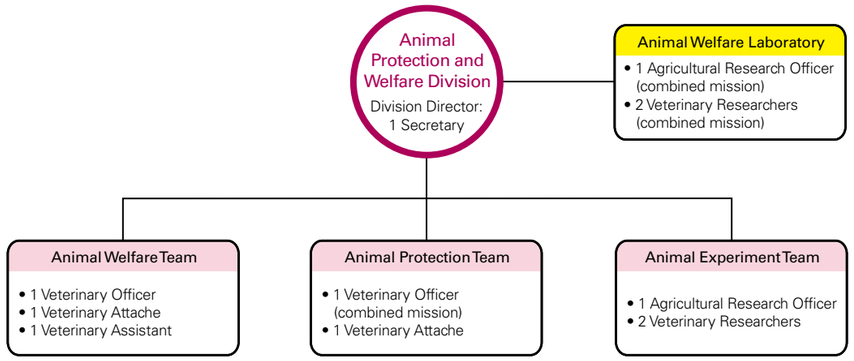
1. Introduction
2. 2011 Animal Protection and Welfare Projects Results

1. Introduction

The Animal Protection and Welfare project, newly established as the first domestic animal protection exclusive organization on March 8, 2006, is being promoted as one of the 8 missions of the QIA. Following the complete amendment of the Animal Protection Act in August 2011, the QIA has been actively pursuing the project by toughening penalties for animal abuse, strengthening protection and management of abandoned and lost animals, expanding the roles of the animal protection center, and introducing a farm animal welfare certification system.

In reference to animal protection and welfare project, the QIA is trying to protect and promote the welfare of farm, companion and experimental animals in the policy and research fields, such as the legislation and amendment of the animal protection act, support for the establishment of related policies, education and promotion, exchange and cooperation with domestic and foreign civil organizations, animal registration system, support for protection system of abandoned animal and animal abuse monitoring duty, along with overall management of Institutional Animal Care and Use Committee (IACUC) and animal welfare research projects performance.

I. Organization and Business Scope of Animal Protection and Welfare Division



※ As of 31st December 2011

1) Animals Welfare Team (Main Duty): Overall Management of the Welfare of Farm Animals

- Support for the establishment of animal welfare policy.
- Operation of certification system of animal welfare livestock farm.
- Education and promotion of animal protection and welfare & Exchange and cooperation with domestic and foreign civil organizations.

2) Animal Protection Team: Support for Animal Protection System

- Support for animal registration system, abandoned- and lost-animal protection system, animal abuse monitoring duty.

3) Animal Experiment Team: Overall Management of Animal Experiment System & Operation of Animal Welfare Laboratory

- Management, evaluation, guidelines development and education and promotion of Institutional Animal Care and Use Committee (IACUC).
- Operation and improvement of animal experiment system & Animal protection and welfare-related research projects performance.

2. 2011 Animal Protection and Welfare Projects Results

I. Revitalization of Animal Protection and Welfare System

1) Support for Amendment of 'Animal Protection Act'

With the recent trend of increasing public interest in animal welfare, the MIFAFF pursued the complete revision of the 'Animal Protection Act'. In response, the Animal Protection and Welfare Division supported the amendment by reviewing related laws and regulations. The main contents of the 'Animal Protection Act' revised on August 11 are as follows:

- Animal abusers can be imprisoned for less than a year or fined less than 10 million KRW.
- In case of animal abuse, the local government can rescue, treat and protect the animal, and the incurring costs is borne by the owner.
- Starting 2013, all municipalities across the country operate the animal registration rule, however, in accordance with the ordinance, some areas such as rural and/or fishing villages might be excluded, depending on local conditions.
- The farms which breed or manage farm animals in qualified facilities in a humane way are certified as

animal welfare livestock farms and are given incentives for facilities improvement.

- Institutional Animal Care and Use Committee (IACUC) of animal experiment operating institution registered at QIA should be under supervision of QIA and should follow corrective orders when not properly operated or managed.
- Euthanasia-related regulations are toughened by specifying the subject and stipulating separate guidelines to ensure proper euthanasia of abandoned animals.
- To improve effectiveness of penalty regulations and consider fairness with relevant laws, the maximum fines are raised from 0.5 million KRW to 1 million KRW and fines by city and provincial ordinances from 0.3 million KRW to 0.5 million KRW.

2) Announcement of the Results of Information Collection and Data Analysis, including Animal Registration in 2010

With a increase in national income and in the number of nuclear family, more and more families live with companion animals. Along with the trend, the increasing number of abandoned animal and animal abuse is emerging as a social issue, raising awareness and need for animal protection.

In order to provide basic data to establish and operate the comprehensive policies for animal protection through regular surveys of the status of animal abandonment and to suggest policy direction through future outlook and forecast by investigating the annual trend in important statistical indicators regarding animal protection, the QIA announced the results of information collection and data analysis, including animal registration, in accordance with the Article 24 (Data Retention and Information Disclosure) of the Animal Protection Act in 2010. The summary is as follows:

i) Animal registration

- The test operation of animal registration was carried out for the first time in Seongnam-si, Gyeonggi-do after October 2008 and pilot projects are under operation in Gyeonggi-do, Incheon-si, and Daejeon-si (April 2009) as well. Also the animal registration is being fully implemented in Jeju-do (July 2009) and Busan-si (August 2009). As of December 2010, a total of 65,488 dogs are registered at 6 cities and provinces, 48 cities, counties and districts and 731 registration offices all over the country.

ii) Status and handling of abandoned animals

- The number of abandoned animals accommodated in the animal care facilities in 2010 is 100,899, among which 57,893 dogs account for 57.4% and 42,093 cats for 41.7%.

  The 59.0% (59,553) of abandoned animals happened in metropolitan areas, including Seoul, Gyeonggi and Incheon. Looking at the annual trend, the number sharply increased between 2003 and 2005, and then the rate has slowed down since 2006.
- 10.23 billion KRW has been spent annually for the handling of abandoned animals and the average protection period is about 38 days.
- The animals abandoned in 2010 are handled through euthanasia (26.8%), adoption (24.9%) and release (15.2%) in order. However, the rate of euthanasia has been gradually decreasing since 2005.

iii) Status of the abandoned animal protection facilities

- There are all 400 protection facilities for abandoned animals, among which 25 (4.4%) facilities are operated directly by local governments and 375 (95.6%) are commissioned to private animal shelter (including veterinary clint) for care. Protection facilities across the country are estimated to accommodate a total of 38,873 abandoned animals at the same time.

iv) Registration and operation status of animal sales and funeral business

- A total of 1,488 animal dealers have completed the registration with newly registered 513 dealers and 1,592 employees. Among these, 1,233 animal dealers (pet shops) comprise the largest proportion (82.8%). And there are five animal funeral companies with one in Busan and four in Gyeonggi-do.

v) Status and activities of animal protection inspector and honorary inspector

- The total number of animal protection inspectors appointed by local governments are 293 and the average number is 1.2 by city, county and district. A total of 110 honorary inspectors are commissioned to perform 173 animal protection activities.

vi) Operation of Institutional Animal Care and Use Committee (IACUC) and the status of animal experiment

- The 2011 report on IACUC operation by 325 institutions with animal experiment facilities found that 268 (82.7%) of them actually were operating IACUC.
- A total of 271 institutions (83.4%) utilized 1,659,817 animals for experiment.

3) Establishment of Animal Welfare Forum and Biannual Meeting

With increasing interests and importance of animal welfare, Animal Welfare Forum (AWF) was established in March 2010 for the purpose of preparing policy alternatives through dialogues and discussions on pending issues in various fields, such as farm, companion and laboratory animals among experts and stakeholders.

4) The World Organization for Animal Health (OIE) and International Trend Analysis and Response

The Animal Welfare Rules have been legislated and revised at the general meeting held every May. In order to reflect the views of Korea in the process of legislation and revision, we are gathering and analyzing opinions from relevant organizations such as producer association and animal protection institution by translating and distributing the legislated and/or revised articles. The Korean government

is keeping up with the international trend regarding animal welfare issues by actively participating in the relevant international meetings, workshops, and conferences hosted by OIE.

II. Establishment of Certification System for Animal Welfare Livestock Farm

1) Development of Standard and Certification Mark for Layer Farm

The certification system of animal welfare livestock farm has been introduced according to the amendment of the Animal Protection Act, and the annual plan to expand the animal welfare certification system has been prepared for layer farms in 2012, pig farms in 2013, broiler farms in 2014 and Korean native cattle, beef cattle and dairy cattle farms in 2015.

2) Pilot Evaluation of Animal Welfare Layer Farms

The certification evaluation team for layer farms was organized and received professional training on evaluation methods for a fair and objective assessment. From October, pilot evaluation has been conducted on the existing animal welfare farms to reflect the results in the certification standards of animal welfare livestock farm (by QIA).

III. Stable and Efficient Implementation of New Animal Protection and Welfare System

1) Improvement of Web Accessibility of the Animal Protection Management System

The Animal Protection and Welfare Division is operating animal protection management system in conjunction with animal protection department of every city and province (city, county, district).

The division acquired the certification mark of Web Accessibility (WA) by reducing pop-up windows, providing texts and subtitles suitable for contents within the system, enabling focus movement by keyboard to improve web accessibility of the handicapped to the animal protection management system.

Figure 1. Acquired Certification Mark of Web Accessibility (WA) in the Lower Right Corner of Animal Protection Management System

2) International Hands-on Workshop for Managers and Workers in Abandoned Animal Protection Center

To ensure the professionalism of workers and improve animal protection in the country through training of animal protection specialists, the QIA hosted the 'Hands-on workshop for managers and workers in abandoned animal protection center' in the Cool House Education Training Center of Konkuk University during October 19 (Wed) - 23 (Fri) in 2011.

In the workshop on 'The Revised Animal Protection Act and the Operation and Practices of Animal Protection Center', MIFAFF, RSPCA (Royal Society for the Prevention of Cruelty to Animals) and Animal Protection Center and Animal Rescue Management Association of Gawangju-si provided lectures on the roles, operation and practices of animal protection center to 148 animal protection officials and workers of animal care center.

Picture 1. 'Hands-on workshop for managers and workers in abandoned animal protection center' held at Education Training Center of Konkuk University

3) Training of Animal Protection Inspectors and Survey of Related Systems in Germany, and the United Kingdom

To explore ways of improving domestic animal protection and welfare policy, we visited the relevant national animal welfare organizations, abandoned animal care centers and welfare livestock farms and conducted field research in Germany and the United Kingdom for 10 days from September 27.

IV. Stricter Management and Supervision of Laboratory Animal and Animal Experiment

1) Establishment and Operation of Institutional Animal Care and Use Committee (IACUC) in QIA

The Institutional Animal Care and Use Committee (IACUC) was established in QIA on November 1, 2007 in accordance with the Article 14 of the 'Animal Protection Act' and has been currently operated.

In particular, QIA in charge of supervising IACUCs of each agency is required to operate the committee in a more objective and fair manner.

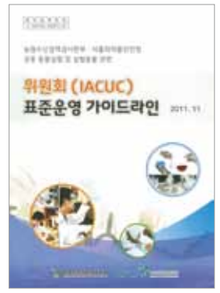
In 2011, IACUC in QIA has been reorganized to consist of 7 members for effective operation (4 external and 3 internal members). The committee was held 5 times in total (1 face-to-face, 1 in-writing and 3 electronic meetings). The use of experimental animals increased about 50% in 2010 because there had been an increase in research on vaccine development and improvement and additional animal experiment in the fisheries filed, following the integration of the agency.

2) Development and Distribution of Standard Operating Guideline of IACUC and Laboratory Animal Operating Committee

Different regulations led to the duplication of committees with similar members and functions, Institutional Animal Care and Use Committee (IACUC) and Laboratory Animal Operating Committee, causing inconvenience and burden. So we developed joint committee standard operating guidelines to devise standards and procedures for the establishment and operation of the committee.

The guideline included standards for animal experiment plans and facility assessment to promote consistency and provide accurate knowledge on animal experiment for committee members to utilize it as a manual, along with regulatory standards needed to establish and operate regulations or standard operation procedure (SOP) within animal experiment organizations.

Figure 2. Animal Experiment and Laboratory Animal Related Committee (IACUC) Standard Operating Guideline



3) Hands-on Workshop for Institutional Animal Care and Use Committee

From December 9 to 10, 123 committee members and researchers of IACUC by agency participated in the workshop on the subject of 'The actual practices of 3Rs and non-invasive in vivo imaging,' held at Hyeondae Seongwou Resort in Hoengseong, Gangwon-do.

4) Establishment and Operation of the National 3R Information Center

The QIA signed an MOU with Nicholas Cardinal Cheong Graduate School for Life of the Catholic University of Korea and the 3Rs Institute of Konkuk University for the establishment and operation of the National 3R Information Center.

It is aimed to collect and analyze the 3R-related information and educational resources and to distribute the materials to domestic animal experiment organizations and researchers.

※ What is 3Rs?
- Replacement: to replace animal experiments with inanimate system
- Reduction: to reduce the number of experimental animals as much as possible
- Refinement: to minimize the suffering of animals by improving animal breeding environment and animal experiment procedures

In addition, 'National 3R Information Center' signed MOUs on free provision of relevant information and personnel exchange with the Animal Welfare Information Center (AWIC) of United States Department of Agriculture (USDA), Johns Hopkins University of USA, the University of Edinburgh of UK and The Royal Society for the Prevention of Cruelty to Animals (RSPCA) to collect information from advanced countries and educate and train our staff.

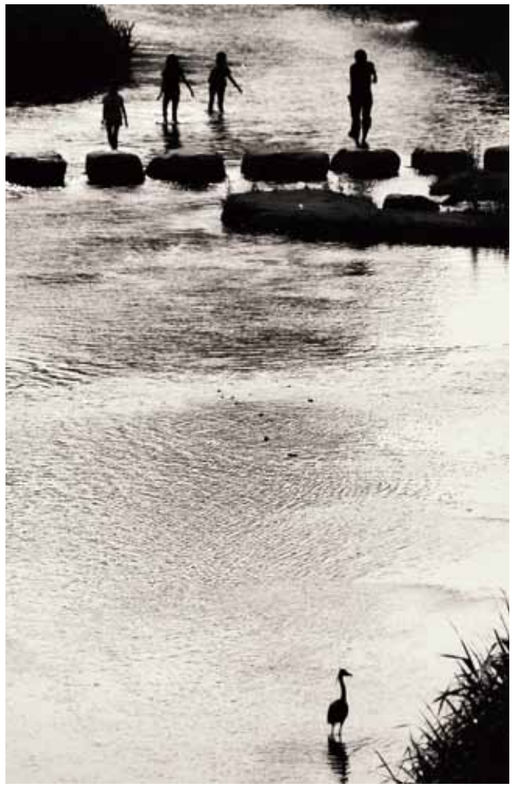
V. National Photo Contest on Animal Love

National Photo Contest on Animal Love has been held annually since 2007 under the theme of "the happy coexistence of humans and animals" to raise awareness of animal protection and welfare.

Among a total of 699 entries submitted in the 5th Animal Love Photo Contest from September 15 to October 23, 15 photographs were selected; the Grand Prix went to 'Where Have You Been?' (Oh, Changweon), the Best Prize to 'Face to Face' (Lee, Yongmin), Runner-up Prizes to 'Dancing with Squirrels' (Jeon, Gukhie), 'Troubled Youngest' (Lee, Myeonghyeon) and 'Oh My Dear' (Kim, Hyosuk) and 10 Participation Prizes were awarded.

You can find the winning photos on the QIA website and calendars have been produced and distributed using these photos. They will also be used for the promotion of our agency as well as animal protection and welfare.

Picture 2. The Grand Prix of the 5th Animal Love Photo Contest: 'Where Have You Been?' (Oh, Changweon)



08

Research and Development of Veterinary Science and Plant Quarantine Technology

1. Introduction
2. Major Research Results of Veterinary Science and Plant Quarantine Technology by Field

1. Introduction

For the veterinary science technology internationally recognized and practically applied, the R&D department of the Animal, Plant and Fisheries Quarantine and Inspection Agency (QIA) is making utmost efforts to strengthen the livestock disease prevention management system, reinforce the quarantine inspection technology of animals and livestock products, establish the sanitary management system of livestock products, control the quality of veterinary medicine and develop the animal protection and welfare technology.

In the recent rapidly changing domestic and international environment, Veterinary Science R&D department performed 149 projects in 2011. In particular, the research has been conducted under the 17 core projects selected in the fields of animal disease prevention and medicine development and zoonosis control.

The above projects have been carried out, with 35 policy proposals submitted, 70 standard technologies developed, 27 patents applied, 15 patents registered, 127 articles published in both national and international papers, and 246 academic presentations given.

In addition, the QIA patent technologies including disease diagnostic technology and preventive vaccines have been transferred to the industry so that the research results could be applied in the field. Also the contracts of KRW 96 million worth non-exclusive licenses have been signed, which is the highest level among organizations affiliated to Ministry for Food, Agriculture, Forestry and Fisheries (MIFAFF) except Rural Development Administration (RDA).

Considering the inevitable trend of market opening following the conclusion of Korea-US FTA, the QIA will continually pursue a variety of research to provide safe food to public by ensuring the safety of livestock and marine products as well as carrying out animal and plant disease prevention and pest control.

2. Major Research Results of Veterinary Science and Plant Quarantine Technology by Field

I. Research on Component Specification and Inspection Technology of Livestock Products

The accumulation of data through relevant research is required to set science-based standard specification for the operation of rational and harmonious processing standards and component specification of livestock products. To improve the credibility about the safety of domestic and imported livestock products, the research and development of science-based and globally recognized inspection technology for physicochemical and hygiene microbial composition specification are becoming more important.

1) Survey of Irradiated Livestock Products

2) Improvement of Vitamins Detection Methods in Infant Formula

3) Quantitative Risk Assessment of *Listeria Monocytogenes* in Livestock Products

4) Standardization of Korean Native Cattle Identification Test

5) Prevalence of Antibiotic-Resistant Bacteria Isolated from Imported Meats

6) Evaluation and Improvement of Microbiological Hygiene Quality of Eggs in the Market

II. Research on Toxicology and Residue Chemistry

1) Toxicology Research of Animals and Livestock Products

The Toxicology and Residue Chemistry Division has conducted the risk assessment of the toxicity of animals, livestock products and hazardous chemicals to provide scientific evidence for setting the safety management plan for hazardous chemicals and ensure safe livestock products for consumers. In 2011, five research projects were conducted with regard to the establishment of stem cells dedifferentiation to develop the alternative toxicity testing of veterinary drugs, epigenetics-induced neo-toxicological evaluation of hazardous chemicals, development of rapid separation and purification of mycotoxins using magnetic nanoparticles method, and quantitative risk assessment technology of hazardous chemicals of livestock products.

Above all, fat stem cells were isolated from fat tissues for the development of alternative toxicity tests of veterinary medicines and dedifferentiated stem cells were created with lentivirus by introducing dedifferentiating genes into mouse fibroblasts. By developing epigenetic toxicity assessment technology, the division evaluated the impact of chlorpyrifos-methyl on future generations recently emerging as major cause of physically abnormal conditions such as cancer and progeny stamping, which were difficult to be evaluated by the conventional toxicity detection method. By using dioxin residue survey data, the division also carried out the exposure assessment of the livestock products by age and identified the vulnerable groups and major exposed food, and transferred the mycotoxin purification technology to the industry using specific antibody of nanoparticle and mycotoxin developed by international collaborative research with Cornell University.

i) Development of stem cell model for toxicity evaluation using backward differentiation and adult stem cells
ii) Epigenetic evaluation on the toxicity of hazardous chemical residues in livestock products
iii) Simultaneous detection of mycotoxins and application of toxicosis specific biomarker using nanoparticle
iv) Commercialization of rapid purification kits for mycotoxins using nanoparticle and specific antibody
v) Development of methods for the risk assessment and risk profile of chemicals in livestock products

2) Residue Chemistry Analysis Technology and Residue Research

i) Monitoring of new MRL and risk veterinary drug residues in food of animal origin
ii) Development of liquid chromatography tandem mass spectrometry method for detection of anthelmintics and monitoring of its residues in food of animal origin
iii) Development of immunological rapid detection kits for the enrofloxacin and chloranphenicol residues in food of animal origin
iv) Development and application of liquid chromatography time-of-flight mass spectrometry method for the multi-residue screening of veterinary drugs in food of animal origin
v) Monitoring and development of analytical methods for pesticide residues in milk and eggs
vi) Survey of hazardous heavy metals in domestic and imported livestock products

III. Research on Statistical Control of Epidemiology and Outbreak Information of Animal Diseases

The Veterinary Epidemiology Division has conducted research projects regarding statistics management, epidemiological characterization, and risk assessment for a variety of animal diseases. In 2011, the division conducted a total of 5 research projects including 1 basic project, 3 priority projects, 1 international collaborative research project and provided epidemiological information required for the surveillance, prevention of animal diseases and pest control.

i) Epidemiological study on the preventive measures and evaluation of risk factors introducing foreign animal diseases via airport and seaport
ii) Disease reduction by evaluation of risk factors transmitting pathogens in poultry farms
iii) Establishment of foundation for study on cohort cattle, focused on brucellosis and tuberculosis
iv) Application of simulation program for outbreaks of foot-and-mouth disease and classical swine fever
v) Statistical analysis of livestock epidemics occurrence data and related epidemiological information

IV. Establishment of Animal Disease Diagnosis System & Effective Disease Surveillance

In 2011, the Animal Disease Diagnostic Division conducted 1 planning project, 5 priority projects, 8 basic projects and 1 industrial joint research project, to identify the current trends of animal disease outbreaks and the features of the microbial isolates and minimize the damage caused by disease outbreaks, for the establishment of animal disease diagnosis system and effective disease surveillance.

1) Control Strategy for Eradication and Stabilization of PRRS

2) Prevalence and Outbreak Patterns of Diarrheal Diseases in Korean Pig Farms

3) Analysis on Major Viruses of Arboviral Downer and Histopathological Examination of Its Legions

4) Monitoring of Korean Domestic Black Goat Disease

5) Establishment of Classification on Culicoides Biting Medges Transmitting Arbovirus in Cattle

6) Development of PCR Methods for Detection of *Actinobacillus Suis* and Selection of Effective Antimicrobials

7) Diagnosis of Cloven-Hoofed Animal Disease

8) Diagnosis of Avian and Other Animal Disease

9) Diagnosis of Companion Animal Disease

10) Diagnosis of Swine Disease

11) Survey of HPAI Infection Status in Wild Birds

12) Diagnosis and Serologic Test for Viral Animal Disease

13) Diagnosis and Serologic Test for Bacterial Animal Disease

14) Establishment of Supply Foundation for FMD Negative Animals and Evaluation of FMD Vaccine Efficacy

15) Commercialization of Genetic Diagnostic Kits for the Standardization of Bacterial and Parasitic Disease Diagnosis

V. Commercialization of Genetic Diagnostic Kits for the Standardization of Bacterial and Parasitic Disease Diagnosis

With the increasing interest on animal protection and welfare around the world, the ethical and scientific animal experimentation is required according to the 3 Rs principles: Replacement, Reduction and Refinement. In accordance with the 「Animal Protection Act」, which brings about the establishment and operation of animal experiment ethics committee, it is required to supervise the operating status of the committee and the welfare status of laboratory animals. Thus, the Animal Protection and Welfare Division conducted a research project on 'the Animal Welfare Survey of Animal Experiment Facilities'

1) Establishment and Operation of Institutional Animal Care and Use Committee in 2010

2) Animal Welfare Survey of Animal Experiment Facilities

VI. Development of Quality Control Technology of Veterinary Medicinal Products & Standardization Research

In 2011, in order to improve the quality of veterinary medicine, the Veterinary Medicine and Biologics Division performed a total of 5 research projects, including 'Research on equivalence and formulation assessment of veterinary generic drugs (2nd year)' to secure the equivalence of veterinary generic drugs and 'Risk profiling for developing mid- and long-term roadmap of veterinary antibiotics resistance risk assessment' to conduct veterinary antibiotics resistance risk assessment, 'Research on quality control standardization of veterinary herb medicines using Chromatographic pattern analysis (2nd year)' to establish the standards, specifications, and test methods of herb medicines by quality control standardization research of veterinary herb medicines using Chromatographic pattern analysis, 'Research on investigation of the overseas foot-and-mouth disease vaccine efficacy evaluation system and establishment of the Korean National Standard Assay' to investigate the overseas foot-and-mouth disease potency assay system and establishment of the Korean National Standard Assay to present the National Potency Assay Standard of FMD vaccine, and 'Research on usage status of domestically approved veterinary biologics and assessment information statistics analysis (2nd year)' to provide statistically analyzed materials related domestic veterinary biologics authorization and usage status.

The division carried out pharmacist monitoring collection inspection project for a total of 1,695 veterinary medicines (antibiotics, biologics, general formulation) as a part of post quality control to prevent the circulation of defective products, as well as performed national assessment (including national assessment exempted items and self-vaccine inspection) for 600 biologics as the proactive quality control of biologics of veterinary medicines. Furthermore, the division conducted FMD disinfectant efficacy assessment and the content examinations (108) after FMD occurred, and improved the quality control of veterinary medicine through 'Veterinary Medicine Research Club' from the previous year and newly established 'Biologics Technology Council'. It also reviewed and evaluated the safety and potency of veterinary medicines at the latest science level for the supply of safe and high-quality veterinary drugs, and continued the efficacy reassessment of veterinary medicines, such as re-evaluation of 170 items of Macrolide and 27 items of Newcastle vaccines.

Through the above research projects and quality control business, the division submitted 6 policy proposals, presented 2 standard technology utilizations and 14 research results in International Research Society and SCI Journal.

1) Generic Medicine Equivalence and Drug Evaluation

2) Profiling of the Mid- and Long-Term Roadmap Development for Antibiotic Resistance Risk Assessment

3) Standardization for the Quality Control of Herbal Medicines Using Chromatographic Pattern Analysis

4) Investigation of the Potency Assay System and Study on the Establishment of the Korean National Standard Assay for FMDV

5) Study on Statistical Analysis of Usage and Evaluation of Biologics in Korea

VII. Research on Bacterial Disease Control Technology

In 2011, the Bacterial Disease Division performed a total of 13 research projects, including 4 projects on the development of diagnosis and control technologies of zoonoses, 2 projects on antibiotics resistance and countermeasure research, 6 projects on technology development to resolve difficult disease problems in livestock farms and 1 project on commercialization of developed technology, and pursued domestic and overseas research cooperation and exchange projects. As a result, the division submitted 1 policy proposal, utilized 13 standard technologies, applied 2 patents and registered 2. Also for academic achievement, the division published 27 articles in professional scientific journals, including 13 SCI articles, delivered 29 scientific presentations in national and international conferences, carried out 32 technology promotions through a number of livestock related professional magazines and press releases. In order to strengthen the domestic & overseas research cooperation and exchanges, such as the operation of OIE reference laboratory for brucellosis, it signed an MOU with Mongolian Veterinary Institute and Tuberculosis Research Institute, thus promoted international collaborative research business for brucellosis. Furthermore, the division hosted 17 bacterial and parasitic diseases conferences, inviting 8 overseas guest speakers and 11 speakers from outside institutions to improve capabilities of researchers, with its laboratories applying and maintaining ISO/IEC17025 system. In addition, the division carried out training programs on the standardization of antibiotic resistant bacteria examination method and milk cow mastitis control measures for relevant city and provincial pest control agencies, operated the bovine disease expert council to develop research projects on field difficulties and technological demand, discuss the current issues and have hands-on experiences in the field. In addition, for the animal disease prevention, the division manufactured and distributed the Korean national standard diagnostic reagent and provided technical support for the technical review of veterinary medicines and the examination of the requested samples.

1) Development of Diagnostic Methods and Control Measures for Zoonoses

i) Development of rapid genetic differential diagnostic methods and molecular epidemiological analysis for *Brucella* isolates

ii) Study on improvement of diagnostic efficiency for conventional serological methods on false positive cattle in Brucellosis

iii) Selection of DNA vaccine candidates for canine brucellosis

iv) Management of OIE reference laboratory for brucellosis

2) Research on Antimicrobial Resistance in Animals

i) Establishment of the Korean Veterinary Antimicrobial Resistance Monitoring System

ii) Studies on resistance mechanisms and genetic relatedness of veterinary critically important antimicrobial resistant bacteria

3) Development and Application of Technology to Resolve Difficulties in the Livestock Industry Field

i) Study of non-specific positive reaction of bovine tuberculosis of cattle and farmed cervidae

ii) Distribution and molecular epidemiology of M. paratuberculosis in ruminants and wild boars in Korea

iii) Investigation and characterization of bacteria associated with diarrheal and respiratory disease in bovine and swine

iv) Study on improvement of *Actinobacillus pleuropneumoniae* inactivated vaccine

v) Prevalence of porcine proliferative enteropathy in Korea

vi) Prevalence of mycoplasmal mastitis in dairy cattle in Korea

4) Commercialization of Disease Diagnostic Kits and Prevention Technology

i) Commercialization of IFN-r diagnostic kits for bovine tuberculosis of farmed cervidae

VIII. Research on Viral Disease Control Technology

In 2011, the Viral Disease Division conducted research on animal disease control, zoonosis prevention, high-tech convergence technology development and climate change response animal disease control. To achieve this goal, a total of 16 research projects were conducted, including 1 core project, 3 international collaborative research projects, 8 priority projects, 2 planning projects, and 2 industrial joint research projects.

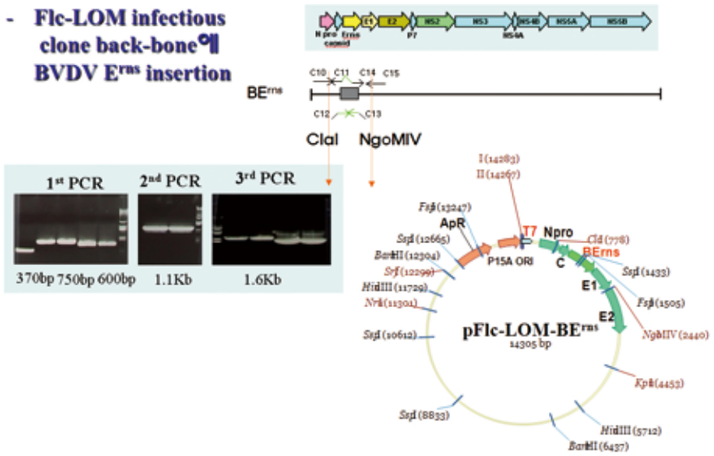
1) Core Projects

i) Development of cell lines for vaccine production incubating high-titer FMDV culture

2) Priority Projects

i) Establishment of diagnostic tools and prevention method for eradication of classical swine fever in Korea

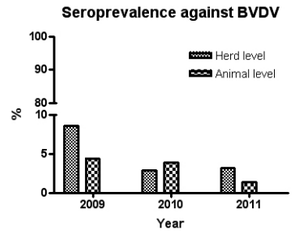
Figure 1. Flc-LOM-BErns Clone Production and Gene Recombinant Viruses Making Schematic Diagram



ii) Improvement of classical swine fever marker vaccine for immunostimulation

iii) Surveillance of pestivirus infection in domestic pig farms and development of differential diagnosis and prevention method

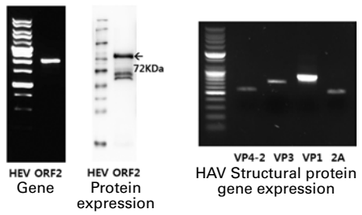
Figure 2. Annual BVDV Antibodies Positivity Rate Trend of Jeju Island Piggery



iv) Development of rabies bait vaccine in Korea

v) Development of viral hepatitis vaccines in swine

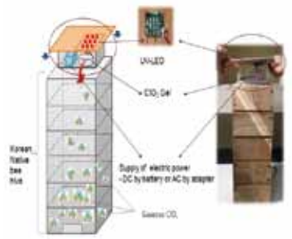
Figure 3.



vi) Development of pig Japanese encephalitis virus vaccine in response to global warming

vii) Control of sacbrood disease of honeybees and FMD using chlorine dioxide

Figure 4. Chlorine Dioxide Gas-Used Sacbrood Disinfection

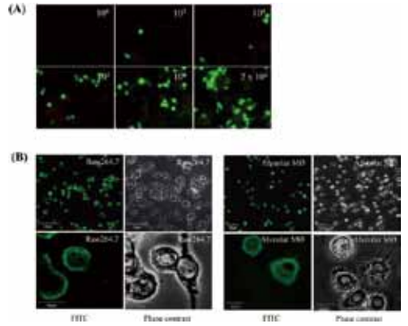


viii) Development of PRRS immunostimulation methods using high-density proteoliposomes

3) Planning Projects

i) Application of genome variation screening program for swine influenza virus and characterization and pathogenesis of SIV

Figure 5.

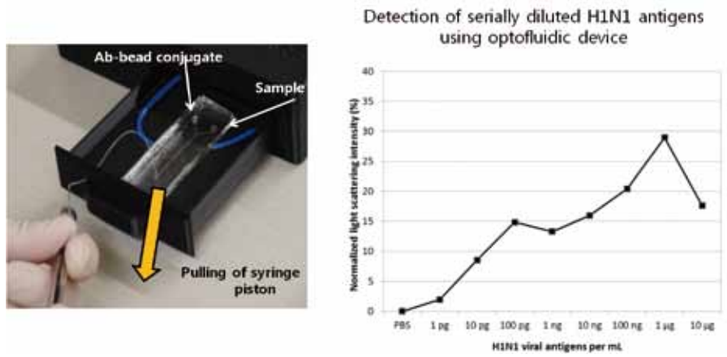


ii) Prevention of PCV2 transmission through semen

4) International Collaborative Research Projects

i) Development of lab-on-a-chip to detect infectious agents within barns

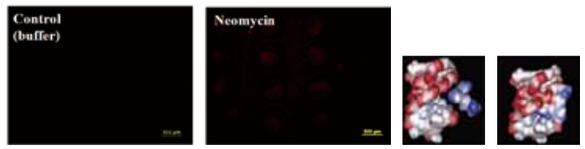
Figure 6. Handheld Optofluidic Device Used Influenza Virus Detection



ii) Development of rabies vaccine strains using reverse genetics vector system and recombinant viral vector

iii) Development and evaluation of highly selective and self-signaling colorimetric and amperometric polydiacetylene biosensors and sensor arrays for detection of animal diseases

Figure 7. PDA Microarray Used Neomycinedetection



5) Industrial Joint Research Projects

i) Commercialization of influenza A (H1N1) vaccine

ii) Improvement and commercialization of inactivated vaccines reinforced with bovine viral diarrhea virus genotype

IX. Research on Avian Disease Control Technology

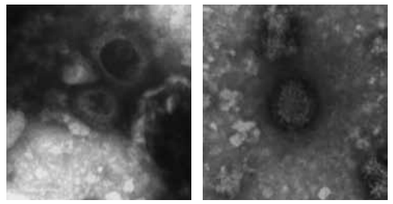
In 2011, the Avian Disease Division developed preventive measures against poultry disease causing damages in the field. In order to achieve the long-term goal of eradication of major poultry and aquatic animal disease, the division laid the foundation for effective and multifaceted prevention measures through international collaboration, monitoring, survey analysis such as characteristics research, diagnostics and prevention measure research. The division performed a total of 19 major national research projects, including 3 international collaborative research projects, 2 core projects, 10 priority projects, 1 industrial joint research project, 3 basic projects, among which 2 priority projects and 1 basic project were successfully completed.

1) Core Projects

i) Characterization of avian influenza viruses and relatedness among different animal sources

ii) Diagnostic antigen and immunogenicity for avian influenza viruses using baculovirus expressed proteins

Figure 8. H5 typeHA (left) and HA & M (right) Virus-Like Particles of Protein Electron Micrograph



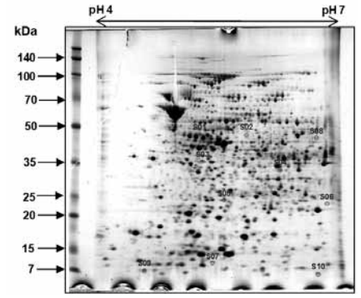
2) Priority Projects

i) Prevalence of significant poultry diseases on domestic broiler breeders

ii) Prevalence and characteristics of salmonella and campylobacter spp. isolated in chickens, domestic ducks and wild birds

iii) Molecular characterization and virulence analysis of Salmonella Gaillinarum

Figure 9. Probioticvaccine Strains 9R or Protein Spot of Outdoor Pathogenic Strains Lacking in SR2-N6 (S01-S10)



iv) Management of OIE reference laboratory for Newcastle disease

v) Development of recombinant marek's vector vaccine from Korean isolates of MDV

vi) Development of Newcastle disease marker vaccine strains for differentiating natural infection

vii) Development of infectious bursal disease vaccine using virus-like particle

viii) Development of Aeromonas hydrophila inactivated vaccine in Trionyx sinens

xi) Development of diagnostic method and inactivated vaccine for preventing edwardseillosis in farm-cultured eels

x) Survey of distribution and characterization of *Aeromonas sp.* isolated from freshwater fish farms and surrounding environment

3) International Collaborative Research Projects

i) Development of rapid detection method for salmonella using nanobiosensor and characterization of epidemic clones of salmonella enteritidis in the Korean poultry farming

ii) Comparative research on avian influenza and Newcastle disease viruses in Korea and Vietnam

iii) Molecular epidemiological research on avian influenza and Newcastle disease viruses in Korea and Cambodia

4) Industrial Joint Research Projects

i) Development and commercialization of spray-type live Newcastle disease vaccine strains using Korean isolates of Newcastle disease virus

5) Basic Projects

i) Study on prevalence and characterization of Korean Mycoplasma synoviae isolates

ii) Establishment of the Korean Veterinary Antimicrobial Resistant Monitoring System (KVARMS) for poultry

iii) Establishment of the sequence database for influenza virus

X. Research on Foreign Animal Disease Control Technology

The Foreign Animal Disease Division conducted a total of 7 research projects, including 1 core projects, 4 priority projects, 1 international collaborative research project and 1 basic project in 2011.

1) Core Projects

i) Development of cell bioassay for TSE diagnosis

2) Priority Projects

i) Monitoring and development of diagnostic methods for five viral equine encephalitis

ii) Surveillance method and infection status for Bluetongue in ruminants of Korea

iii) Characterization and pathogenesis of chronic wasting disease

iv) Diagnostics for poxvirus foreign infectious disease

3) International Collaborative Research Projects

i) Interspecies transmission of CWD: Transgenic mouse model studies

4) Basic Projects

i) Surveillance for important foreign animal diseases

XI. Research on Foot and Mouth Disease Control Technology

1) Core Projects

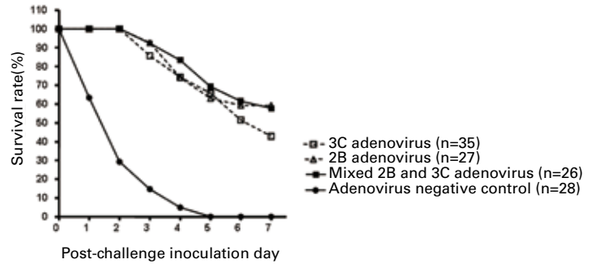
In 2011, the Foot-and-Mouth Disease Division performed a total of 7 research projects, including 4 core projects, 1 priority project, 2 international collaborative research projects.

i) Development of FMDV genetic resources and recombinant vaccine candidates

ii) Development of inactivated FMDV vaccine strains using FMDV serotype O (SEA topotype) from Korean isolates

iii) Evaluation and application of antiviral potency of FMDV inhibitor

Figure 10.



iv) Development of rapid assay to detect antibodies against FMDV serotype C and SAT 1,2,3

2) Priority Projects

i) Standardization of inactivation, concentration and purification of FMDV

3) International Collaborative Research Projects

i) Persistent infection defense mechanism of FMD using recombinant vector

ii) Pathogenesis and molecular epidemiology of FMDV isolated from Korea in 2010

XII. Collection and Management of Veterinary Genetic Resources & Veterinary Biotechnology Research

For the collection and management of veterinary genetic resources & veterinary biotechnology research, the Veterinary Biotechnology Division with 4 professional laboratories: Biological Safety Evaluation Laboratory, Nano-bio Laboratory, Pathogen Resources Laboratory and Parasite & Bee Disease Laboratory, conducted 4 core projects, 3 priority projects, 1 planning project, 1 international collaborative research project, 2 industrial joint research projects and 1 basic project as veterinary science technology development research projects.

1) Core Projects

i) Establishment, characterization and differentiation of embryonic stem cells derived from pigs

ii) Establishment of porcine mesenchymal stem cells culture and differentiation

iii) Isolation, characterization and clinical application of mesenchymal stem cells derived from dogs

iv) National survey of tick-borne diseases in domestic animals and molecular biological characterization of isolated pathogens

2) Priority Projects

i) Development of protein chip for pet disease diagnosis using biosensor

ii) Immunogenicity of toxoplasma antigen and improvement of diagnostic method

iii) Safety of animal reared with GM feed

3) Planning Projects

i) Control of sacbrood disease on the Korean native honeybees

4) International Collaborative Projects

i) Development of multiplex PNA chip and vaccine for food poisoning bacterial pathogens

5) Industrial Joint Research Projects

i) Disease control of canine influenza virus

ii) Development of detection kits for Ehilichiosis, Anaplasmosis, Leishmaniosis, Borreliosis

6) Basic Projects

i) Collection and preservation of veterinary genetic resources

XIII. Development Project of Plant Quarantine Technology

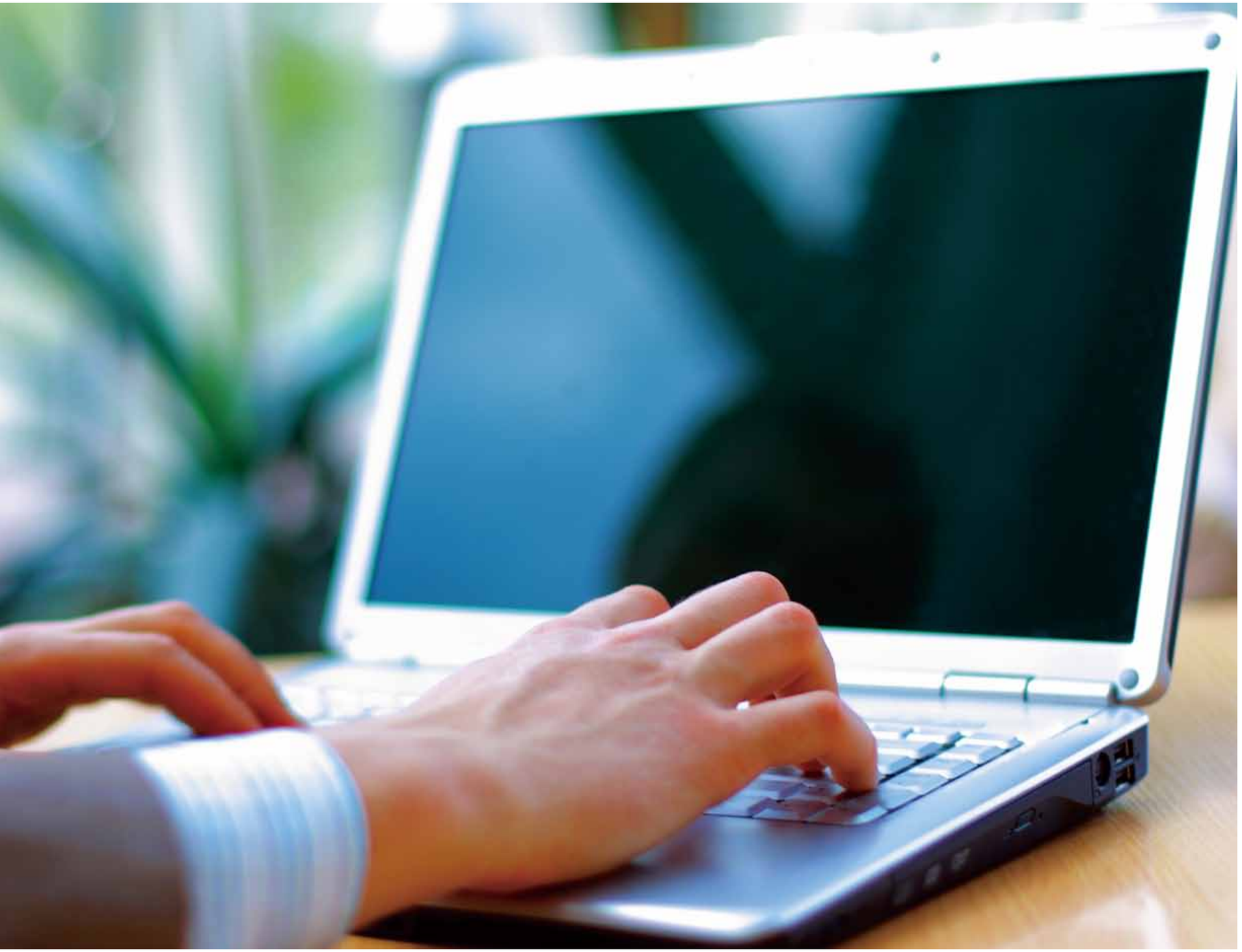
The Plant Quarantine Technology Center pursued research on hi-tech diagnostics and identification method of plant quarantine pests, climate change response technology development, and disinfection & information technology development. By sector, 13 projects on diseases, 10 projects on pests and 8 projects on disinfection and surveillance were conducted with 22 papers (including SCI) published, 17 standard technologies developed, and 8 industrial property rights applied.

1) Development of High-tech Inspection and Classification Methods of Insect Pests for Plant Quarantine

2) Development of Technology Responding to Climate Change

In order to develop prevention measures against pest inflow due to global warming, the center investigated the distribution of pests detected from imported portable plants (prohibited items), such as Mango (28 countries, 401 cases), Walnut (10 countries, 124 cases), and Mangosteen (9 countries, 43 cases), and the distribution of subtropical moth species in 7 regions of Jeju Islands and its 3 attached islands. It also investigated domestic and overseas examples of foreign pest inflow by species and by country, published a booklet on the analysis of introduction path to be utilized, and analyzed the transmission route and pattern of US fairy insects by using genetic markers (COI, CytB, etc.). It has also been conducting the analysis of group genetic relationship based on microsatellite markers. Furthermore, the center developed generation prediction system by collecting and analyzing ecological materials, such as parasitic range, optimum temperature for growth and the life cycle of fruit flies species: Ceratitis capitata, Bactrocera dorsalis, Bactrocera tryoni, Bactrocera cucurbitae, Rhagoletis indifferens, etc. for genotype comparison to estimate the moving path and movement pattern of US fairy insect, and currently progressing the analysis of group genetic relationships based on microsatellite marker. Also developed generation prediction system by collecting and analyzing the ecological materials such as parasitic range, optimum temperature for growth and life cycle of fruit flies species; Ceratitis capitata, Bactrocera dorsalis, Bactrocera tryoni, Bactrocera cucurbitae, Rhagoletis indifferens, etc.

3) Development of Disinfection and Information Technology



09

IT Information Business and Scientific Information Services

IT Information Business

1. Introduction
2. 2011 IT Information Business Results

Scientific Information Services

IT Information Business

1. Introduction

Following the integration of the QIA in 2011, there have been a lot of changes in information business as well. Previously, the business was operated separately by the 3 different organizations: National Veterinary Research & Quarantine Service (NVRQS), National Plant Quarantine Service (NPQS) and National Fisheries Products Quality Inspection Service (NFIS). After the integration, the information business has also been combined as the QIA Information Services, laying the foundation to operate the integrated agency by coordinating the information business implementation planning, performance indicators for business evaluation and budget.

In the organizational level, the administration information team was newly established in the Planning and Coordination Division for coordinating common projects in the information sector, the information management team in the Emergency Response Center for the information of animal disease control, the information team in the Plant Quarantine Center of the Department of Plant Quarantine for plant quarantine information and in the Fishery Products Quality Control Division of the Department of Fishery Products Quality and Safety for the information of fishery products inspection, respectively.

2. 2011 IT Information Business Results

I. The 3rd Establishment of Digital Integrated System for Animal Disease Control

In 2011, in order to build a high-tech IT-based advanced Animal Disease Control System as a phased control system, including border quarantine, domestic control and livestock farmhouse autonomous quarantine, we established the following systems: the integrated database with basic quarantine information on livestock-related people/vehicle and farm visitors, Geographic Information System (GIS) - based animal disease control and response system, the high-tech disease prevention and livestock field management system and the integrated border quarantine management system. During the 1st and 2nd projects to establish digital animal disease control system, we had recognized the importance of collection and implementation of quarantine basic information. Thus, in the 3rd project in 2011, we actually established and implemented the database of livestock farms/people, integrated the slaughter information in the livestock products safety management system of the QIA, systematically collected and classified the animal movement and farm visit information, and prepared for the enforcement of livestock vehicle registration system in 2012 by conducting pilot projects to investigate 500 animal transport vehicles, with the epidemiological linkage/collection system and GIS-based system, in order to provide the information as basic data for epidemiological survey in case of disease outbreaks.

II. Establishment of Border Quarantine Management System

The suspected causes of the three outbreaks of FMD in 2010 were foreign workers from FMD outbreak countries and farm owners who had been to those countries and reentered farms without proper disinfection. This indicated that it was necessary to establish a comprehensive management system for livestock-related people, including about 500,000 farmer and their families. Thus, we established a system to use livestock people information of the Korea Animal Health Integrated System (KAHIS) and shared information on their family members with the Ministry of Public Administration and Security (MOPAS)'s residents DB and changes in passports of livestock people in real time with the Ministry of Foreign Affairs and Trade (MOFAT)'s passport DB. We also provided local governments with the information on the disinfection of livestock people travelling FMD risk countries in real time, in order to encourage the governments to autonomously implement disinfection and education of the undeclared people who have been to disease outbreak countries.

III. Website Integration (www.qia.go.kr)

Since its launch, the QIA has set up an integrated webpage to effectively promote the image and vision of the newly established agency and increase the satisfaction of internal and external customers using the webpage.

IV. Plant Quarantine Integrated Information System

This business will be implemented stage by stage until 2014: the establishment of the plant quarantine integrated information system in Stage 1 in 2011, the establishment of the integrated information infrastructure in Stage 2 in 2012, the application of the plant quarantine integrated information system in Stage 3 in 2013, and the improvement of the statistical analysis and administration service in Stage 4 in 2014.

In 2011, several separate information systems, including the heat treatment operation information system, pest surveillance and control system and import-banned items traceability system, were integrated into a single system to ensure use-friendly access and save the cost of system development and management.

V. Salt Management System

Previously, salt had been classified as mineral under the supervision of the Ministry of Knowledge Economy (MKE). Later, it was reclassified as food, and the salt management was transferred to the Ministry for Food, Agriculture, Forestry and Fisheries (MIFAFF) on March 20, 2009. To improve and nurture the salt industry, the MIFAFF completely revised and enforced the Salt Management Act on August 11, 2010 and built the salt inspection data processing system through information business in 2011.

VI. Pilot Program of Electronic Phytosanitary Certificate Exchange with the Netherlands

Electronic Phytosanitary Certificate (EPC) is a written export certificate which is verified and exchanged electronically. We launched the pilot program of EPC mutual exchange, starting December, to investigate problems arising in the application by people in charge from both countries. ECP exchange will help to promote quarantine credibility between the two countries by preventing the loss and forgery of the certificate and to implement quarantine measures more effectively through rapid custom clearance by sharing the quarantine information in advance.

Scientific Information Services

Animal, Plant and Fisheries Quarantine and Inspection Agency (QIA) was launched on June 15, 2011 through the integration of three national quarantine services: National Veterinary Research & Quarantine Service (NVRQS), National Plant Quarantine Service (NPQS), and National Fisheries Products Quality Inspection Service (NFIS).

The Library of QIA is a professional library with a century-long history, starting as the library of formerly the Rinderpest Serum Manufacture Institute in 1911. It has collected and provided users with a variety of data from veterinary research papers in the Japanese colonial era to up-to-date domestic and foreign scientific information. It has also improved the preservation and utilization of data by acquiring the full text of self-published materials and building a database of multimedia information (video clips, photos, CD-ROMs).

For high-quality library services, it is operating various research information systems, such as book management program, multimedia system, e-book system, proxy system, integrated search tools and linking system, and providing academic support services, such as thesis support system and biological information system. Furthermore, it is trying to create a user-friendly search environment by securing scientific information contents, including e-journal, e-book and scientific DB as well as printed materials, and upgrading the system.

Table 1. Library Collection

(As of 31st December 2011)

Item	QIA Library Collection	Plant Quarantine Department Collection	Fishery Products Quality/Safety Collection	Printed Journal	E-Journal	AV Materials	Produced e-book	Purchased e-book	Web DB	News-paper
Quantity	37,391	20,318	3,532	101	7,550	2,538	378	1,352	10	24

Table 2. Library Full Text Database Construction

(As of 31st December 2011)

Item	Research Paper	Paper book	Report Release	Debrief	Patent Information	Master/ Doctorate Dissertation	VOD	CD-ROM	Slides	Newspaper information
Quantity	2,549	1,170	1,085	1,062	100	160	277	41 Kinds	13,086	35,474

Appendix

History

Personnel (Fixed/Current)

Organization

History

National Veterinary Research and Quarantine Service

Animal Quarantine Center

Jul 1909 Launched Cattle Quarantine Center for Export
Jun 1949 Established Busan Animal Quarantine Center of the Ministry of Agriculture
May 1962 Changed the name to National Animal Quarantine Center

Veterinary Research Institute

Apr 1911 Established Rinderfest Immune Serum Laboratory
May 1942 Changed the name to Veterinary Research Laboratory
Apr 1962 Incorporated into Rural Development Administration
Dec 1994 Change name to Veterinary Research Laboratory of Rural Development Administration
Feb 1998 Incorporated into Veterinary Research Institute of the Ministry of Agriculture
1 Aug, 1998 Animal Quarantine Center and Veterinary Research Institute were integrated into National Veterinary Research and Quarantine Service of the Ministry of Agriculture

National Plant Quarantine Service

Dec 1912 Started inspection of imported fruit trees and cherry trees
Jul 1959 Started plant quarantine service at all customs, cities and provinces in the country
Dec 1961 Enacted and proclaimed 「Plant Protection Act」
Sep 1967 Installed Plant Quarantine Division of the Ministry of Agriculture
Jan 1977 Installed Plant Quarantine Center (5 offices)
Apr 1978 Installed National Plant Quarantine Center (2 divisions, 5 branches)
Nov 2007 Raised to National Plant Quarantine Service (5 divisions, 5 offices, 2 management offices, 21 regional offices)

QIA 농림수산검역검사본부
2011 Integration

Three quarantine & inspection agencies were integrated into the **Animal, Plant and Fisheries Quarantine and Inspection Agency** in June 2011.

National Fisheries Products Quality Inspection Service

Jun 1906 Mokpo Chamber of Commerce, Started inspection of dried sardines.
Apr 1937 Fisheries Product Inspection Station of Japanese Government-General of Korea
Jun 1949 Central Fisheries Products Quality Inspection Station of the Ministry of Commerce and Industry (3 divisions, 16 branches)
Oct 1961 Central Fisheries Products Quality Inspection Station of the Ministry of Agriculture
Feb 1966 Central Fisheries Inspection Station of the Fisheries Agency of the Ministry of Agriculture
Aug 1996 National Fisheries Quality Inspection Station of the Ministry of Maritime Affairs and Fisheries
Mar 2001 National Fisheries Products Quality Inspection Station of the Ministry of Maritime Affairs and Fisheries (Launched Incheon International Airport Regional Office, 12 regional offices)
Mar 2006 Reorganized National Fisheries Products Quality Inspection Service of the Ministry for Food, Agriculture, Forestry and Fisheries

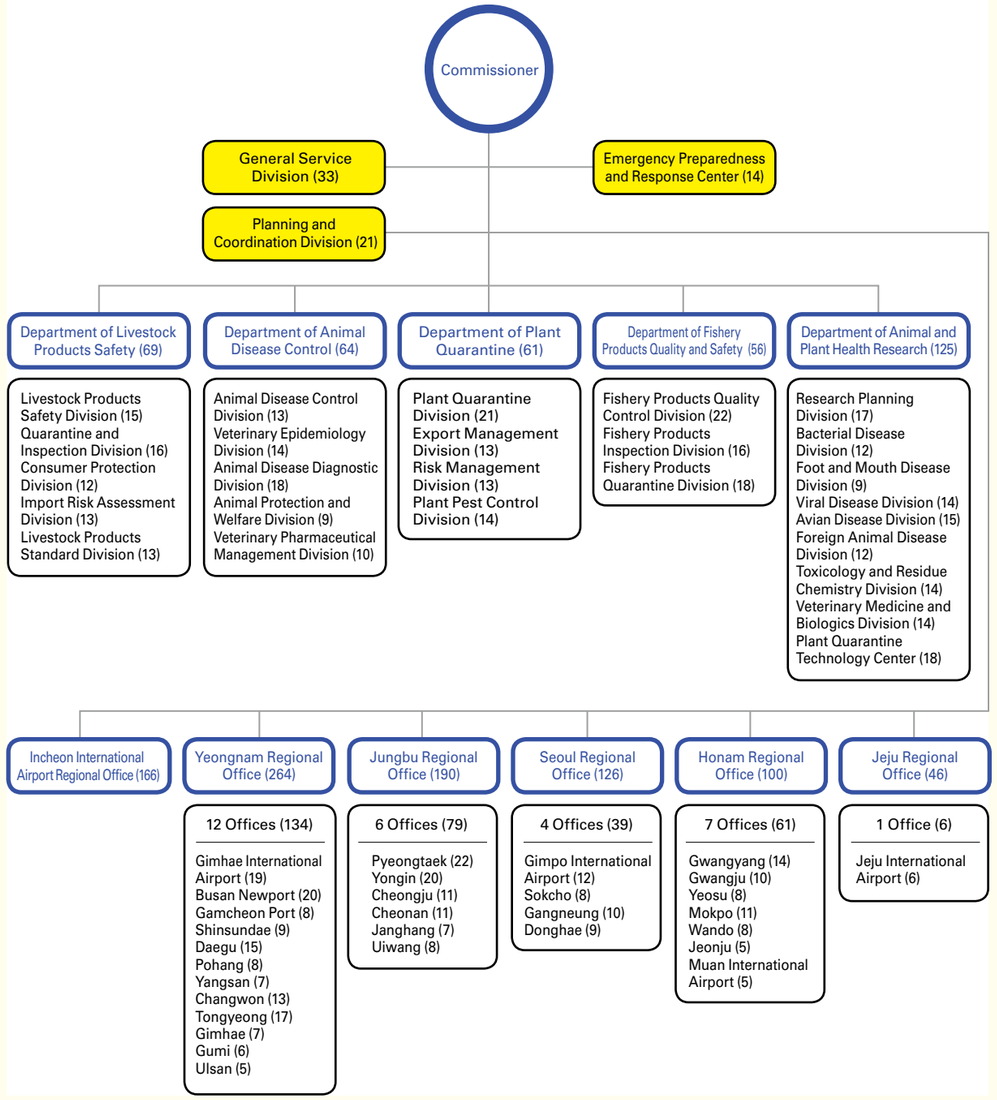
Personnel (Fixed/Current)

2011.12.31

Category	Content	Total	Political service	High level officials	3-4th grade	4th grade	4-5th grade	5th grade	6th grade	7th grade	8th grade	9th grade	Officials in special government service /contract service	Officials in technical service	Note (Research service)
Total	Fixed Number	1,335		8	2	36	14	127	372	371	155	10	16	106	118
	Current Numner	1,302		8	2	35	9	132	374	345	111	46	16	109	115

Organization

5 Departments, 29 Division, 6 Regional Offices, 30 District Offices / 1,335 people



Annual Report 2011

Animal, Plant and Fisheries Quarantine and Inspection Agency