



# ALWAYS DEPENDABLE

Agri-Food & Veterinary Authority of Singapore  
Annual Report 2009/2010



# Awards

## **ISO17025 SAC-SINGLAS ACCREDITATION AWARD**

Awarded to:

### **ANIMAL HEALTH LABORATORY**

since January 2005, with nine new tests accredited in FY2009

### **PLANT HEALTH LABORATORY**

since June 2005

### **VETERINARY PUBLIC HEALTH LABORATORY**

since 2000, with 12 new tests accredited in FY2009

### **POST-HARVEST DIVISION/MARINE FISHERIES RESEARCH DEPARTMENT**

Since 2002, continued accreditation in FY2009

## **ORANGE RIBBON AMBASSADOR AWARD 2009**

## **SHARE (Social Help and Assistance Raised by Employees) Programme 2009**

Gold Award

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## Vision

Safe food, healthy animals and plants for Singapore; trusted and respected globally.

## Mission

- Ensure a resilient supply of safe food;
- Ensure the health & safeguard the welfare of animals;
- Safeguard the health of plants;
- Facilitate agri-trade; and
- Nurture and inspire staff to be the best we can be!

## Values: “ExCITe”

*Excellence* : We strive to be the best in all that we do.  
We seek lifelong learning and continuous innovation.

*Care* : We value and nurture our staff.  
We care for the community and the environment.

*Integrity* : We serve with professionalism.  
We treat our customers fairly and honestly.

*Teamwork* : We trust and respect each other.  
We work as a team and partner our stakeholders to achieve our goals.



## Chairman's Statement

This year marked the 10th anniversary of AVA. Over the past 10 years, AVA made significant changes to better position the organisation to ensure food security and protect animal, plant and public health in Singapore. As we enter into the next decade, we have reviewed and refined the organisation's vision, mission and values to stay relevant and prepared to meet future challenges.

The organisation started this financial year with a new CEO, Ms Tan Poh Hong, taking over the helm. Under her strong and astute leadership, AVA moved forward with enhanced dynamism, and she led in the exercise to review and refine its vision, organisation structure as well as strategies and plans. The board is confident that AVA would scale greater heights under her leadership.

The threats of emerging diseases and food supply volatility in a rapidly changing landscape continued to test our ability to ensure a resilient supply of safe food, and protect animal, plant and public health in Singapore. Such threats will grow as globalisation brings with it increasingly rapid and widespread transboundary movement of animals, plants and food.

## Towards Organisational Excellence

In response to these challenges, AVA recalibrated its vision, mission and core values and re-aligned its organisational structure to better tackle the complexities and uncertainties occurring in the world today. It also sought to change and improve the way we work, tapping on new technology in areas such as agricultural production, disease diagnostics, and information and process management.

### **New strategic directions**

A good organisation is one that continuously works towards achieving excellence in all areas and strives to surpass expectations.

In its new vision, AVA has cast its sight to be a presence that is not only trusted and respected in Singapore, but also beyond our shores. That means benchmarking itself to the best in the world.

I commend AVA for its foresight in recognising that beyond its own efforts, it must also leverage on collaboration and partnership with a wider network of stakeholders and industry to achieve its vision. To set itself on its new course, AVA designed a new organisation structure that has a regulatory arm as well as an industry development and facilitating arm. It also moved towards greater stakeholder engagement and injecting a facilitator-developer outlook into the way it worked.

### **Dialogues with industry and other government agencies**

In line with its new direction, AVA initiated a series of dialogues with associations and companies over the past year. AVA used these platforms to update our stakeholders of new and pending guidelines as well as explored ways for AVA and them to collaborate on areas of mutual interest. Through the dialogues, AVA gained a better understanding of industry's needs and identified areas of mutual benefit for collaboration.

### **Building anticipatory capacity**

Horizon scanning and early detection of emerging risks could better enable AVA to anticipate threats and challenges in the areas of food safety, food supply as well as animal and plant health. In line with this, AVA has set up a dedicated horizon scanning and early alert division and also started work to establish new laboratory capability to identify early analytical signals, which might indicate the presence of uncommon or unanticipated contaminants. These new capabilities will increase AVA's decision-making space and the range of strategic options for responding to challenges.

## Strengthening Food Supply Resilience



### **Food Fund**

The high food inflation and supply crunch in 2008 heightened awareness of the threat of global food supply volatility, and the need for more emphasis on securing our food supply, given Singapore's unique situation of being a non-producer and price-taker. In addition to organizing food-sourcing missions and accrediting new supply sources, a Food Fund was established during the year to boost AVA's on-going efforts to strengthen food supply resilience through food source diversification and local farming. This is a major milestone, as the Food Fund would strengthen and support industry's efforts to develop viable new sources, and leverage on technology to maximise farm yield and productivity.

## Chairman's Statement



**The Fund would be used to encourage and support industry participation in the value chain process, from food production to post-harvest to import and distribution, such as in the development of overseas food zones and contract farming. The Singapore-Jilin Food Zone Project is a good example of how AVA can facilitate our private sector to develop alternative sources of supply for Singapore that carries our brand of high food safety standards.**

The Fund would be used to encourage and support industry participation in the value chain process, from food production to post-harvest to import and distribution, such as in the development of overseas food zones and contract farming. The Singapore-Jilin Food Zone Project is a good example of how AVA can facilitate our private sector to develop alternative sources of supply for Singapore that carries our brand of high food safety standards.

Even though local farming in Singapore is limited, our farms can still play a crucial role in bolstering our resilience in times of abrupt supply disruptions by serving as a “local stockpile”. Technology would be a key driver in raising the productivity of local food farms. The Food Fund would be used to assist local companies and farms to carry out research and development, leverage on technology to maximise usage of land, and upgrade and automate their farming processes to boost local production of eggs, fish and leafy vegetables. AVA is targeting for local farms to produce 30% of eggs, 15% of fish and 10% of leafy vegetables consumed in Singapore.

AVA continued to make progress in spearheading aquaculture development. Our efforts in selective breeding and hatchery technology resulted in the production of high quality fingerlings with faster growth rates and nearly 100% survival rates. Working closely with the private sector, AVA successfully tested and commissioned a newly completed large-scale fish nursery facility at Pulau Semakau, which included test-bedding of a batch of seabass fingerlings from AVA. Following this success, the farm would be commencing large-scale operations with a planned stocking of seabass at an even earlier life stage.

### **Consumer Education**

Through island-wide cooking demonstrations and competitions, AVA promoted frozen meat and liquid egg and egg powder to the public. Creating an awareness for the public to alternatives to chilled meat and shell eggs will help to minimise the impact of food supply disruptions on consumers.



## Ensuring Food Safety and Safeguarding Animal and Plant Health

Ensuring Food Safety and Safeguarding Animal and Plant Health

Thanks to AVA's robust food safety and disease control programmes, Singapore continued to enjoy safe food and remained free from major exotic animal and plant diseases of economic and public health significance.

In striving to counter threats to food safety, and risks of incursions of exotic animal and plant diseases, AVA continued to rely on science-based risk analysis to enhance risk management and emergency preparedness measures. At the same time, we also reviewed and updated our surveillance programmes to ensure they remained robust and relevant, while facilitating commercial trade.

With more countries assessed to be of negligible risk for rabies, AVA reviewed and revised its quarantine policy for dogs and cats. A new approach based on risk categorisation has provided for greater protection from rabies risks, while allowing more animals to be exempted from quarantine from certain countries at the same time.

In support of Singapore's efforts to host the inaugural Youth Olympic Games (YOG) in August 2010, AVA worked closely with the equestrian sector and the Singapore YOG organising committee to facilitate the import and quarantine of horses for the equestrian events at the upcoming YOG.

Even though international attention on bird flu has waned, AVA stayed vigilant against the ever-present threat of bird flu incursion. Besides maintaining our local biosecurity measures, we would continue to stay engaged with our neighbouring countries to keep the region safe from bird flu by providing laboratory and field diagnostic training to ASEAN member countries.

## Looking Forward

We have put in place sound and robust regulatory programmes, a new structure, and set of vision, mission and core values to guide and chart the course of the organisation, AVA is well prepared to meet the challenges of the next decade.

AVA will continue to build on its strengths and at the same time look into re-engineering its work processes and leverage on technology to optimise resources, improve efficiency and effectiveness, and enhance customer service. In moving towards a more facilitator-developer approach in working with our stakeholders, we will maintain the momentum of our industry dialogues, and look for ways to maintain high standards of food safety, and animal and plant health for Singapore in a less prescriptive manner.

## In Appreciation

I would like to take this opportunity to thank Minister Mah Bow Tan for his guidance and steadfast support, and the AVA Board members for their invaluable contributions in steering AVA towards the right direction.

I would also like to commend and thank the leadership and staff of AVA for their hard work and tireless dedication in ensuring a resilient supply of safe food and safeguarding animal and plant health for the nation.

**Koh Soo Keong**  
Chairman



# Board of Directors



Chairman  
**Mr Koh Soo Keong**

- Managing Director, EcoSave Pte Ltd
- Chief Executive Officer, KS Distribution Pte Ltd
- Executive Director, KS Energy Services Limited
- Director, Noel Gifts International Ltd
- Director, Zerust Singapore Pte Ltd
- Director, ECS Holdings Limited
- Director, Northern Technologies International Corporation
- Director, Medtecs International Corporation Ltd
- Director, ABL Asia Pte Ltd
- Director, Ascendas Funds Management (S) Limited



**Mr Chong Lit Cheong**

- Chief Executive Officer & Board Member, International Enterprise Singapore
- Chairman & Director, IE Singapore Holdings Pte Ltd
- Director, Changi Airports International Pte Ltd
- Director, Singapore Cooperation Enterprise
- Director, Business China
- Council Member, National Crime Prevention Council
- Councillor, South West Community Development Council
- Trustee, Asia Pacific Breweries Foundation
- Member, Advisory Board and Strategy Board of Lee Kong Chian School of Business, Singapore Management University



**Mr Frankie Chia**

- Managing Partner, BDO LLP
- Board Member, Asia Pacific Region, BDO International
- Member, Complaints and Disciplinary Panel of the Public Accountants Oversight Committee (ACRA)
- Panel Member, Strata Title Board



**Prof Zhou Weibiao**

- Director, Food Science and Technology Programme, Department of Chemistry, National University of Singapore
- Member, Nominations Advisory Committee, International Union of Food Science and Technology
- Member, Food Standards Committee, SPRING Singapore
- Member-at-large, Executive Committee, International Society of Food Engineering



**Dr Lee Tung Jean**

- Director, Energy Division, Ministry of Trade & Industry
- Council Member, Economic Society of Singapore





**Mr Huang Hong Peng**

- Deputy Chief Executive Officer, Food & Beverage, Fraser & Neave Ltd
- Director, Fraser & Neave Holdings Berhad Group
- Director, China Dairy Group
- Alternate Director, Asia Pacific Breweries Ltd
- Director, South Pacific Brewery Ltd
- Director, Myanmar Brewery Ltd



**Prof Satkunanantham  
s/o Kandiah**

- Director of Medical Services, Ministry of Health
- Chairman, Specialist Accreditation Board
- Registrar, Singapore Medical Council
- Professor, Department of Orthopaedic Surgery, National University of Singapore
- Board Member, GMS-Duke-NUS
- Board Member, National Environment Agency
- Director, MOH Holdings Pte Ltd
- Director, Temasia Health Pte Ltd
- Board Member, National Research Foundation
- Member, Bioethics Advisory Committee



**Ms Tan Poh Hong**  
(wef 21 May 2009)

- Chief Executive Officer, Agri-Food & Veterinary Authority
- Board Member, Singapore Corporation of Rehabilitative Enterprise
- Member, National Integration Working Group for Community
- Director, SEAFDEC Council Director for Singapore
- Chairman, Project Steering Committee of the AVA-TLL (Temasek Life Sciences Laboratory Ltd)



**Dr Chua Sin Bin**  
(till 20 May 2009)

- Chief Executive Officer, Agri-Food & Veterinary Authority
- Chairman, School of Chemical & Life Sciences Advisory Committee, Singapore Polytechnic
- Deputy Chairman, Food Standards Committee, SPRING Singapore
- Co-Deputy Chairman, Genetic Modification Advisory Committee of Singapore, Agency for Science, Technology and Research
- Member, National Advisory Committee for Laboratory Animal Research, Agency for Science, Technology and Research
- Member, Standards Council, SPRING Singapore
- Member, National Committee on Infectious Disease, Ministry of Health
- Member, Advisory Committee for Certification, PSB Certification
- Member, Expert Committee on Food Safety, Health, Welfare and Food Bureau, Government of the Hong Kong Special Administrative Region, The People's Republic of China

## Board of Directors



**Mr Cavinder Bull**  
(till 31 Mar 2010)

- Director, Drew & Napier LLC
- Member, Law Reform Committee, Singapore Academy of Law
- Director, Singapore International Arbitration Centre
- Board of Trustee, Singapore University of Technology and Design
- Director, National Healthcare Group Pte Ltd
- Director, Singapore Technologies Electronics Limited



**Dr Ngiam Tong Tau**  
(till 31 Mar 2010)

- Executive Vice-President, United Engineers Ltd
- Chairman, Genetic Modification Advisory Committee of Singapore
- Chairman, Advisory Committee Food Industry Research Center, Singapore Polytechnic
- Director, Board of Wildlife Reserves Singapore Pte Ltd
- Director, Temasek Life Sciences Laboratory Ltd
- Director, Oceanus Group Limited
- Member, Tropical Marine Science Institute Management Board, NUS
- Member, Advisory Panel, Applied Science Department, Temasek Polytechnic
- Director, Zagro Asia Limited



**Mr Tan Kian Chew**  
(till 31 Mar 2010)

- Group Chief Executive Officer, NTUC FairPrice Cooperative Ltd
- Chairman, NTUC Foodfare Co-operative Ltd
- Chairman, NewFront Pte Ltd
- Director, NTUC FairPrice Foundation Pte Ltd
- Director, ARA Trust Management (Suntec) Ltd
- Director, The Consumer Goods Forum, Paris



**Mr Alan Lee Ah Sim**  
(till 31 Mar 2010)

- Managing Partner, August Consulting Pte Ltd
- Director, Raffles Capital Pte Ltd



**BG (Dr) Benjamin Seet Hun Yew**  
(till 31 Mar 2010)

- Chief of Medical Corps, Singapore Armed Forces
- Consultant, Ministry of Health
- Board Member, Health Promotion Board



**Mr Yeo Guat Kwang**  
(wef 1 April 2010)

- Director, Quality Worklife & All Nationalities, NTUC
- President, Consumers Association of Singapore (CASE)
- Executive Secretary, Amalgamated Union of Statutory Board Employees (AUSBE)
- Co-Chairman, GEMS UP/ Customer Centric Initiative Working Committee, SPRING Singapore
- Co-Chairman, NTUC-SNEF Migrant Workers' Forum
- Co-Chairman, National Tripartite Committee on Workplace Health
- Vice-Chairman, Aljunied Town Council
- Vice-Chairman, North-East Community Development Council
- Patron, Pets Enterprise & Traders Association
- Member, PUB Board of Directors
- Member, The Workplace Safety & Health Council
- Member, Standards Council, SPRING Singapore
- Member, Tripartite Committee on Employability of Older Workers
- Member, Tripartite Committee on Portable Medical Benefits
- Member, Institute for Service Excellence@SMU (ISES) Governing Council



**COL (Dr) Kang Wee Lee**  
(wef 1 April 2010)

- Chief Naval Medical Officer, Ministry of Defence



**Mr Peter Chia**  
(wef 1 April 2010)

- Chief Operating Officer, Temasek Life Sciences Laboratory Limited



**Mrs Lee Ai Ming**  
(wef 1 April 2010)

- Partner, Rodyk & Davidson LLP
- Independent Director, Keppel Land Ltd
- Independent Director, K-Reit Ltd
- Independent Director, HTL Holdings Ltd
- Member, Singapore Copyright Tribunal
- Vice-President, Asian Patent Attorneys Association



**Dr Azlinda Anwar**  
(wef 1 April 2010)

- Scientist, Duke-NUS Graduate Medical School
- Member, Censorship Review Committee 2009, Ministry of Information Communications and the Arts

# Senior Management



**Ms Tan Poh Hong**  
Chief Executive Officer  
(from 21 May 2009)



**Dr Chua Sin Bin**  
Chief Executive Officer  
& Director - General,  
Agri-Food & Veterinary Services  
(till 20 May 2009)



**Dr Chew Siang Thai**  
Deputy CEO, Regulatory  
Programmes  
& Operations Group  
Director- General,  
Agri-Food & Veterinary Services



**Dr Yap Him Hoo**  
Ag Director,  
Regulatory Administration  
Department

**Key responsibilities:**

- Regulatory administration
- Quarantine and inspection
- Food establishment regulation
- Agri establishment regulation
- Laboratories management

**Key responsibilities:**

- Regulatory programmes
- Risk analysis and standards
- Accreditation management
- Investigation and prosecution



**Dr Astrid Yeo**  
Director,  
Quarantine &  
Inspection Department



**Ms Seah Huay Leng**  
Director,  
Food Establishment  
Regulation Department

**Key responsibilities:**

- Import and export regulation
- Consignment inspection
- Quarantine management

**Key responsibilities:**

- Site assessment and licensing
- Food surveillance and compliance
- Audit and extension services



**Dr Wong Hon Mun**  
Director,  
Agri Establishment  
Regulation Department



**Dr Paul Chiew**  
Director,  
Laboratories Department

**Key responsibilities:**

- Veterinary and farm licensing
- Farm surveillance and inspection
- Animal welfare and control

**Key responsibilities:**

- Veterinary public health laboratory services
- Animal and plant health laboratory services



**Mr Loy Wei Sun**  
 Director,  
 Corporate Services Department  
 (till 29 Mar 2010)

**Key responsibilities:**

- Corporate development
- Financial administration
- Office administration
- Information services



**Ms Joyce Ng**  
 Director,  
 Corporate Resource  
 Management Department  
 (from 30 Mar 2010)

**Key responsibilities:**

- Finance administration
- Human resource management
- Information services
- Office administration and facilities management



**Dr Tan Lee Kim, Kim**  
 Ag Director,  
 Planning & Organisational  
 Excellence Department

**Key responsibilities:**

- Strategic planning
- Organisational Excellence
- Horizon scanning and early alert



**Dr Choo Li Nah**  
 Director,  
 Communications & Corporate  
 Relations Department

**Key responsibilities:**

- Customer relations
- Media management
- Community outreach and publications
- International relations



**Mr Leslie Cheong**  
 Director,  
 Special Duties

**Key responsibilities:**

- Food supply resilience projects
- Aquaculture infrastructure



**Dr Philip Chew Hong**  
 Director,  
 Technology & Industry  
 Development Department

**Key responsibilities:**

- Technology research and development
- Industry facilitation
- Food supply chains



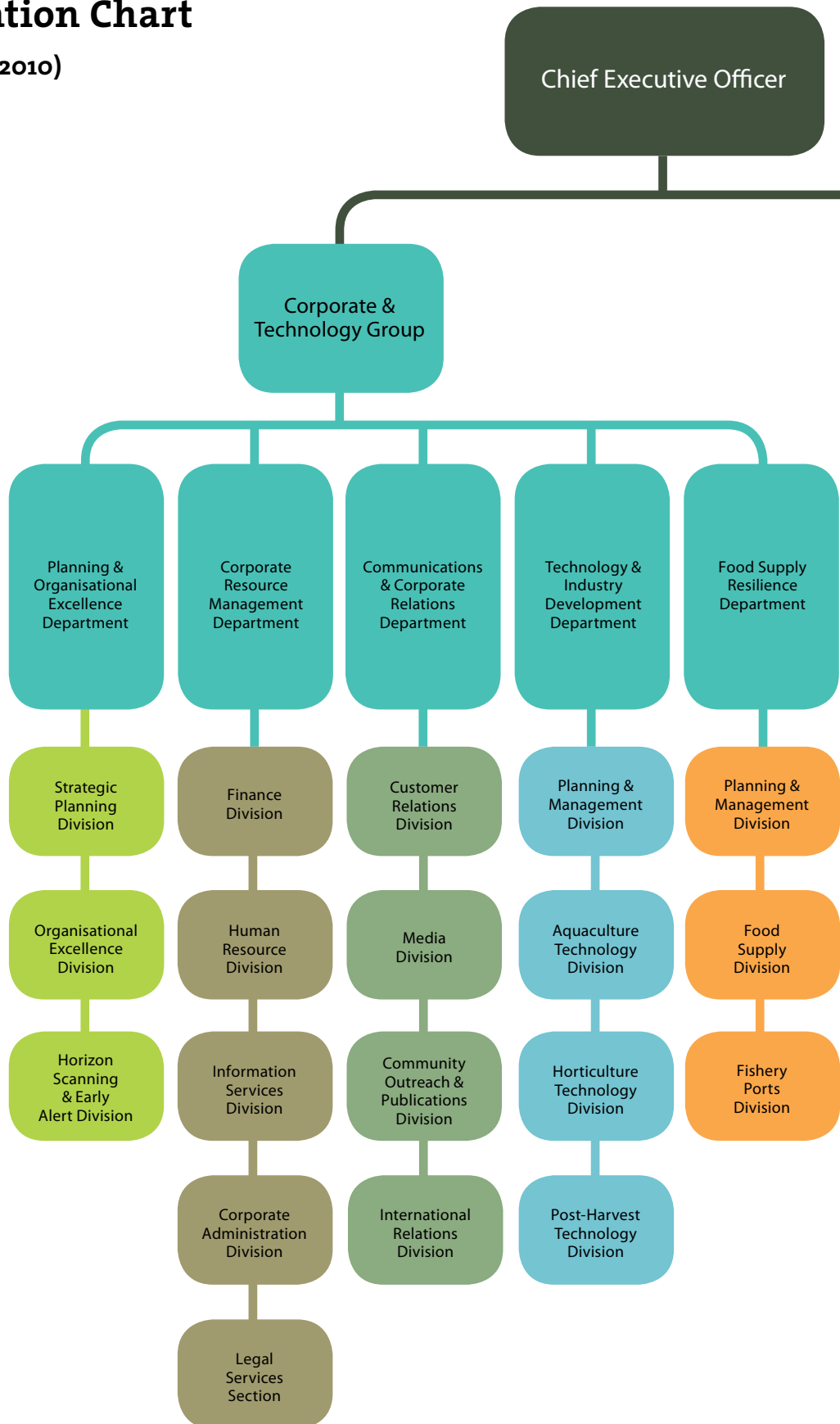
**Ms Tan-Low Lai Kim**  
 Ag Director,  
 Food Supply  
 Resilience Department

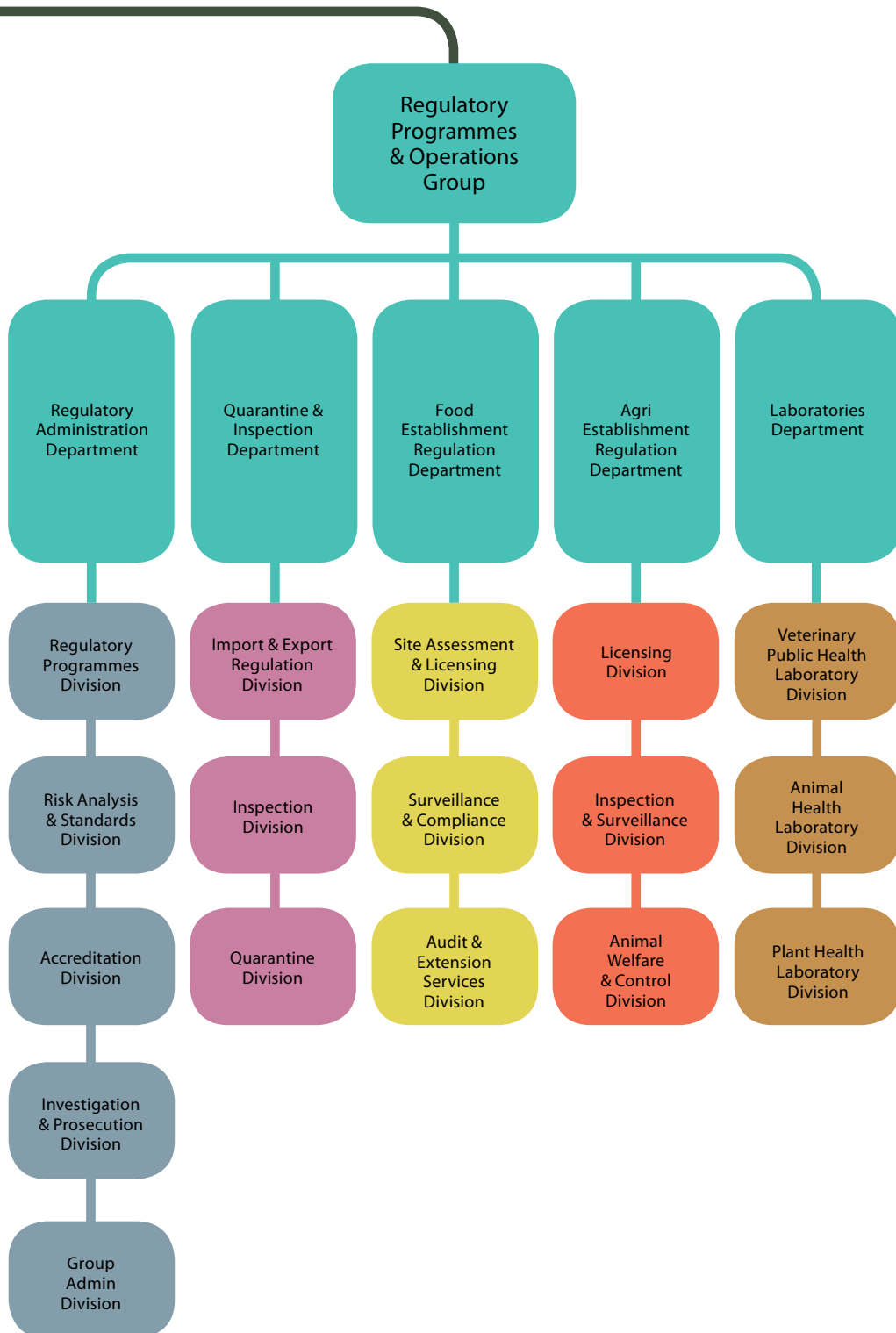
**Key responsibilities:**

- Food supply initiatives
- Agri-trade facilitation
- Fishery ports management

# Organisation Chart

(from 1 April 2010)







# Calendar of Events

## April 2009

On 1 April, AVA's revised import and quarantine requirements for cats and dogs came into effect. The revised policy reclassified countries based on their rabies incidence, disease control, use of rabies vaccination and rabies antibody serology for protection of the animals against the disease.

## May 2009

AVA supported the 11th AQUARAMA held from 28 to 31 May which was opened by Dr Mohamad Maliki Bin Osman, Parliamentary Secretary, Ministry of National Development. More than 160 exhibiting companies from 23 countries participated in the trade show. AVA's display booth in the Singapore Pavilion showcased its achievements and recent developments.

## July 2009

AVA's Food Safety Awards Night was held on 31 July. Minister for National Development, Mr Mah Bow Tan, graced the event.

## August 2009

AVA formed an Advisory Committee on the Evaluation of Health Claims in August to establish a framework and principles to guide industry members for the evaluating of such claims.

## September 2009

AVA participated in the National Innovation and Quality Circle (IQC) held from 23 to 25 September where four of its Work Improvement Teams (WITs) received the Gold, Silver and Bronze Awards for their FY2008 projects.

AVA kicked off a series of Chinese and Malay cooking demonstrations held at various community centres to raise awareness of frozen meat amongst the heartlanders.

## October 2009

AVA organised the 7th Meeting of the ASEAN Expert Group on Food Safety (AEGFS) held from 13 to 15 October. The Meeting was attended by delegates from Brunei Darussalam, Cambodia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore and Thailand as well as representatives from the ASEAN Secretariat from the Food and Agriculture Organisation and the Australian Marine Science and Technology Limited.

AVA CEO, Ms Tan Poh Hong led a delegation to Indonesia from 19 to 21 October to hold discussions with officials from the Indonesian Ministry of Marine Affairs & Fisheries as well as Ministry of Agriculture. This official visit aimed to strengthen cooperation in enhancing food supply from Indonesia to Singapore.

The Frozen Meat Culinary Challenge, an islandwide frozen meat cooking competition, culminated in the finale held on 25 October. The event was officiated by Senior Minister of State for National Development and Education, Ms Grace Fu.

## November 2009

The Parliamentary Secretary for National Development, Dr Mohamad Maliki Bin Osman led a delegation of MND and AVA officers to attend the 31st Meeting of the ASEAN Ministers Meeting on Agriculture and Forestry (AMAF) and 9th Meeting of the AMAF+3 held in Bandar Seri Begawan, Brunei Darussalam on 10 and 11 November, respectively.

A series of three Responsible Pet Ownership roadshows were held at the West Coast, Leng Kee and Anchorvale Community Centres in November with the theme of "Be a Considerate Pet Owner". Mr S Iswaran, MP for West Coast GRC and Dr Mohamed Maliki bin Osman, Parliamentary Secretary for National Development were the Guests of Honour for the first and last roadshows respectively. An estimated 1,500 visitors attended the roadshows.

The Plant Containment Facilities at the Plant Health Laboratory, equipped with safeguards for the processing of samples for exotic plant pests, began operation.

## December 2009

The Minister for National Development, Mr Mah Bow Tan, launched AVA's Food Fund on 10 December. This fund was set up to strengthen AVA's strategies to diversify sources and raise local farm production.

## January 2010

On 11 January, AVA and Temasek Life Sciences (TLL) signed a new 5-year contract to continue with the second phase of the foodfish selective breeding project. This project aimed to establish a higher growth rate of the Asian seabass.

Compulsory formal training was introduced to the pet retail industry to further improve the standards of animal welfare and professionalism in pet shops and pet farms.

AVA hosted the 14th Meeting of the Expert Working Group on the Harmonisation of Maximum Residue Limits (EWG-MRLs) of Pesticides Amongst ASEAN countries.

## February 2010

AVA together with the Intellectual Property Office of Singapore (IPOS), the Ministry of Agriculture, Forestry and Fisheries (MAFF) of Japan jointly organised the Business Awareness Seminar on Plant Variety Protection from 25 to 26 February under the auspices of the East Asia Plant Varieties Protection (EAPVP) Forum.

## March 2010

AVA launched its Food Supply Resilience Public Education Programme on Egg Powder and Liquid Egg on 17 March at the Temasek Culinary Academy (Temasek Polytechnic). Senior Minister of State for National Development and Education, Ms Grace Fu, was the Guest of Honour.

A pilot trial to test a Technical Reference, the TR-24, on Cold Chain Management of Vegetables was implemented in March. In a joint collaboration, AVA, SPRING Singapore and the industry developed the TR-24 to meet the increasing demand for value-for money agri products known for safety, freshness and quality.



## Food Supply

# AVAILABLE

By proactively identifying and diversifying food sources, AVA enhances the long-term resilience of our food supply to ensure that safe and quality food is continuously available to Singaporeans at stable prices.





## Food Supply

### Enhancing Food Supply Resilience

AVA adopts a diversification strategy to ensure a resilient supply of food for Singapore. AVA approves as many sources in as many countries as possible from which our importers can bring in food, as long as the food complies with Singapore's food safety requirements. AVA also collaborates with the industry and facilitates their efforts in food sourcing to bolster food supply resilience.

AVA further assists potential sources to meet our food safety requirements and supply to Singapore through technology development and transfer. At the same time, we seek to enhance the productivity of local farms through R&D and capability development. Additionally, AVA encourages the industry and consumers to use alternative forms of food products where supply sources are limited or vulnerable to supply disruptions.

## Diversifying Food Sources

### Food Sourcing Missions

During the year, AVA continued to enhance cooperation to increase and diversify Singapore's food sources. Together with IE Singapore, several food sourcing missions and study trips were organised for our food business clusters.

### Vegetables and Fruits

Vegetables and fruits sourcing and study missions were mounted for Indonesia, China, Cambodia, Israel and Australia in FY2009. The mission to Yunnan and Sichuan in June 2009 raised awareness of agri-business opportunities and common challenges faced by companies in China. In the same month, a study mission was carried out to find out more about Cambodia's pro-business initiatives and explore opportunities for fruits and vegetables contract farming in Cambodia. An agrotechnology business mission to Israel in January 2010 helped participants gain a greater understanding of the technological developments in Israel's agriculture industry, and provided contacts for the provision of turnkey solutions in farming and fertigation equipment.



During a visit to Western Australia (WA) in March 2010, the delegation comprising vegetables and fruits importers, local farmers and machinery supplier explored potential trade opportunities and studied the technology adopted by their farms. The delegation found that WA was a safe and reliable source of vegetables and fruits, especially in times of supply disruptions, given its proximity, availability of sea and air freight transportation, and high food safety and quality standards. The mission was also significant in reinforcing existing, and establishing new contacts of suppliers for exports of fresh produce into Singapore.

### Seafood

Seafood sourcing missions to India and Indonesia were conducted in September and October 2009 respectively. During the Indian mission, participating companies learnt about the types and quality of seafood in Chennai, Tuticorin, Kochi and Mumbai and signed contracts for shipments of Indian seafood products. Local seafood companies attending a seafood exposition in Batam were introduced to fishery products and fishing technology in Indonesia as well as its commercial fishing and aquaculture investment opportunities.

At a briefing facilitated by AVA in January 2010, participating industry players gained a better understanding of the state of fishery developments in the Riau Islands Province, and the investment opportunities on capture fisheries and aquaculture that are available.



### Promoting Vegetable Supply from Indonesia

In collaboration with relevant stakeholders, such as trade associations, retailers and the Embassy of Indonesia, AVA organised various activities during the year to promote the supply of vegetables from Indonesia.

#### Vegetable and Fruit Fairs, Business Forums and Trade Missions

The 3rd Indonesian Vegetable and Fruit Fair cum Business Seminar held in May 2009 attracted 250 participants and 21 exhibitors showcasing a wide range of high quality fresh fruits and vegetable produce from Indonesia.

Apart from providing an invaluable business networking opportunity for suppliers and buyers, the event enabled the sharing and exchange of knowledge and information among stakeholders.

Trade missions were subsequently organised for local importers to explore the potential of Central and West Java to supply vegetables and fruits to Singapore. A trade mission to Central Java in July 2009 led to orders for potato, capsicum, and other types of vegetables and fruits from the Indonesian exporters. In November 2009, an AVA-led delegation participated in an international trade exposition in Bandung, during which AVA's collaboration projects on transfer of agritechology to Indonesia was showcased, and traders shared their experiences, expectations and requirements for export to Singapore. At another business matching forum organised in January 2010, Indonesian vegetable exporters were linked with Singaporean importers, with plans to increase the export of vegetables from Indonesia to Singapore.



AVA also worked with local retailers to raise consumer awareness of, and demand for various types of Indonesian vegetables and fruits. An "Indonesia Istimewa Fair" held in over 60 NTUC FairPrice supermarket outlets from 27 August to 2 September 2009 to promote Indonesian vegetables and fruits, drew good response from consumers.

#### Official Visits

To further strengthen cooperation in enhancing food supply from Indonesia to Singapore, CEO, AVA led a delegation to Indonesia in October 2009 to hold discussions with agriculture and fisheries officials in Jakarta. Visits were also made to vegetable farms and processing centre in West Java that supply a wide range of good quality fruits and vegetables for the Singapore market. Given the capacity of these establishments to further increase their export to Singapore, West Java has the potential to become a major supplier of fruits and vegetables.

Six agriculture officials led by the Head of Agriculture Department of Central Java visited Singapore in December 2009 to familiarise themselves with the Singapore vegetable industry and market requirements. Besides visits to a local vegetable farm, a seed supply company and the NTUC Fresh Food Distribution Centre, the delegation also observed our vegetable inspection process at Pasir Panjang Wholesale Centre. There is potential for Central Java to export cabbages, potatoes, chillis and fruits like salak to Singapore.

## Food Supply



### AVA's Food Fund

Our effort to strengthen food supply resilience was given a significant boost with the establishment of a Food Fund. Launched on 10 December 2009 by the Minister for National Development, Mr Mah Bow Tan, the Food Fund was set up to strengthen our strategies to diversify sources and raise local farm production. With a first year funding of \$5 million, the Food Fund sought to support the diversification of overseas food sources, and food capability development to maximise the productivity of local vegetable, foodfish and egg farms.

The Fund would be used to co-fund feasibility studies on overseas food zones, contract farming, and sourcing from non-traditional sources. In co-funding food capability development projects, the fund would support R&D projects on sustainable fish and vegetable farming systems, fish breeding, vegetable variety testing, seed banking, post-harvest handling and poultry waste

management. The focus for farm capability upgrading projects is primarily on automation, mechanisation, technology application, marketing and branding, and intellectual property acquisition and registration.

At the close of the first call for applications in March 2010, a total 48 applications were received. Proposals were being evaluated on their potential to supply Singapore with safe and resilient supply of food from an alternative source, and to use farming technology to maximise local farm production.

### Facilitating Food Imports

#### Accreditation Of Sources

With increased number of applications received from new countries to export meat and meat products to Singapore, AVA adopted a risk-based approach to facilitate the accreditation of sources which enabled AVA to optimise the use of resources without compromising food safety. Countries with credible food safety and animal health systems, and an export history of products to third countries were placed on a fast-tracked accreditation route. Establishments in such countries, commonly from Europe or America, were pre-listed to export specific lower-risk products to Singapore. Subsequently, audit inspections were performed on the establishments that were actively exporting to Singapore.

In addition, AVA proactively contacted the authorities of new potential source countries interested to export meat, processed meat and processed egg products to Singapore for the required information for accreditation.

#### Resumption of Beef Exports

In FY2009, AVA approved the resumption of beef exports from Canada and Japan following a thorough documentary evaluation and on-site verification inspection of their risk management measures for bovine spongiform encephalopathy.



## Promoting Alternatives Through Consumer Education

Singapore has limited sources for chilled meat and shell eggs. To enhance food supply resilience, AVA continued to educate consumers on alternative food sources. During the FY, efforts were made to raise the awareness on the use of egg powder and liquid egg as an alternative to shell eggs. AVA also continued with our public education programme on frozen meat to encourage consumers to take to this value for money alternative.

### Frozen Meat

A series of Chinese and Malay cooking demonstrations were held at various community centres for more than 500 participants during September and October 2009. Participants picked up tips on buying, storing, handling and using frozen meat from celebrity chefs such as Chef Peng Yu Yun, Chef Huang Qing Bao and Chef Asmah Laili. Surveys were also conducted to gather consumers' perception on frozen meat. Cooler bags were given away to encourage survey participation.

An islandwide frozen meat cooking competition, the Frozen Meat Culinary Challenge, culminated in a finale on 25 October 2009 at Junction 8 Open Plaza. The event, graced by Senior Minister of State for National Development and Education, Ms Grace Fu, saw an attendance of more than 200 people.



### Egg Powder and Liquid Egg

AVA launched its Food Supply Resilience Public Education Programme on Egg Powder and Liquid Egg on 17 March 2010 at the Temasek Culinary Academy (Temasek Polytechnic). The programme aims to raise awareness among consumers on alternatives to shell eggs so that consumers will be more receptive to alternatives in times of supply disruption.

The launch event was graced by Senior Minister of State for National Development and Education, Ms Grace Fu and was attended by representatives from the retail sector, trade councils, suppliers and local media. At the event, AVA gave a presentation on the origins, production process, benefits and tips on storage and handling of egg powder and liquid egg. A cooking and tasting demonstration was also conducted.

Following the launch, our community outreach efforts included cooking demonstrations at various supermarkets from March to April 2010. Goody bags containing a free sample of egg powder and liquid egg and an information-cum-recipe booklet were distributed during those sessions to encourage consumers to try the recipes at home.



## Food Safety



# DEPENDABLE

Whether it's eating to live or living to eat, Singaporeans are assured of wholesome goodness in every bite. You can depend on AVA to keep a holistic watch on the safety of Singapore's food from production to just before retail.



## Food Safety

### Maintaining The Safety Of Food

**AVA is responsible for ensuring the safety of imported food as well as locally produced food in Singapore. When it comes to managing food safety, AVA maintains a holistic and integrated perspective to ensure that our food supply remains resilient and safe for consumption. We are involved in the food chain at every stage, from the inspection of food supply sources to the surveillance and testing of food products upon arrival.**

**With the majority of Singapore's food supply coming from sources all over the world, AVA has adopted a science-based risk assessment and management approach that is based on international standards, to ensure the safety of our imported food. Our integrated system of source accreditation, inspection, and post-arrival verification testing, supported by enforcement of food safety standards through a well-established legal framework as well as public education on shared responsibility in food safety, keeps food safe for consumption.**

## Regulating Food Imports

### Inspection and Accreditation of Overseas Sources

#### Meat and Egg Processing Establishments

During the year, 102 applications were received from foreign establishments in 18 countries for accreditation to export meat, processed meat and processed egg products to Singapore. This included applications from existing AVA-listed establishments requesting to export additional types of processed meat products to Singapore.

We approved Mexico and Poland for the export of frozen and processed pork, and India for the export of processed egg products to Singapore. Another 37 new meat and egg processing establishments from nine approved countries were accredited for export to Singapore. Two establishments in Taiwan and one establishment in China were approved to export salted eggs and preserved eggs to Singapore.

Inspection visits were also conducted to 19 establishments in China, Malaysia and Thailand to assess and accredit their establishments for the export of meat, processed meat and processed egg products to Singapore.

At the end of FY2009, a total of 766 foreign meat and egg-processing establishments from 33 approved countries were accredited to export meat, processed meat and processed egg products to Singapore.

#### Poultry and Pig Farms

In FY2009, we accredited 236 overseas poultry farms and one pig farm to export live poultry, shell eggs, and pigs to Singapore. The accredited poultry farms comprised of 132 chicken broiler farms and 57 duck broiler farms in Malaysia and 47 layer farms for the export of eggs from six other countries.

#### Suspension of Supply Sources

AVA uses a risk-based approach to mitigate risk from imported foods to protect both public and animal health. We suspend sources that pose significant hazards, and reinstate those that are able to rectify the hazards. We collaborate with our counterparts to carry out rectifications for export reinstatement.

In FY2009, we suspended 19 overseas poultry farms for failure to comply with our food safety standards, and subsequently reinstated eight of these suspended farms after the lapses were rectified. The non-compliance with import conditions was due mainly to the detection of Salmonella Enteritidis (SE) and drug residues.

To protect Singapore's Foot and Mouth Disease (FMD) and Notifiable Avian Influenza (NAI) free status, we suspended the import of risky products from countries with FMD or NAI outbreaks. At the same time, we also lifted suspensions following assessments that affected countries have regained their disease-free status.





## Import Control and Inspection

### Meat and Fish Products

There were 2,560 registered importers for meat and fish products, and 206,310 import permits were issued in FY2009. During the year, we inspected 68,411 consignments of meat and fish, and 68 consignments were rejected for not meeting our food safety standards. During the same period, we investigated 16 cases of illegal import of meat and fish products. Of these 12 cases were issued composition fines while four cases were prosecuted. The illegal import consignments were destroyed.

### Fruits and Vegetables

There were 1,005 registered importers for fresh fruits and vegetables and 207,158 import permits were issued in FY2009. During the year, 12,365 consignments of fresh fruit and vegetables from 26 countries were inspected and screened for pesticide residues and chemical and microbial contaminants, of which 367 consignments were rejected. The overall pesticide violation rate remained relatively unchanged at 6% and active collaboration was sought from our counterparts in other countries to provide effective remedial action on pesticide residue violations.

Longans continued to be subjected to a stringent 100% check for the presence of sulphur dioxide. Of the 171 longan consignments inspected, eight were rejected. In

addition, 316,700 receptacles checked for compliance with AVA labelling requirements were found to be satisfactory.

### Processed Food

In FY2009, Singapore imported approximately 3.2 million tonnes of processed food, valued at more than \$7,300 million and represented by more than 43,100 brands from 146 countries. These products range from beverages, bakery, cereal and dairy products, to infant foods, fats, oils, spices, condiments, and sauces. We require high-risk processed foods to undergo pre-market assessments before importation, while low-risk processed foods are monitored under a post-market surveillance programme.

During the year, 13,692 inspections were conducted on 255,000 consignments of imported processed food, and 9,258 samples were collected for laboratory analysis and other checks. Of these, 112 consignments were rejected due to the presence of non-permitted food additives, excessive additives and contaminants.

In addition, 5,662 inspections were conducted at retail outlets on 81,666 food items, and 7,280 food samples were taken for chemical, microbiological and physical analyses.

Of the 13,068 processed food and foodware importers registered with AVA as at 31 December 2009, only 7,192 were active importers. In FY2009, we processed more than 264,000 import permit applications and attended to 51,157 consultations with food traders and consumers on matters relating to the import of processed food.

A total of 183 summonses/compound fines, 303 written warnings and 26 verbal warnings were issued for non-compliances with our food regulations during the FY. We investigated 193 complaints against food operators and took appropriate enforcement actions in cases where hygiene contraventions or other offences were detected.

## Food Safety



## Regulating Local Food Production

### Farms

To ensure food, environmental and worker's safety, AVA registers and approves all agricultural pesticides used in vegetable and mushroom farms, and certifies pesticide operators to supervise the application of pesticides in the farms. At the end of FY2009, there were 310 pesticide products approved for agricultural use, while the number of certified pesticide operators stood at 131.

Local vegetable farms are encouraged to adopt the Code of Good Agricultural Practice, under the voluntary Good Agricultural Practice for Vegetable Farming (GAP-VF) Certification Scheme. As at 31 March 2010, six vegetable farms were GAP-VF certified.

### Slaughterhouses

During the year, AVA licensed 10 chicken slaughterhouses, four duck slaughterhouses and a pig slaughterhouse.

We also issued 88 licences to temples and mosques to slaughter 1,395 goats and 5,659 sheep for religious and ceremonial purposes, and granted approval to the Jewish Welfare Board of Singapore to slaughter fewer than 200 chickens per week for the Jewish community.

During the licensing and grading exercise, five poultry slaughterhouses were awarded "A" grade, and all 14 chicken and duck slaughterhouses received the Hazard Analysis and Critical Control Point (HACCP) accreditation.

A total of 43.2 million chickens, 5.8 million ducks and 281,954 pigs were slaughtered at the slaughterhouses. All slaughtered pigs at the abattoir were inspected by AVA, of which 1,352 pigs and 134,295 partial organs were condemned for being unfit for human consumption. AVA also carried out 395 inspections on poultry slaughterhouses, deboning plants, crocodile and frog processing plants, and collected 16,402 samples from the abattoir, 3,314 samples from poultry slaughterhouses and 138 samples from deboning plants, crocodile and frog processing plants for laboratories analyses.

Enforcement actions were taken against poultry slaughterhouse operators that consistently failed to comply with regulations. Composition fines amounting to \$10,000 were collected for hygiene infringements and cold chain violations.

### Food Processing Establishments

During the year, AVA licensed and graded 1,300 local food processing establishments to ensure that local food producers observe good manufacturing practices and meet global standards. As at 31 March 2010, there were 136 food establishments graded "A", 546 graded "B", 422 graded "C" and 44 graded "D". The remaining 152 new food establishments were not due for grading exercise. We also advised food establishments on proper sanitary design, layout and process flow.

AVA regularly inspects local food establishments to ensure that proper hygiene practices are observed. In FY2009, AVA made 6,730 inspection visits to processed food factories, and collected 2,399 processed food samples for laboratory analyses. Of these, 11 (0.46%) were found to be unsatisfactory. We issued 64 summonses/compound fines, 158 written warnings and 825 verbal warnings for non-compliance with the Sale of Food Act. We also attended to 25 complaint cases on unwholesome and improperly labeled pre-packed processed food, and took appropriate enforcement actions for contraventions in hygiene practices and other offences.

Another 1,935 inspections were carried out on meat, fish, egg processing plants and cold stores, with 223 fish-based product samples and 150 meat product samples collected for laboratory analyses. All samples were found to be satisfactory. There were 32 summonses/compound fines issued due to non-compliances with the Wholesome Meat and Fish Act, and 53 complaint cases were investigated with appropriate enforcement actions taken where hygiene contraventions or other offences were detected.

## Food Safety Surveillance and Monitoring

AVA's risk-based surveillance and monitoring programmes are targeted at high risk products and significant food safety hazards.

### Meat and Seafood Products

During the year, we continued to keep a close watch on ready-to-eat processed meat and seafood products for *Listeria Monocytogenes* contamination, and on beef products for *E Coli* 0157:H7 contamination. Both bacteria are capable of causing severe illness in children and people with weakened immune systems. We also monitored fresh seafood imports for the presence of formaldehyde and boric acid which are common preservatives used in seafood. Of the 6207 samples tested, 11 samples tested positive for *Listeria monocytogenes*, three were positive for *E Coli* 0157:H7 and 15 were positive for formaldehyde.

### Processed Food

During the year, processed food and food-contact articles such as flour, bakery products, cereal products, confectionery, fats and oils, milk and milk products, sauces, beverages, alcoholic drinks, spices and condiments were routinely tested and monitored for chemical and microbial contaminants.

Additional surveillance were also initiated in response to feedback and findings in reports. Arising from the presence of *Salmonella* in peanut butter and pistachio products from the USA, AVA tested 212 samples of peanut butter and peanut products and 69 samples of pistachio products imported from all sources, including the USA. All products were found to be free from *Salmonella* contamination except for one product, roasted pistachio, which was recalled and destroyed. The detection of Auramine O, an industrial dye that is not permitted to be used in food, in 26 types of tea leaves products imported from Myanmar also led to the recall and destruction of all implicated products.

AVA also initiated testing of prepacked processed seaweed for the presence of plastic polymers and non-permitted colours; preserved fruits and plums for the presence of heavy metals and mycotoxins; coffee powder and instant coffee for the presence of mycotoxins and erectogenic agents; and energy drinks for elevated levels of caffeine and the presence of common poisons, including cocaine. All samples tested were found to be satisfactory.

In addition, AVA also monitored biscuits for melamine, flour & flour products, soy based products for genetically modified organisms, as well as bottled mineral water for uranium. All samples tested were found to be satisfactory.

### Laboratory Testing

Laboratory testing is a critical component in AVA's food safety monitoring and surveillance programmes. The state-of-the-art laboratories at AVA's Veterinary Public Health Laboratory (VPHL) are capable of detecting a wide range of foodborne hazards, particularly those of current and emerging importance.



## Food Safety

In FY2009, the VPHL conducted 2,108,015 analyses on 65,027 samples of imported and locally-produced food products, to detect pathogens, antibiotics, growth promotants, hormones, pesticide residues, chemical additives and contaminants which are harmful to public health.

The VPHL also provides analytical services to the local food industry, as well as government departments and statutory boards. During the year, we provided testing support during several food safety alerts, and participated in joint agency investigations with NEA and MOH into food poisoning incidences. Commercial testing services were also rendered to Brunei, Indonesia and Malaysia.

### Strengthening Food Safety Testing Capabilities

As an import/export testing and certification laboratory, VPHL ensures that its tests are accredited according to international standards. The laboratory is ISO/IEC 17025 certified and has been accredited by the Singapore Accreditation Council-Singapore Laboratory Accreditation Scheme (SAC-SINGLAS) since 2000. With 12 new methods



accredited in the FY, the number of accredited methods was raised to 192. The VPHL continued to excel in relevant inter-laboratory Proficiency Testing Schemes organised in various countries, including Australia, Canada, Sweden, United Kingdom (UK), and the United States (US).

Faced with an ever-increasing list of food contaminants and newly-emerging food pathogens, AVA continued

to keep abreast of cutting-edge technology. During the FY, we invested \$3,170,890 to upgrade and replace our laboratory equipment, and continued to develop new methods and capabilities to detect a wider range of drug residues, pesticide residues, mycotoxins, biotoxins, genetically modified materials, food preservatives and food pathogens.

AVA would be embarking on a five-year project to establish laboratory capability to scan for early signals and the possible presence of uncommon and unanticipated contaminants. Such a capability will enable us to carry out more comprehensive product scans of targeted food from higher risk sources. The project would tap on recent technologies such as Time of Flight Mass Spectrometry systems (TOF-MS), which have already been adopted by some regulatory laboratories in the European Union and USA to complement their food safety monitoring.

### Laboratory Training

AVA provided technical training in the analyses of heavy metals, pesticide residues, mycotoxins and microbes to six officers from the Philippines in May 2009, and to five participants from Indonesia in September 2009. Another 25 students from local tertiary institutes and the polytechnics were also attached to VPHL during the year, as part of their industrial training programme.

## Staying Alert Against Emerging Threats and Issues

### New Food Safety Measures

The safety and suitability of 10 new food ingredients and seven new food additives for use in general and special purpose foods were assessed. The scope and/or maximum levels of eight existing food additives were increased, based on available safety information.

Proposed function claims were also considered for nutrients and ingredients such as collagen and L-carnitine. Five new nutrient specific diet-related health claims as well as one new health claim for food products containing plant sterols/plant sterol esters were permitted.

### **Codex Alimentarius Commission**

AVA participated actively in various Codex meetings held throughout the FY. Issues discussed ranged from food safety, food import and export certification systems, food additives and contaminants, pesticide residues, antimicrobial resistance, to nutrition labelling and the use of health claims. As Singapore's Codex Contact Point, AVA acted as a local channel for the exchange of information. We also ensured that Codex food safety standards adequately protect our local population and are of fair practice to our local food traders.

### **Advisory Committee on the Evaluation of Health Claims**

In August 2009, AVA formed an Advisory Committee on the Evaluation of Health Claims comprising reputable experts from government bodies, tertiary institutions, and industry. By the end of the FY, the Committee has established a framework and principles for the evaluation of health claims in Singapore and developed a set of information, application form and checklist to guide industry members to apply for the use of nutrient and other function claims. It also evaluated and approved its first health claim.

## **Engaging the Industry and Other Agencies**

### **Dialogue sessions**

In FY2009, AVA initiated dialogue sessions with the industry associations to gather feedback and explore opportunities for AVA and industry to work together in areas of mutual interest. These included the Singapore Food Manufacturers Association, the Singapore Manufacturers Federation, Meat Traders Association, Seafood Industries Association Singapore, Poultry Merchants Association, Eggs Import/Export Trading Association, Singapore Fruit and Vegetable Importers and Exporters Association, Singapore Aquarium Fish Exporters' Association, Singapore Livestock Farmers Association, Singapore Fish Merchants General Association, Punggol Fish Merchants General Association, Pets Enterprises and Traders Association of Singapore,



and various animal welfare groups. We also met up with the US-ASEAN Business Council to discuss possible areas of cooperation between AVA and USABC member companies. At the same time, AVA also met up with other government agencies such as the Health Sciences Authority, National Environment Agency, and Singapore Land Authority to strengthen collaboration on areas of mutual interest.

Dialogue sessions were also conducted to update the industry on AVA's new requirements. These included new Food Regulations that would be implemented in FY2010, proposed trans-fat requirements for fats and oils, and import requirements for minimally processed coconuts and products. Together with Spring Singapore, AVA educated manufacturers, retailers and importers on the Average Quantity System for weight declaration of prepacked foods.

### **Workshops and Training Courses**

AVA conducts regular workshops and training courses to educate the industry on food safety and hygiene procedures. The 44<sup>th</sup> to 47<sup>th</sup> runs of the workshop for "Enhancing the Profile & Role of Factory Hygiene Officers" for factory licensees and hygiene officers were successfully held from July 2009 to March 2010. In-factory talks on "Food and Personal Hygiene" were also held during the same period for food handlers.

## Food Safety



### Collaboration with Government Agencies

AVA conducted four sharing sessions on the regulatory control of animals, birds, meat & seafood products, as well as endangered species of animals and plants for the Police Coast Guards to equip them with the necessary information to handle cases related to AVA.

## Shared Responsibility in Food Safety

### Food Safety Public Education

AVA recognises that the integrated food system we have in place would not be as effective without the collaboration of the industry and consumers in Singapore given that food safety is a shared responsibility.

### Food Safety Awards Night

AVA's annual Food Safety Awards Night was held on 31 July 2009 to recognise industry players that have attained high standard of food safety. Guest of Honour, Minister for National Development, Mr Mah Bow Tan, presented 7 Silver Awards, 14 Bronze Awards and 64 Certificates of Commendation to recipients during the night. During the FY, Wyeth Nutritionals (Singapore) Pte Ltd joined nine other companies as AVA's Food Safety Partner. These companies are: Chop Hup Chong Food Industries Pte Ltd, Cold Storage Singapore (1983) Pte Ltd, Golden Glory Food Industries Pte Ltd, KSB Distribution Pte Ltd, NTUC FairPrice Co-operative Ltd, Seo Eng Joo Frozen Food Pte Ltd,



Singapore Food Industries Ltd, Tai Hua Food Industries Pte Ltd and Thong Siek Food Industry Pte Ltd.

In FY2009, AVA focused on the theme "Together, Let's Keep Food Safe" highlighting to consumers the 5 Keys to Food Safety, namely, Select Food Carefully, Wash and Keep Clean, Separate Raw and Cooked Food, Keep Food at Safe Temperatures and Cook Your Food Well. By observing these simple and good practices, consumers can play a part in protecting their own well-being and the well-being of their family.

Our community outreach efforts included mascot appearances, by AVA's Food Safety Mascot, Oscar, at supermarkets and libraries. A total of 38 food safety talks were also held at schools during the FY. AVA's key food safety messages were broadcasted through a series of newspaper, magazine and radio advertisements as well as point-of-sale materials at the supermarkets.

AVA also reached out to travellers on the types and quantities of food that could be brought into Singapore. Advertisements were put up at Singapore's ferry terminals as well as the Budget Terminal during the key travel period from November to December 2009.

## VPHL – New and Enhanced Test Capabilities

The VPHL sources for and embarks on relevant research and methods development in its continuous quest to enhance capability and efficiency in detecting an ever-increasing list of food contaminants and emerging food pathogens. In FY2009/2010, 53 methods were developed or enhanced, in the areas of chemical contaminants, drug residues, pesticide residues, foodborne toxins, food nutrition & chemistry, food quality & authentication, as well as microbiology & genetically modified materials analyses.

### Chemical Contaminants

- 1 Method for the determination of polybrominated biphenyls in meat using GC/MS/MS
- 2 Method for determination of bisphenols and their diglycidyl ethers in food
- 3 Method for the determination of aluminium in food using ICP/MS
- 4 Enhancement of method for analysis of PAHs in food by using rapid resolution liquid chromatograph with MS/MS (RRLC/MS/MS) to reduce analysis time
- 5 Modification of the PAH method to determine PAHs in water

### Drug Residues

- 1 Method for the detection of quinocetone in feed
- 2 Method for the detection of nitroimidazoles and their metabolites in food using LC/MS/MS
- 3 Method for the detection of coccidiostats in food using LC/MS/MS
- 4 Method for the detection of avermectins in food using LC/MS/MS
- 5 Enhancement of the method for the determination of hormones using the LC/MS/MS by the inclusion of two additional compounds , ethynyl estradiol and danazol

### Food Quality & Authentication

- 1 Method for detection of CO in CO treated meat & fish using the GCMS
- 2 Method for the determination of the authenticity of edible bird's nest using the GC method
- 3 Method for the determination of boar taint compounds determination using the LCMSMS
- 4 Method for the differentiation of meat of cat, rat, camel and horse origin using PCR
- 5 Method for the identification of shark fin species using PCR

## Food Safety

### Food Nutrition Chemistry

- 1 Method for the determination of Trans Fats in oils, fats as well as raw and processed foods
- 2 Method for the detection of fluoride in deboned meats
- 3 Method for the determination of monosodium glutamate (MSG) in cooked vegetables
- 4 Method for the determination of peroxide in rice/wheat flours and sea foods;
- 5 Improvement of method for the determination of trimethylamine (TMA) as a freshness indicator of fish and prawn
- 6 Improvement of method for the determination of polyphosphates in frozen fish and prawn
- 7 Improvement of method for the analysis of benzoic acid and sorbic acid via second column chemistry and SPE sample cleanup

### Genetically Modified Materials

- 1 Screening method for P35S using Real Time PCR
- 2 Method for the detection of 55-1 papaya
- 3 Method for the detection of Bt10 maize
- 4 Method for the detection of New Leaf Potato
- 5 Method for the detection of New Leaf Plus Potato
- 6 Method for the detection of New Leaf Y potato
- 7 Method for the detection of Bt 63 rice
- 8 Method for the detection of potato endogenous UGPase gene by PCR
- 9 Screening method for the detection of CryIIIA DNA in New Leaf Potato using PCR
- 10 Method for the qualitative detection of H7-1 Sugar Beet DNA by Real-Time PCR
- 11 Enhancement of method for the quantitative detection of Mon 863 maize by simplex real time PCR
- 12 Enhancement of method for the detection of Papaya Endogenous Papain gene by PCR

### Microbiology

- 1 Method for the detection of Norovirus in fresh fruits and vegetables using ultracentrifugation and RT-PCR
- 2 Method for the phage typing of Salmonella enteritidis and typhimurium
- 3 Method for the detection of BSE prion in bovine neural matter and beef using ELISA and western blot
- 4 Method for the detection of Ebola virus subtype Reston in raw and processed pork using PCR
- 5 Method for the detection of Vibrio cholerae, Vibrio parahaemolyticus and Vibrio vulnificus in food using a newly developed multiplex- BAX® PCR test kit (Collaborative field trial with DuPont Qualicon)
- 6 Method for the detection of Trichinella spiralis using the ELISA kit
- 7 Method for the detection of foodborne parasites (cryptosporidium, cyclospora and giardia) in fresh fruits and vegetables using centrifugation, immunoconcentration, immunofluorescence assay and PCR



### Pesticide Residues

- 1 Multi-residue method for the determination of 20 additional pesticides, using LC/MS/MS (compounds determined in one run increased to 120)
- 2 Method for the detection and confirmation of OC, ON and pyrethroids in food matrices using the GCMSMS (capable of screening and confirmation of about 150 in one run)
- 3 Method for the determination of cyanuric acids in food using SPE clean up and LCMSMS
- 4 Method for the determination of 6BA in bean sprout using LCMSMS
- 5 Method for the determination of ethephon in bean sprout using LCMSMS
- 6 QUECHERS(MRM) Method for the screening of pesticides residues in more varied food matrices

### Mycotoxins and Biotoxins

- 1 Method for the detection of aflatoxin B & G in white pepper and chilli powder using the HPLC;
- 2 Method for the detection of zearalenone in barley using the HPLC
- 3 Method for the detection of aflatoxin M1 in other processed dairy products (butter, yoghurt and cheese) using the HPLC
- 4 Enhancement of method for the detection of aflatoxin M1 using the HPLC to achieve lower detection limit of 0.05 ppb for applications to infant formulae matrices
- 5 Enhancement of the HPLC method for the determination of aflatoxin B & G to achieve better and more consistent recovery, and also with increased efficiency
- 6 Enhancement of method for determination of histamine in canned tuna using the HPLC



## Food Safety

### VPHL – Participation in Proficiency Testing

S/N	Scheme	Organizer	Analysis
1	Food Analysis Performance Assessment Scheme (FAPAS)	Food and Environmental Research Agency (FERA), UK	Chemicals contaminants and residues
2	Food Examination Performance Assessment (FEPAS) Scheme	FERA, UK	Microbial enumeration and pathogen identification
3	Genetically Modified Material Analysis Scheme (GeMMA)	FERA, UK	Genetically Modified Materials
4	The Laboratory Environmental Analysis Proficiency Scheme (LEAP) Potable Water Chemistry	FERA, UK	Chemical compounds and pollutants
5	LEAP Potable Water Parasitology	FERA, UK	Parasites
6	Health Protection Agency (HPA) Food and Water Microbiology External Quality Assessment Schemes	HPA, UK	Microbial enumeration and pathogen identification
7	Pesticide residues in fruit & vegetable proficiency study	Australia National Measurement Institute	Pesticide Residues
8	National Food Administration (NFA) Proficiency Testing Program – Food Chemistry	LIVSMEDELS VERKET, Sweden, EU	Nutritional components
9	International Measurement Evaluation Programme (IMEP)	European Union Reference Laboratory for heavy metals in feed and food (EU-RL-HM)	Heavy metals
10	USDA/GIPSA Proficiency Program	USDA Grain Inspection, Packers and Stockyards Administration	Protein & DNA analyses
11	Meat Proficiency Testing Program – Meat Analysis	Instituto Nacional de Tecnologia Industrial & Organismo Argentino de Acreditacion	Proximate Meat Analysis
12	EC-ASEAN Proficiency Testing Programme	EC-ASEAN Reference Laboratories	Microbial and Chemical Analysis

## VPHL – Performance Output, FY 09/10

Performance Indicators	Function					Total
	Health Certs	Quality Tests	Import Control	Service Surveillance	R & D and Quality Assurance	
No. of Samples Tested	3147	3628	32581	11926	13745	65027
No. of Laboratory Analyses conducted	16,071	151,593	1,681,492	226,937	31,919	2,108,015

## Ongoing Surveillance of Food Products

Primary Produce/Product	Food Safety Hazards
Meat & Meat Products	Heavy metals, preservatives & additives (sulphur dioxide, boric acid, sorbic acid, colouring matter), poly-chlorinated biphenyls, dioxins, radioactivity, beta-agonist, nitrofurans, chloramphenicol, other antibiotics, hormones and growth promotants, staphylococcal enterotoxins, E.coli O157:H7, <i>Salmonella</i> , <i>Listeria monocytogenes</i> , Vancomycin Resistant <i>Enterococci</i> , <i>Campylobacter</i> , parasites, anthrax contamination
Seafood/Seafood Products	Heavy metals, preservatives & additives (sulphur dioxide, boric acid, sorbic acid, colouring matter), formaldehyde, radioactivity, nitrofurans, chloramphenicol, malachite green and its metabolites, other antibiotics, marine toxins, <i>Salmonella</i> spp, <i>vibrio</i> spp, noroviruses, Hepatitis A and other viruses, parasites, histamine, anthrax contamination
Fruits & Vegetables	Fruit & Vegetables Pesticide residues, sulphur dioxide, <i>E.coli O157:H7</i> , <i>Salmonella</i> , <i>Listeria</i> , anthrax contamination, parasites, heavy metals, nitrates and nitrites
Processed Food	Microorganisms, pathogenic bacteria, bacterial enterotoxins, viruses, protozoa, synthetic organic colours, sudan dyes, para red, non-permitted colouring agents, chemical preservatives, sweetening agents, mycotoxins, heavy metals, migration of metals, antioxidants, non-permitted flavouring agents, 3-monochloro-propane-1,2-diol, 1,3-dichloropropanol, dioxins, polychlorinated biphenyls, acrylamide, formaldehyde, ethyl carbamate, N-nitrosamines, mineral hydrocarbons, bromate trihalomethanes, pesticide residues, drug residues, radionuclide contaminants, screening of irradiated food, poisons and adulterants, semicarbazide, benzene, histamine, food proximate, type 5 phosphodiesterase (PDE-5) analogues and inhibitors, residual chemicals in food-contact articles, migration of chemicals from food-contact articles, detection and quantification of Genetically Modified Organisms (GMOs)





## Animal Health

# DEFENDABLE

As man's best friends, animals deserve our attention and care. AVA delivers on its promise to protect their welfare and defend them against disease, so they can always be our healthy, happy companions.



## Animal Health

### Safeguarding The Health And Welfare Of Animals

Over the years, Singapore has successfully kept out major exotic and zoonotic diseases such as Foot and Mouth Disease (FMD), rabies, Nipah virus infection, highly pathogenic avian influenza (HPAI), bovine spongiform encephalopathy (BSE), anthrax and brucellosis. AVA's comprehensive and integrated animal health measures ensure that both animal and human population remains safe from such threats.

### Preventing the Introduction of Animal Diseases

Through continued vigilance and sustained efforts during the year, AVA successfully kept major exotic and zoonotic diseases at bay.

#### Import Control and Inspections

AVA tightly regulates the import and export of animals and animal products to prevent the entry of rabies, FMD, and HPAI through our checkpoints. Our integrated policies are regularly reviewed to protect our farmed, domestic and wild animals against such threats.

In FY2009, we issued 36,932 import licences for animals, birds, eggs, veterinary biologics, and animal products.

All consignments passing through the Tuas Checkpoint and Changi Animal and Plant Quarantine were subjected to strict border inspections and controls which included inspection, physical examination and documentation checks, before they were allowed entry. Consignments that could not comply with our requirements were either given a provisional release, detained or destroyed, depending on the severity of the non-compliance.

AVA also worked closely with the Immigration & Checkpoints Authority (ICA) and members of the public to act on tip-offs relating to illegal imports. During the FY, AVA investigated 98 cases of illegal imports of animals, pet food and fertilisers containing animal products, of which five cases were prosecuted, six cases were offered composition fines, and 80 cases were given warning letters. In seven other cases, we disposed of the imports. AVA also intercepted nine cases of illegal egg imports, of which one case was prosecuted.

#### Animal Quarantine

As an integral component of safeguarding animal health in Singapore, AVA imposes mandatory post-arrival quarantine for imported animals, including pet dogs and cats, horses, wildlife and laboratory animals (e.g. non-human primates and swine).

Category`	Number of permits issued
Pigs, poultry and eggs	33530
Animals (dogs, cats, small mammals, livestock, zoo animals)	2744
Biologics	162
Birds	171
Eggs (SPF eggs, specimens for laboratory tests)	35
Product (blood, sera, urine, clinical specimens)	290
Total number of licences issued	<b>36932</b>



### **Pet Animals**

In FY2009, AVA revised its rabies quarantine policy following assessments of rabies risks based on an individual country's rabies status and developments in the control of rabies. Under the revised policy, countries are categorised according to their rabies risk, and the quarantine requirements imposed would be commensurate with their risk levels.

Animals imported from Category A countries (Australia, New Zealand, UK and Republic of Ireland) and Category B countries (Italy, Norway, Sweden, Portugal, Switzerland, Japan, Hong Kong, Taiwan, Hawaii and Guam) are exempted from quarantine upon arrival in Singapore. However, the animals from Category B countries must undergo pre-export rabies vaccination, accompanied by serology test reports. Animals from Category C countries (USA except Hawaii and Guam, Canada, Belgium, Netherlands and Spain) are allowed to undergo a shorter quarantine of 10 days if they have undergone pre-export rabies vaccinations accompanied by serology test reports. Countries that have not been assessed are classified under Category D and animals from such countries will be vaccinated for rabies on arrival and placed under quarantine for a period of at least 30 days.

During the year, a total 875 dogs and 381 cats were placed in quarantine at the Sembawang Animal Quarantine Station (SAQS). Renovation works were also carried out at SAQS to increase the number of air-conditioned kennels from 44 to 54, in response to rising demand.



### **Horses**

Singapore is free from Equine Influenza (EI), a highly contagious viral disease that affects horses. To prevent the incursion of EI, AVA requires that all imported horses originate from EI-free premises.

A 14-day mandatory quarantine is imposed for all horses entering Singapore as permanent imports at the Singapore Equine Quarantine Station (SEQS), which is run by the Singapore Turf Club. AVA has regulatory oversight over the SEQS. In FY2009, 731 horses were placed under quarantine at SEQS.

During the year, AVA worked with the Singapore Youth Olympic Games Organizing Committee (SYOGOC) to facilitate the import of horses for the YOG. This included the temporary designation of a site for the quarantine for the horses which are to be imported from Australia.

### **Laboratory Animals and Wildlife**

AVA imposes a 30-day mandatory quarantine for laboratory animals such as non-human primates and swine at approved quarantine facilities. Wildlife entering Singapore would also need to undergo mandatory quarantine at AVA-approved premises.



## Animal Health

### Animal Disease Surveillance

#### Domestic Poultry and Ornamental Birds

All poultry farms are monitored for *Salmonella* Enteritidis (SE), Newcastle Disease (ND) and Avian Influenza (AI). This FY SE was detected in a flock at a local poultry farm. The infected flock was culled while eggs from this flock were sent to an AVA-approved liquid-egg processing plant. Eggs sampled from all farms tested negative for antibiotic residues.

#### Livestock Farms

Our local ruminant farms continued to be tested free from Salmonella, Campylobacter, Listeria, Yersinia, Brucella, Bovine Tuberculosis, Foot-and-Mouth Disease and Q fever.

Some ruminant farms tested positive for *E.coli* O157:H7. The affected farms were advised to treat their animals with probiotics and improve their hygiene measures to reduce the prevalence of *E.coli* O157 in their farms. Follow-up surveillance showed substantial reductions of the disease prevalence in the farms.

#### Fish Farms

##### Fish Health Surveillance

AVA continues to monitor for notifiable and emerging diseases of economic importance to the aquatic animal industry. Results from surveillance programs conducted under the Accredited Ornamental Fish Exporters Scheme (AOFES) showed that Singapore remained free from Viral haemorrhagic septicaemia virus, Infectious haematopoietic necrosis virus, Epizootic haematopoietic necrosis virus and Spring Viraemia of Carp.

Under the AOFES, Koi Herpes Virus (KHV) disease was detected in one of the member farms in early 2010. Immediate measures were taken to control the spread of disease, including the isolation of the farm to facilitate investigation, culling of the infected batch, as well as the proper disinfection and treatment of affected ponds and equipment.



Under the KHV targeted surveillance programme on imported kois, KHV was detected in imported kois during their quarantine. To eradicate the disease at quarantine level and curb the spread of the disease, AVA imposed quarantine orders to restrict the movement of all fish, and culled all diseased and in-contact fish at the importers' premises. Cleaning and disinfection measures were also implemented and the industry was advised to cease the import of kois from affected sources. The quarantine orders were lifted after AVA verified the effectiveness of control measures implemented.

A notification on the detection of White Spot Syndrome Virus (WSSV) in an export shipment of crayfish led to the detection of WSSV in crayfish at two local importers' premises. The infected crayfish were imported from the same overseas sources. AVA imposed immediate quarantine orders to restrict movements of all crustaceans at both importers' premises and culled all diseased and in-contact crustaceans. AVA subsequently identified the affected overseas sources and advised all ornamental fish importers to refrain from getting their crustaceans from the implicated sources.

AVA extended its national surveillance of aquatic animal diseases to breeders and non-export farms in early 2009, covering four main diseases of importance: Koi Herpes Virus (KHV) disease, Spring Viraemia of Carp, White Spot Syndrome Disease and Epizootic Ulcerative Syndrome (EUS). In March 2010, the national surveillance programme for EUS was further extended to include food fish farms with susceptible species.



The extended surveillance will facilitate the early detection of the aquatic diseases, allowing AVA to certify disease freedom status on a national level, and opening up accessibility to major markets such as the European Community, by end 2010.

#### *Revision of Licensing Conditions*

In July 2009, licensing conditions for the import and export of ornamental fish were revised to include biosecurity measures aimed at preventing the introduction and spread of fish diseases at the premises of licensed ornamental fish importers and exporters.

#### *Audit Inspections by Overseas Inspection Missions*

The European Commission's Food and Veterinary Office (FVO) and Biosecurity Australia carried out audit inspections in November 2009 and January 2010 respectively, to evaluate the animal health controls for the export of ornamental fish to the European Union (EU) and Australia. The inspection teams audited AVA's aquatic animal health regulatory system, inspected laboratory facilities at the Animal and Plant Health Centre and visited ornamental fish exporters.

Both audit teams found that AVA was able to effectively administer the required controls for the export of ornamental fish to the EU and Australia. To address deficiencies identified by the teams, AVA instituted pre-export inspection of ornamental fish within 72 hours of export, and would also be imposing import health certificates for import consignments to ensure that our exporters are able to meet the importing countries' requirements.

#### **Laboratory Testing for Animal Diseases**

The Animal Health Laboratories (AHL) located at AVA's Animal and Plant Health Centre (APHC) is the national reference laboratory for the diagnosis of animal diseases and testing of animal vaccines. Its state-of-the-art facilities and high laboratory testing standards enable AVA to stay at the cutting-edge for animal disease control. In FY2009, 195, 581 laboratory tests were conducted to detect and identify diseases in terrestrial animals, birds and fish.



Early detection helps to quickly arrest a disease outbreak before it impedes food production or presents a food safety concern. By acquiring new detection techniques, we are also able to keep abreast of the rigorous import health certification requirements of other countries. AHL continuously undertakes research to improve on existing disease detection techniques.

In FY2009, the AHL established several new and faster identification methods for timely diagnosis of notifiable and significant animal diseases, and identification of antibiotic resistant pathogens. To replace time consuming isolation procedures with quicker methods, we developed rapid real-time polymerase chain reaction (PCR) testing for *Escherichia coli* O157, *Coxiella burnetti*, Swine Influenza Virus, novel pandemic A/H1N1, Equine Influenza virus (matrix gene), and Yellow head virus.

AHL's high laboratory testing standards are reflected in its good performances in Inter-laboratory Proficiency (ILP) Quality Assurance Testing programmes administered by internationally recognised reference laboratories in the United Kingdom (UK) and Australia. In FY2009, AHL participated in 'Brucella abortus Rose Bengal Test', 'Salmonella in Poultry' and Equine viral arteritis (EVA) SNT Inter-laboratory Proficiency Testing Programme organised by the Veterinary Laboratories Agency (UK) with 100% accurate results for all three ILP programmes. In addition, AHL also participated in the European Union Ring Trial on Paramyxovirus and Avian Influenza Quality Control Haemagglutination and Haemagglutination Inhibition with similar successful testing results.

## Animal Health

Another testament to AHL's high standards was its continued accreditation in the field of chemical and biological testing under the Singapore Accreditation Council-Singapore Laboratory Accreditation Scheme. The AHL laboratories continued to meet all the requirements in the ISO/IEC 17025:2005 standard. In FY2009, AHL accredited nine new tests, bringing the total number of accredited tests to 92.

The new Specific Pathogen Free (SPF) chicken flock facility at APHC commenced operation in September 2009 with a batch of 30 chickens derived from the SPF flock at AVA's Sembawang Research Station (SRS). After successful trial implementation, the facility was progressively populated to maintain 20 flocks (819 chickens) in the SRS and APHC facilities. In FY2009, the facility produced 46,000 embryonated eggs, of which 14% were sold to external agencies, such as local research institutes, vaccine manufacturers and hospital diagnostic laboratories. The facility also supplied 54 chickens as sentinels at various ornamental bird breeding farms for the monitoring of HPAI and NDV.

In FY2009, 32 litres of Salmonella Pullorum stained antigen were produced to support AVA's surveillance programme to detect Salmonella Enteritidis infection in poultry farms which supply eggs and chickens to Singapore. AVA also sold 26.5 litres of the antigen to farms that were interested in checking the status of their flocks.

### Safeguarding Against Bird Flu

During the year, all local poultry farms were regularly inspected to ensure that strict biosecurity and biosegregation measures were adhered to and that all poultry houses were bird-proofed. Samples were also collected monthly for AI testing.

In our collaboration with the National Parks Board (NParks) on the surveillance of HPAI in migratory and wild birds in the Sungei Buloh Wetland Reserves, Pulau Ubin and Singapore Botanic Gardens (SBG), the 638 samples



collected from migratory and wild birds during FY2009 tested negative for HPAI.

Six swans in SBG were vaccinated against HPAI and blood samples collected from the swans after four weeks for serological tests showed protective titers in the birds.

### Safeguarding Against H1N1 Pigs in Bulan

Novel A/H1N1 (2009) was first detected in imported live pigs in August 2009, after approximately 3½ months of surveillance. The outbreak peaked in late August and early September and appeared to be resolved since mid-September 2009. As the disease had become endemic in the farm, there had been sporadic cases. The disease caused by the strain, however, was mild in pigs with minimal or no clinical disease observed on the farm and Novel A/H1N1 (2009) infected pigs had also been proven to be of little public health risk.

## Staying Alert Against Emerging Threats and Issues

AVA continued to participate in international and regional conferences and forums to keep abreast of the latest developments and lend our support and knowledge in fighting animal diseases.

## OIE

The Office International des Epizooties (OIE), known also as the World Organisation for Animal Health, is an inter-governmental organisation responsible for improving animal health. The OIE provides expertise and information on animal diseases, promotes transparency in the status of world animal diseases, and develops international standards for combating animal diseases.

AVA represented Singapore at the 77th Annual General Session of the International Committee of the OIE in Paris from 24 to 29 May 2009. Approximately 600 participants representing the 174 OIE Members, intergovernmental (FAO, WHO, World Bank, WTO, etc.), regional and international organisations took part in the event. We participated in the development of science-based international health standards that were presented for adoption, particularly for bovine spongiform encephalopathy, to ensure that high international standards were upheld for both animal and public health.

## Ensuring Animal Welfare

AVA safeguards the welfare of animals in Singapore. This is done through the licensing of pet shops and animal exhibitions, investigation of animal cruelty incidents, enforcement under the Animals and Birds Act, and public education to promote responsible pet ownership and kindness to animals.

Strong legislation and strict enforcement have prevented animal cruelty from becoming a serious problem, while stringent enforcement of the Animals and Birds (Pet Shop and Exhibition) Rules, together with the implementation of pet shop grading scheme, have resulted in improved standards of animal welfare, professionalism and customer service in the pet shops.



During the FY, AVA handled a diverse range of issues related to animals which included requests to keep exotic reptiles and amphibia as pets. Such requests were evaluated in consultation with stakeholders such as the National Parks Board, Public Utilities Board and Raffles Museum of Biodiversity and Research.

### Animal Welfare and Control

#### Regulating Pet Shops

As at the end of FY2009, there were 277 licensed pet shops, a decrease of 6.7% from the preceding year. We issued 39 licences for permanent animal exhibition and about 30 temporary animal exhibition licences.

Routine inspections were carried out at pet shops to ensure compliance with licensing conditions. The pet shops were also graded under AVA's pet shop grading scheme, which was introduced in 2007 to improve the standards of animal welfare and professionalism of pet shops, and give the public better assurance of the standards of the pet shops. Pet shops are graded "A" to "D", in accordance to their compliance with licensing conditions and the adoption of best practices. At the end of FY2009, 78 pet shops were graded "A", 153 were graded "B", 21 were graded "C" and one was graded "D". The percentage of shops graded "A" increased to 32% in FY2009, from 17% in the previous year.

## Animal Health

On 1 January 2010, AVA introduced compulsory formal training for the pet retail industry to further improve the standards of animal welfare and professionalism in pet shops and pet farms. The course was conducted by Temasek Polytechnic and supported by the Pet Enterprises and Traders Association. The first two intakes were held in March 2010 with 60 participants.

### Licensing of Dogs

It is compulsory for all dogs above three months of age to be licensed by AVA for rabies control. During FY2009, 57,938 dogs were licensed. Inspections were also carried out at various premises to ensure that dogs were licensed. Enforcement was carried out on errant dog owners who did not comply with the dog licensing rules and conditions.

### Management of Strays

During the year, AVA conducted regular operations to catch stray dogs to reduce their population to mitigate the spread of rabies should there be an incursion of the disease. Besides advising the management of industrial and commercial sites on ways to reduce the population of stray dogs and cats in their premises, AVA also advised the public on ways to reduce problems caused by stray dogs and cats in their neighbourhood. AVA also worked with NParks to advise residents who were troubled by monkeys which had strayed from forested areas into their estates.

AVA continued to loan animal traps to residents and grassroot organisations facing stray cat and dog problems, and accept stray animals surrendered to the Centre for Animal Welfare and Control (CAWC) by members of the public. During the FY, the CAWC received 8,213 feedback on animal nuisance, and took in 5,891 animals, which included 1,648 dogs.

### Enforcement Against Animal Cruelty

On the enforcement front, AVA investigated 407 animal cruelty complaints in FY2009. In most instances, there were no animal cruelty and counseling sessions were provided to improve the standard of care. In FY2009, letters of warning/advice were issued for 11 cases,

composition fines were issued for 32 cases, and a case of animal cruelty was prosecuted.

On 1 January 2009, AVA implemented new animal welfare conditions for pet farms to further improve their standards of animal welfare. We worked closely with pet farms to help them raise their standards. In FY 2009, AVA conducted 12 farm inspections, and took action against one farm for failing to comply with the new conditions.

### Public Education on Responsible Pet Ownership

In FY2009, AVA conducted events such as talks, demonstrations and road shows to promote responsible pet ownership and kindness to animals. During these events, the public was educated on minimum standards of pet care and the responsibilities that come with pet ownership. AVA continues to work with the animal welfare groups Action for Singapore Dogs, Animal Lovers League, Cat Welfare Society, House Rabbit Society (Singapore), Noah's Ark Cares and SPCA to promote animal welfare.

As part of AVA's Responsible Pet Ownership (RPO) Public Education Programme, a series of three roadshows were held at the West Coast, Leng Kee and Anchorvale Community Centres in November 2009 to reach out to heartlanders with the focal theme of the year, "Be a Considerate Pet Owner". Mr S Iswaran, MP for West Coast GRC and Dr Mohamed Maliki bin Osman, Parliamentary Secretary for National Development were the Guests of Honour for the first and last roadshows respectively. An estimated 1,500 visitors attended the roadshows which featured new highlights such as the RPO Skit, performed by AVA staff, and interactive storytelling sessions for children conducted by Singapore Polytechnic students. Students and community groups were also invited to the Roadshows. The RPO Roadshows were supported by the local animal welfare organisations, the National Parks Board and the Housing and Development Board.

Complementing our outreach activities and events was a mass media campaign that included a series of print, radio and online advertisements, bus hangers and free cards.





AVA continued to reach out to schools through school tasks and the RPO Teacher Ambassador and Pet Pal Badge Programmes. During the FY, more than 1,200 students earned the Pet Pal Badge by carrying out RPO related activities and a total of 19,300 participants were reached through AVA's RPO school talks and workshops. AVA also launched a new interactive microsite, Pet Central (<http://petsforlife.com.sg>) in March 2009. The microsite provides information on pets and incorporates interactive features such as games, pet hall of fame and electronic cards.

### **Regulating the Veterinary Profession**

AVA is the licensing authority for veterinary surgeons and regulates the veterinary profession in Singapore. AVA licenses and inspects veterinary centres to ensure compliance with animal health and welfare standards. As at 31 March 2010, 185 veterinarians and 39 veterinary centres were licensed by AVA.

With the introduction of compulsory professional education (CPE) requirements for the veterinary profession in 2008, all licensed veterinarians are required to meet the required CPE points to maintain their veterinary licences. From 1 January 2010, the renewal of veterinary licences was facilitated through the effective management of a system between AVA and the Singapore Veterinary Association.

### **Regulating Research Institutions**

AVA licenses animal research facilities based on guidelines formulated by the National Advisory Committee for Laboratory Animal Research for the care and use of animals in research. As at 30 April 2010, 25 animal research facilities with 55 premises were licensed. These facilities were inspected annually to ensure compliance with licensing conditions.

## Animal Health

### Animal and Plant Health Laboratories – New Test Capabilities

S/N	Tests
1	<i>Mycoplasma synoviae</i> rapid serum agglutination test
2	<i>Bordetella bronchiseptica</i> culture and identification
3	Real-time PCR detection of Koi Herpesvirus
4	Detection of <i>Chlamydophila psittaci</i> by nested-PCR
5	Detection of Influenza A Virus Antigen By ESPLINETM Influenza A & B-N Test Kit
6	Detection of Equine Influenza Virus (Matrix Gene) by the Real-time reverse vii. transcription polymerase chain reaction assay (RRT-PCR)
7	Detection of Koi Herpesvirus DNA By PCR
8	Detection of <i>Theileria equi</i> antibodies via Immunofluorescent Antibody Test (IFAT)
9	Detection of <i>Babesia caballi</i> antibodies via Enzyme linked Immunosorbent Assay (ELISA)
10	Culture of mycobacteria by automated microbial detection system
11	Real-time polymerase chain reaction (PCR) for identification of <i>Escherichia coli</i> O157
12	PCR for detection of the staphylococcal virulence marker Pantone-Valentine leukocidin genes
13	DNA-STRIP technology for identification of Methicillin-Resistant <i>Staphylococcus aureus</i> (MRSA)
14	Polymerase chain reaction for detection of <i>Aphanomyces invadans</i>
15	Pulsed-field gel electrophoresis typing of <i>Escherichia coli</i> O157:H7
16	Pulsed-field gel electrophoresis typing of <i>Salmonella</i>
17	ELISA test for the detection of antibodies against <i>Coxiella burnetii</i> , in serum, plasma and milk samples of ruminants, using the IDEXX CHEKIT Q-Fever Antibody ELISA Test Kit
18	Real-time PCR assay for the detection of <i>Coxiella burnetii</i> using the ADIAVET® COX Realtime Kit
19	Detection of Ebola-Reston virus by rt-PCR
20	Detection of Lyssavirus by rt-PCR
21	Detection of Classical rabies virus by RRT-PCR
22	Detection of AIV type A antibodies by microparticle immunoassay
23	Detection of avian influenza subtype H3 virus by rt-PCR
24	Detection of avian influenza subtype N2 virus by rt-PCR
25	Detection of swine influenza virus (matrix gene) by RRT-PCR
26	Detection of novel H1N1 virus by RRT-PCR
27	Detection of swine influenza subtype H3 virus by rt-PCR
28	Detection of swine influenza subtype H1 virus by rt-PCR
29	Detection of swine influenza subtype N1 virus by rt-PCR
30	Virus isolation of swine influenza virus in chicken embryonated eggs
31	Detection of swine influenza virus subtype H1N1 antibodies by ELISA
32	Virus isolation of swine influenza virus in MDCK cells
33	Detection of avian metapneumovirus (AMPV) antibodies by ELISA
34	Detection of swine influenza virus subtype H1 by HI test
35	Genotyping of Koi herpesvirus by duplex PCR
36	Analysis of Koi herpesvirus by DNA sequencing
37	Detection of White spot syndrome virus by PCR
38	Detection of Yellow head virus by rt-PCR
39	Detection of Infectious hypodermal and haematopoietic necrosis virus by PCR
40	Detection of Bovine Spongiform Encephalopathy in formalin fixed tissues via Immunohistochemistry (IHC)
41	Detection of <i>Trypanosoma evansi</i> antibodies in canine serum via Card Agglutination test
42	Detection of <i>Ehrlichia canis</i> antigen in tissue via PCR



## Animal Control FY09/10

	No.
<b>Licensing of Dogs</b>	
New dog licenses issued	12156
Dog licenses renewed	45683
<b>Total</b>	<b>57839</b>
<b>Control of Stray Animals and Birds</b>	
Stray dogs impounded	1648
Stray cats impounded	2556
Others	1693
<b>Total</b>	<b>5897</b>
<b>Feedback on Animal and Bird Nuisance</b>	
Dogs	3589
Cats	3285
Pigeons	250
Monkeys	740
Others	349
<b>Total</b>	<b>8213</b>



## Plant Health

# SUSTAINABLE

Be it a walk in the park or a potter around the garden, being around greenery does wonders for our sense of well-being. AVA helps sustain a lush natural environment by keeping pests and plant diseases at bay.





## Plant Health

### Safeguarding The Health Of Our Plants

AVA is committed to protecting our local flora from the negative impact of exotic and emerging indigenous plant pests and diseases. Through a robust science-based regulatory system, we aim to protect the sustainability and diversity of our landscape.

Our comprehensive plant health programme, comprising import regulation and inspection as well as laboratory testing and surveillance, successfully kept Singapore free from important quarantine pests and diseases. These include the stored product pest Khapra Beetle, Mediterranean and Queensland fruit flies and the fungal disease of rubber, the South American Leaf Blight.

### Preventing the Entry of Plant Pests and Diseases

AVA kept a watchful eye on plant imports for the presence of quarantine pests and exotic plant diseases through surveillance and inspection programmes at our borders. We partnered relevant local and international agencies to expand the scope of our surveillance and established diagnostic networks to tap on expertise for rapid responses to keep our plants healthy.

#### Import Control

With nearly 47% of Singapore covered in greenery, we are vulnerable to the invasion of alien species. Exotic plants imported to beautify our landscape have the potential to be hosts for invasive plants pests or become invasive alien species themselves. AVA adopts a pest risk assessment approach and risk mitigation measures to control the import of high-risk materials. A customised Singapore Pest Risk Analysis Checklist for plants and plant products was developed for use after an intensive review of the protocols adopted by Australia, the European Union and the United States.

The import of plants and plant products are regulated through plant health import requirements stipulated by AVA. In 2009, 28,995 import permits were issued. Consignments were also subjected to post entry



inspections and samples were collected for laboratory tests.

Nurseries in Malaysia are accredited by AVA to minimise the risk of introducing plant pests and diseases through imports. AVA began discussions with China to have a similar arrangement. The quality of products from accredited sources would be further enhanced through a system approach in quality and pest management.

The import of living organisms such as live insects that have an impact on the environment are regulated through the administration of the Biosecurity Assurance Arrangement (BSAA) Scheme. Importers are required to have facilities and management procedures to prevent the accidental escape of these insects. The facilities and procedures are audited by AVA periodically. There were 27 BSAA members at the end of the FY.

#### Border Inspections at Points of Entry

In FY2009, AVA conducted 3,979 post-entry inspections to ensure compliance with import health requirements and for the detection of pests. When quarantine pests were detected, importers were given the option of treatment or destruction of the consignment. AVA also worked closely with the Immigration and Checkpoints Authority and Singapore Post to carry out border inspection on passengers at points of entry as well as the screening of mails for regulated articles.

During the year, AVA took action against companies and persons for infringing the import requirements under the Plant Importation Rules. These actions included imposing composition fine and issuing warning letters.

### Plant Pest and Disease Surveillance

In keeping our Garden City pest and disease free, AVA implemented plant pest surveillance to detect pests and diseases before they become established in Singapore. It is also an essential component of an emergency response to a pest incursion.

### Surveillance of imported consignments

As ornamental plants introduced to beautify our urban landscape are possible pathways for potential introductions of invasive parasitic plant pests, AVA's plant health surveillance focused on high-risk areas near ports of entry, as well as the Gardens-by-the Bay at Marina Bay and nurseries with high import volume.

During the year, 3,979 post-entry inspections were conducted on imported plants and plant products to check for presence of exotic plant pests or diseases that could threaten the local flora and crops of economic importance. Pests and diseases found during inspections were of no phytosanitary concern.

AVA also conducted 521 inspections for four targeted quarantine pests, viz, the Khapra Beetle (*Trogoderma granarium*), Mediterranean Fruit Fly (*Ceratitis capitata*), Queensland Fruit Fly (*Bactrocera tryoni*) and South America Leaf Blight (*Microcyclus ulei*). During the surveillance, 1,875 samples were collected and submitted for identification. None of the organisms detected were targeted quarantine pests.

AVA also carried out surveillance on imported potatoes to check for Potato Wart Disease (PWD) and Potato Cyst Nematode (PCN). Although PWD and PCN are not known to be present in Singapore and potato is not a crop grown locally, Singapore's large importation of potatoes from different countries elevates the risk of incursion. We



conducted 133 inspections and collected 78 samples for PCN testing and 80 samples for PWD testing. All samples tested negative for PCN and PWD.

### Surveillance of local farms and flora

AVA kept a close tab on local vegetable farms, orchids and ornamental nurseries through regular visits and pest monitoring systems to ensure that there is no outbreak of plant pests that can disrupt local production. 1,896 plant surveillance visits were made and more than 8,480 samples of plants, pest traps and soils were examined for plant pest infestation and nutrient status.

In FY2009, our surveillance efforts detected the presence of a regulated quarantine fungal pest of oil palm on a new alternate host, the Common Fishtail Palm, at Woodlands Town Garden Park. Eradication measures were implemented and some 3,050 palms trees around Singapore were surveyed to determine the extent of the spread of the pest. Although 68 positive detections were found, the pathogen was not detected in other palm species.

Another regulated quarantine fungal pest - *Cochliobolus carbonum* of maize was detected on some maize seedlings in a local nursery. In depth surveillance did not reveal any further spread after the affected plants were destroyed. This incursion was deemed as an isolated event and of minimum economic impact as the pest is limited to maize.

## Plant Health

While our monitoring surveillance did not reveal any major outbreaks of endemic plant pests in local farms, there was sporadic occurrence of Fusarium yellows and Colletotrichum capsici in local vegetables, seasonal fluctuation in population of Thrips palmi. However, these occurrences were well managed through our extension services.

AVA continued to record new plant pests and new plant hosts for pests during plant surveillance. We will monitor such pests and take appropriate control measures should significant quarantine pests be detected.

### Extension Services

AVA conducted plant health assessment visits in response to requests from commercial and residential establishments. During the year, we received 26 such requests, the majority of which were from condominiums seeking support for maintenance contracts of their landscape gardens.

In assisting golf superintendents to seek approval from the Public Utilities Board to use pesticides and fertilisers in golf courses near catchment areas, AVA evaluated the pesticides and fertilisers for plant health management.

### New plant pests / hosts recorded in FY2009

Hosts	Pests/Pathogens
<i>Tabebuia rosea</i>	Fungi : <i>Omphalina species</i>
<i>Philodendron species</i>	Nematodes : <i>Rotylenchulus reniformis</i>
<i>Vitis vinifera</i>	Fungi : <i>Phakopsora euvitis</i>
<i>Caryota mitis</i>	Fungi: <i>Sphaerodothis arengae</i>
<i>Saccharum officinarum</i>	Fungi : <i>Bipolaris sacchari</i>
<i>Asplenium species</i>	Fungi : <i>Cercospora asplenii</i>
<i>Elaeis guineensis</i>	Fungi : <i>Exosporium species</i>
<i>Syzygium species</i>	Fungi : <i>Microthyrium species</i>
<i>Caryota mitis</i>	Fungi : <i>Oplothecium arecae</i>
<i>Saccharum officinales</i>	Fungi : <i>Passalora vaginae</i>
<i>Licuala spinosa</i>	Fungi : <i>Phaeochora steinheilii</i>
<i>Callistemon citrinus</i>	Fungi : <i>Phyllachora callistemonis</i>
<i>Costus woodsonii</i>	Fungi : <i>Pseudocercospora costi</i>
<i>Solanum species</i>	Fungi : <i>Pseudocercospora trichophila</i>
<i>Angiopteris species</i>	Fungi : <i>Seimatosporium sp</i>
<i>Brachychiton rupestris</i>	Bacteria : <i>Klebsiella oxytoca</i>
<i>Ixora species</i>	Virus : Tomato Spotted Wilt Virus
<i>Carica papaya</i>	Insect : <i>Paracoccus marginatus</i>
Cactaceae	Nematodes : <i>Meloidogyne enterolobii</i>





During the FY, AVA also completed the efficacy evaluation of 10 insecticides against flea beetles infesting local vegetables, seven insecticides using three different application methods for control of leafminers infesting Angsana trees, and six fungicides against eight major plant pathogens in Singapore. The efficacy results revealed significant improvement in the control of these pests.

During the FY, 283 samples from export consignments were tested free for specific pests and diseases that could affect trade in agricultural commodities and supplies. AVA withheld the issuance of phytosanitary certificates for non-compliant exports.

### **Laboratory Testing for Plant Health**

In FY2009, AVA's Plant Health Laboratory (PHL) performed 29,907 tests to diagnose plant pests and nutritional problems for the industry and commercial customers.

We received 22 samples for plant pests and soil analyses from China, Hong Kong, Indonesia, Macau, Malaysia and Vietnam. In November 2009, the Plant Containment Facilities at PHL, which were equipped with safeguards for the processing of samples for exotic plant pests, began operation.

To improve our services to customers, AVA launched its Electronic Laboratory and Inspection Service on 7 September 2009 to enable online application for plant health testing services and facilitate the release of results to customers. A service booklet detailing AVA's range of plant health diagnostic services was also made available to the public on our webpage.

PHL undertakes research continuously to improve on existing detection techniques. To differentiate between morphologically indistinguishable species and replace

## Plant Health



time consuming morphological identification, AVA developed the polymerase chain reaction detection of *Fusarium oxysporum* and *F. commune* which causes yellowing in vegetables. To facilitate diagnosis, AVA adopted the pocket diagnostic immunological detection strips for *Ralstonia solanacearum*, which causes bacterial wilt in ornamentals and introduced the testing of boron in leaf tissue to support testing requests. In collaboration with NParks, PHL successfully adopted the use of wooden baits to capture the presence of *Phelinus noxius*, a root borne pathogen that attacks the roots of a number of trees in Singapore. In conjunction with selective isolation, these baits enable effective diagnosis and immediate resolution of roadside tree problems.

PHL's high laboratory testing standards were reflected in its continued accreditation in the field of chemical and biological testing under the Singapore Accreditation Council – Singapore Laboratory Accreditation Scheme (SAC-SINGLAS). The laboratories continued to meet all requirements in the ISO/IEC 17025:2005 standard and good performance in four inter-laboratory proficiency quality assurance testing programme administered by internationally recognised reference laboratories in the Netherlands.

### Plant Pests Records and Database

In order to meet international obligations and be able to conduct pest-risk analyses and establish phytosanitary regulations to safeguard plant health, Singapore needs to maintain reliable pest records. In the context of international trade, records based on voucher specimens that are held in properly curated collections provide the most reliable evidence of a country's plant health status.

As the national authority in plant health, PHL embarked on the development of a searchable Electronic Herbarium Database for its plant pathogens herbarium comprising over 600 specimens to meet international standards. Additionally, PHL also completed the Phase II (2001 – 2008) compilation of the Plant Host Pest Disease Index which now comprised of host-plant pest records of

Singapore dating from 1960s to 2008. The Index would be made available in electronic form in 2010.

## Staying Alert against Emerging Threats And Issues

To monitor the impact of the granite stockpile at Lim Chu Kang on the surrounding 23 agro technology farms, AVA coordinated a surveillance programme that focused on parameters affecting vegetable, orchid and ornamental plant growth, namely soil pH, soil texture and phosphorus content. Results of the quarterly monitoring of soil parameters revealed variations, but these variations were within the expected dynamics of soil systems.

AVA maintained its readiness to deal with incursions by testing and updating our contingency plans. We continued to participate in international and regional conferences to keep abreast of the latest developments and lend our support and knowledge in fighting against invasive plant pests.

## Engaging the Industry

To boost local production, AVA conducted a three-year surveillance of vegetable farms to develop an advisory reference for two commonly grown leafy vegetables, Xiao Bai Cai and Bayam. A reference document on "Soil and Leaf Nutrient Status of Two Leafy Vegetables grown in Singapore", listing the nutrient range for nine elements, was completed during the year.

AVA conducted three sessions of the Pesticide Operators' Safety Course for the certification of pesticide operators in our local farms. Another four training sessions on pest recognition and management in orchid cut flowers and aquatic plants were conducted for new inspectors under AVA's Assurance Certification Scheme (ACS). AVA also organised dialogue sessions for local vegetable growers to raise awareness of the impact of high phosphorus and the recommended remedial measures.



## Engaging and Educating The Public

In our continued efforts to engage the public to be "our eyes" on the ground to provide alerts on pest incursion under our Plant Health Surveillance Network, AVA successfully recruited seven new members into the network. Nine issues of Pest News were disseminated to the horticulture industry and members of the surveillance network to keep them abreast with the latest pest detections.

In August 2009, AVA participated in NParks' GardenTech to provide plant health advisory to the general public and the local landscape industry. We also conducted two library talks under NParks' Community-In-Bloom Programme. AVA also published a Mandarin version of the electronic book: "Guide to Vegetable Growing", to cater to community gardeners.





## Agrotechology



# FORESEEABLE

We envision and invest in high-tech innovations that make high-density, low-impact agriculture possible in our land-scarce island home, moderating Singapore's reliance on food imports and elevating the joys of eating fresh, eating local.





## Agrotechology

### Harnessing Technology To Optimise Limited Resources

Rapid urbanisation and a growing population have left land-scarce Singapore with very limited land for farming. Nevertheless, we are able to harness life sciences and technology to raise productivity and enhance the yield and quality of our farm produce. AVA promotes intensive large scale farming and the adoption of modern technology and farming techniques, or agrotechology, to optimise our limited resources. We aim to achieve a measure of self-sufficiency in eggs, fish and leafy vegetables, and maintain our international reputation as a leading exporter of quality orchids and ornamental fish.

and another 37 hectares of land outside the Parks were allocated to 39 farms. These included layer farms for egg production, freshwater fish farms, marine fish farms, vegetable farms, goat and cattle farms, orchid and floriculture farms, and ornamental fish farms. In addition, there were 103 floating fish farms occupying 81.5 hectares of sea space in Singapore's coastal waters.

In 2009, our local farms produced 5% of the fish, 5% of the vegetables and 22% of the eggs consumed in Singapore. AVA looks towards expanding its fish culture support to the industry to increase food fish production from our waters.

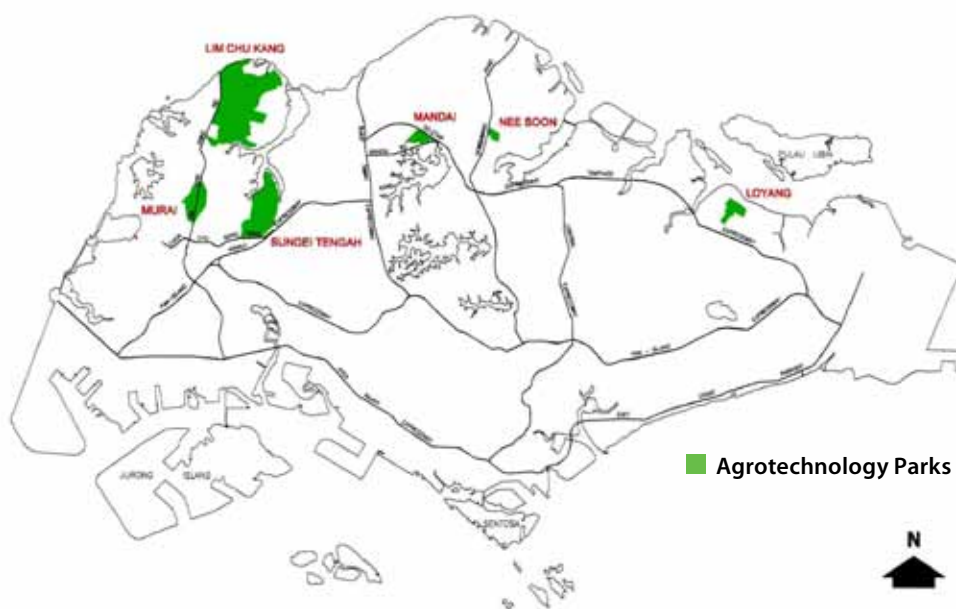
## Agrotechology Parks

AVA developed six Agrotechology Parks to promote agrotechology in Singapore. These Parks are well equipped with modern infrastructures and facilities. Comprising a total land area of about 1,465 hectares, these Parks are located at Lim Chu Kang, Murai, Sungei Tengah, Mandai, Nee Soon and Loyang.

As at March 2010, about 700 hectares of land in the Agrotechology Parks were allocated to 227 farms,

## Manpower Development

To ease the labour shortage faced by farmers in employing locals and foreign workers from traditional sources with basic farming skills and experience, AVA collaborated with the Ministry of Manpower (MOM) to launch a scheme in 2004, that allowed local farms to employ workers from non-traditional source countries such as India, Bangladesh, China, Philippines and Myanmar. To enhance the quality of the foreign workforce, AVA collaborated with MOM and the Institute of Technical





Education (ITE) to develop a skill certification programme, which includes an attachment programme at our local farms. The objective of the programme is to raise the productivity of our local farms and lift the standards of farm management in Singapore.

## Technology Development and Technology Transfer

Research and development is vital to our efforts to raise agricultural productivity to increase our levels of self-sufficiency, as well as to help our farming sector stay competitive.

To improve the variety and quality of our produce and achieve higher yields and value, our R&D projects focus on breeding, nutrition, disease control, aquaculture and vegetable production systems, and post-harvest technology.

### Aquaculture

#### Technology Development

R&D in marine aquaculture is carried out at AVA's Marine Aquaculture Centre (MAC), while freshwater aquaculture R&D is done at the Sembawang Research Station (SRS).

#### Marine Aquaculture Centre

Located on St John's Island, MAC was established to undertake tropical marine foodfish aquaculture technology development.

During the year, MAC continued to undertake R&D projects in hatchery technology development. With increase in demand for quality fish fry directed at establishing large-scale hatchery technology. To facilitate the establishment of large-scale farming locally and regionally, MAC continued to transfer hatchery and farming technologies to the private sector.

During the FY, significant advancements were made in the development of fish reproduction technology, genetic selection of Asian seabass as well as large-scale hatchery technology development.

#### Cryopreservation of Milt of Asian Seabass

The capability to store fish sperm (milt) over a period of time is a crucial technology in fish breeding. It allows fish sperm to be made available for *in vitro* fertilisation at all times, even after the male fish dies. A mass seabass milt stripping exercise was conducted to fine-tune the sperm cryopreservation technique for *in-vitro* fertilisation of Asian seabass.

## Agrotechology

### Selective Breeding of Tropical Marine Foodfish

In January 2010, AVA and Temasek Life Sciences (TLL) signed a new 5-year contract to continue with the second phase of the foodfish selective breeding project. The project aimed to establish the second filial generation (F<sub>2</sub>) of Asian seabass with 30% higher growth rate, and a second species with 15% higher growth rate. In addition, TLL would also expand and improve on the molecular tools that have been developed during first phase of collaboration and attempt to understand the mechanisms behind the sex change in seabass.

### Efficacy testing of bivalent vaccine

A field trial was initiated at a local fish farm, off Pulau Semakau, to assess the efficacy of a new bivalent vaccine, which contains two common pathogenic bacterial diseases affecting many tropical marine foodfish species. A total of 160,000 seabass fry from AVA's Pilot hatchery at MAC, was used for the trial. The efficacy results would be generated four months after the fish have been stocked in net-cages, and the performance of the two groups of fish (vaccinated and control) would be monitored till the harvesting stage.

### Marine Tilapia Broodstock Development

AVA continued to collaborate with a private company, to establish a saline-tolerant marine tilapia strain in order to move tilapia farming from freshwater to marine coastal waters. Two different strains of marine tilapia fry of the species *Oreochromis mossambicus* were obtained from South Africa in early 2009. The fry were reared at the freshwater ponds at Sembawang Research Station and subsequently acclimatised and transferred to a coastal farm at Lim Chua Kang for grow-out in the saline water conditions of Johor Straits. One of the two strains was found to have greater genetic diversity and better grow-out performance. This strain of marine tilapia would become the founding population for our selective breeding project with TLL.

### Technology Transfer

AVA shares its expertise by passing on the technology and capabilities it has developed to grow our production capacity. Besides offering technical assistance, AVA also transfers technology to farmers through seminars, talks, training programmes and various technical consultancy and advisory services.

### Large-scale Fish Nursery at Pulau Semakau

AVA worked closely with a local fish farm to successfully test and commission a newly completed large-scale fish nursery facility at Pulau Semakau. During this period, AVA demonstrated various technologies such as live-fish transportation, nursery culture and vaccination protocols. We also sent a batch of seabass fingerlings for test-bedding at the nursery facility and results showed that AVA's fingerlings were of high quality, growing from an initial stocking weight of 20g to 90g within a month of culture with near 100% survival. The fish continued to stay robust and grow well after they were subsequently vaccinated and transferred to the netcages off Pulau Semakau.

Following the success of the test-bedding trial, the farm commenced full-scale operation with a stocking of 300,000 seabass fry derived from AVA's MAC. With the technical capability gained through AVA's assistance, the farm was able to stock a larger number of smaller-sized fry to maximise the stocking capacity of its nursery. AVA also provided technical guidance on fish vaccination to the farm.

### Farm Extension and Consultancy Services

#### Farm Extension

In December 2009, fish farms in the East Johor Straits were hit by a plankton bloom which resulted in mass mortalities of fish stocks. Besides advising on mitigation measures and rendering technical assistance to farmers, AVA collected and tested water samples everyday for the duration of the bloom. Workshops on fish farm management and aeration setup were also conducted for



local farmers to strengthen their capabilities to deal with plankton blooms and pollution incidents.

During the year, AVA assisted a local farm to adopt octagonal netcages for fish culture. In addition to helping the farm to improve on the cage design, we also monitored the growth performance of fish cultured in the octagonal cages to evaluate the performance of these cages.

### Consultancy Services

To secure fish supply from the region, AVA supplied seabass fry and provided marine finfish hatchery technology consultancy services to a large-scale fish farm in near-by Indonesian waters. The services which included training on seabass hatchery technology and technical audit for the establishment of a marine finfish hatchery/nursery facility at the farm site would help the farm to produce high volumes of quality seabass fry.

### Aquaculture Services Centre

The Aquaculture Services Centre at the Sembawang Research Station continued to facilitate the development of foodfish and ornamental fish industry in Singapore by providing technical advice to stakeholders viz. investors, farmers and exporters.

In FY2009, we made 40 farm visits to coastal fish farms, 10 visits to freshwater foodfish farms and 160 visits to ornamental fish farms to attend to queries and obtain updates on production. A total of 320 visits were made to monitor the performance and activities of CITES approved Dragon Fish breeding farms and Dragon Fish retail shops. There are currently 27 CITES-approved farms in Singapore. A total of 41 farms were registered under the Dragon Fish Farm Registration Scheme. 69 approvals were given to farms for the display and sale of captive-bred Dragon Fish.

### Horticulture

Research and development on horticulture is carried out at AVA's Sembawang Research Station as well as with the commercial sector and research institutions.

### Technology Development

#### Evaluation and Cultivation of *Physalis* species (Tomatillo)

In an evaluation trial involving one local and five imported varieties of *Physalis* species (tomatillo), the growth performance and harvest yield of the imported varieties were found to be very much inferior to the local variety, *Physalis minima*.



## Agrotechology

Performance studies conducted on *Physalis minima* (tomatillo) found that the local species had a high berry yield. Given that imported tomatillo command a high retail price, AVA would be encouraging local farmers to grow local tomatillo as a supplementary crop for crop rotation, as well as to augment their income.

### Study on Club-Root Disease Resistance

AVA collaborated with the Indonesia Vegetable Research Institute in Bandung, Indonesia on a trial to evaluate the effect of a modified culture practice on the prevalence of club-root disease in xiaobaicai. The study found that adjusting the soil pH and raising the culture bed during xiaobaicai cultivation helped to keep club-root disease at bay. As club-root disease is prevalent in Indonesia, the findings would be shared with agriculture officers in various provinces of Indonesia producing leafy vegetable for export.

### Effects of Pre-harvest Conditions on Shelf-life of Vegetables

A study was conducted to determine the effects of dry and wet conditions during harvest on the shelf-life of vegetables that are packed in open, perforated and sealed plastic bags. Results showed that harvesting vegetables under wet conditions significantly reduced their shelf-life, regardless of the type of packaging that was used. For vegetables harvested under dry conditions, the results using the three types of packaging did not show significant difference.

### Technology Transfer

#### Horticulture Services Centre

The Horticulture Services Centre located at the Sembawang Research Station plays a key role in supporting the local horticulture industry. Services are provided for orchids in the areas of tissue culture, seed pod germination. Consultancy services, field evaluation and training are provided to both the orchid and vegetable industries.



The seed pod culture service continues to be popular amongst growers, hobbyists and schools as it allows the breeding and selection of unique hybrids. In FY2009, the laboratory received a total of 383 orders (comprising 41 different orchid genera) for seed pod germination, of which 270 orders were successfully germinated by the laboratory.

Scheduled visits were made to horticulture farms to provide advisory for GAP-VF (Good Agriculture Practices for Vegetable Farming) certification, consultation on agronomy practice and crop protection, to monitor farm production status and productivity, farm assessment and manpower needs, and the introduction of new varieties. In 2009, over 300 visits were made to these farms.

In support of the Community-in-Bloom programme, talks on 'Growing Leafy Vegetables', 'Growing Chillies' and 'Growing Tomatillos' were conducted in community libraries for the public to create awareness on growing common vegetable varieties in homes.

#### Cold Supply Chain from North Sumatra to Singapore

In August 2009, AVA worked with the Agriculture Department of Indonesia to conduct a study on the post-harvest processes and temperature profile of vegetables exported from North Sumatra to Singapore. Covering processes from point of harvest at farms in Brastagi to point of retail at a supermarket outlet in Singapore,





the study aimed to establish the temperature profile of temperature sensitive vegetables, so that the integrity of cold chain management on the quality of export vegetables could be assessed. The results of the study were shared with stakeholders in September 2009.

#### **Training-of-Trainers Programme with Indonesia**

AVA also continued its efforts to share and transfer vegetable cultivation, post-harvest and cold chain management technology to export farms in KEPRI, North Sumatra, East, West and Central Java under the Training-of-trainers programme with Indonesia's Agriculture Department.

Courses conducted included a 5-day course on pest and disease management and good agriculture practices for vegetable farms in May 2009; a vegetables cultivation course for East Java officials in August 2009; workshops in West Java to demonstrate protected cultivation of leafy vegetables; and a training course on cold chain management of vegetables in November 2009.

A seminar was also held in Surabaya, East Java in October 2009 for agricultural officers and farmers from East Java Province, during which AVA briefed participants on the export of vegetables to Singapore and the Singapore GAP-VF.



#### **Other Activities**

##### **Asia-Pacific Food Expo**

In November 2009, AVA participated in the Asia Pacific Food Expo to showcase a variety of fresh produce from local GAP-certified farms, our local tomatillo, as well as fresh produce from various Indonesian provinces.

##### **Pilot Trial on Cold Chain Management of Vegetables**

In March 2010, Spring Singapore, AVA and the industry jointly implemented a pilot trial to test the Technical Reference TR-24 on Cold Chain Management of Vegetables covering leafy, headed and fruited vegetables and herbs. The TR-24 was developed to meet rising consumer demand for value-for money quality produce that is fresh and safe. The objective of the trial is to develop TR-24 into a national standard for the cold chain management of vegetables for the industry.

Under the trial, seven companies from the supply chain were awarded a grant by Spring Singapore to test the land, sea and air links of the total cold chain management for the TR-24. The trial is expected to end in June 2011.





Agri-trade

# MARKETABLE

AVA forges dynamic agribusiness ties and collaborations with global partners, to bring the world's diverse harvests to our tables and to take Singapore's yields to the world.



## Agri-Trade

### Facilitating Agri-Trade & Strengthening International Relations

As Singapore's representative on agricultural, fisheries, and veterinary matters, AVA continues to facilitate free trade and maintain close ties with the global community in a spirit of exchange and cooperation.

### Jurong and Senoko Fishery Ports

Foreign fishing vessels arriving in Singapore berthed at the Jurong Fishery Port (JFP), a wholesale and distribution centre of fresh chilled fish. During FY2009, a total of 3,618 vessel calls were made at JFP. The five main fish supplying countries were Indonesia, Malaysia, Thailand, India and Bangladesh. The 94 AVA-licensed fish merchants at JFP handled 64,276 tonnes of fish landed by fishing vessels as well as imports via land and air. Of these, 4,093 tonnes were tuna imports meant for re-export.

Senoko Fishing Port is the hub for local fishing vessels. During FY2009, a total of 3,429 vessel calls were made at SFP while 22 AVA-licensed fish merchants handled 9,816 tonnes of fish from local fishing trawlers, kelongs and land-based farms as well as from imports.

### Facilitating Exports

#### Food Products

AVA facilitated trade through the provision of inspection, testing and export health certification services to the food industry for the export of meat, fish and dairy products. In FY2009, we issued 13,001 health certificates and free sale certificates, as well as 1,188 certificates for disease freedom to local food exporters to facilitate the exports of food products, which included dairy, meat and fish products, to more than 85 countries.





### Ornamental Fish

In FY2009, Singapore exported ornamental fish with an approximate value of S\$86m to over 80 countries. Major importers included EU countries, USA, Malaysia, Japan and Turkey. There was a decline in export value of approximately 9% compared to FY2008.

AVA regulates and facilitates the ornamental fish trade by issuing inward and outward declaration permits, as well as health certificates for all live fish exports. In FY2009, we issued 26,885 inward and outward permits to 115 licensed traders of ornamental fish, and 14,526 health certificates to accompany live fish consignments exported from Singapore to various parts of the world. This is a decline of approximately 14%, compared to FY2008.

### Plants and Plant Products

AVA facilitated the export of agri-products such as cut flowers, foliage, aquatic plants, food produce, timber and spices through phytosanitary inspection and certification to ascertain that these products meet the requirements of importing countries. In FY2009, we facilitated about S\$672 million worth of agri-trade through the issuance of 18,121 phytosanitary certificates. The rate of compliance with importing countries' requirements was well-maintained at 99.65%.



Companies accredited under AVA's Assurance Certification Scheme (ACS) and Accredited Pest Control Agency (APCA) scheme are required to maintain a quality management system to ensure that phytosanitary treatments undertaken meet the requirements of importing countries and comply with international standards.

During the year, we conducted 27 audits on exporters accredited under the ACS to ensure compliance with the phytosanitary certification standards required for the export of aquarium plants, cut flowers, foliage, and plants.

The APCA Scheme certifies pest control agencies with proven technical expertise and proper facilities to perform phytosanitary treatment and certification on wood packaging materials used for international trade. During the year, we accredited four heat treatment operators under this scheme and performed 49 site and compliance audits. At end FY2009, there were 16 ACS and 50 APCA scheme members.



## Agri-Trade



## Facilitating Trade in Endangered Species (CITES)

AVA's scope of work includes preventing the exploitation of endangered animals and plant species through international trade. We implement and enforce the provisions of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) to control trade in endangered species and their products.

In FY2009, we issued 1,202 CITES import permits and 6,794 CITES export and re-export permits for endangered wildlife and wildlife products. Enforcement actions were taken against 83 cases of illegal trade in wildlife, and possession of illegally imported wildlife. Of these, 25 cases were issued warnings/ advisories, 56 cases were offered composition fines, and two cases were prosecuted.

Acting on feedback that shops were found selling derivatives of tiger, such as tiger teeth, claws, nails and skins, AVA officers investigated 161 shops in March 2010 and found 30 shops selling or displaying tiger parts. We also seized 320 pieces of tiger parts and took enforcement actions against the 30 shop owners. Penalties meted ranged from written warnings to fines of \$500 to \$3,000.

## Collaboration and Dialogues with Industry

### Ornamental Fish Business Cluster

The Ornamental Fish Business Cluster (OFBC), comprising representatives from industry and government agencies, was initiated by AVA to address challenges faced by the industry and raise the international profile of Singapore's ornamental fish industry. During the year, the OFBC set new targets to enhance ornamental fish R&D and to further strengthen the export position of Singapore globally.

### Orchid Business Cluster

The Orchid Business Cluster (OBC) was established to garner the resources of Singapore's exporters and growers to formulate strategic plans to strengthen Singapore's position as a world-renowned exporter of tropical orchids and to move the industry forward in today's fast changing climate. During the year, the OBC, comprising representatives from floral associations and government agencies, held six meetings and discussed the feasibility of adopting the Work Skills Qualifications Development for training in the agritechnology sector, and plans for the Singapore Garden Festival and World Orchid Conference.

### Industry Dialogue Sessions

AVA held five dialogue sessions with the ornamental fish industry between April 2009 and February 2010 to discuss regulatory and operational issues, such as changes in import and export regulation for Asian arowanas; and to communicate the audit findings of the European Commission Food and Veterinary Office and Biosecurity



Australia, as well as actions implemented by AVA after the audit inspections.

In October 2009, AVA held a dialogue session with the Singapore Aquarium Fish Exporters' Association (SAFEA) to gain a better understanding of industry's needs and concerns, as well as identify areas of mutual benefit for collaboration. Issues raised during the dialogue included the relocation of the Jalan Kayu Ornamental Fish Export Centre; opening up the market for sale of reptiles in Singapore; and technology development and transfer for the industry.

#### **Aquarama 2009**

The 11th AQUARAMA, an international trade show for the ornamental fish industry, attracted the participation of more than 160 exhibiting companies from 23 countries.

Held in May 2009, the event was opened by Dr Mohamad Maliki Bin Osman, Parliamentary Secretary, Ministry of National Development. Besides setting up a display booth to showcase our achievements and recent developments at the event, AVA also lent support to the seminars and fish competition.

#### **Advanced Ornamental Fish Culture and Export Training Course**

The first run of the Advanced Ornamental Fish Culture & Export Training Course, held at our Aquaculture Services Centre, was successfully completed in December 2009. Organised by AVA's subsidiary company, Agrifood Technologies Pte Ltd, in close collaboration with the Ornamental Fish Business Cluster, the course was attended by 22 participants from nine companies.

## Agri-Trade



### 31<sup>st</sup> Meeting of the ASEAN Ministers Meeting on Agriculture and Forestry (AMAF) and 9th Meeting of the AMAF+3

On 10 and 11 November 2009, the Parliamentary Secretary for National Development, Dr Mohamad Maliki Bin Osman led a delegation of MND and AVA officers to attend the 31<sup>st</sup> Meeting of the ASEAN Ministers Meeting on Agriculture and Forestry (AMAF) and 9th Meeting of the AMAF+3 respectively held in Bandar Seri Begawan, Brunei Darussalam.

The 31<sup>st</sup> AMAF Meeting endorsed the following:

- a) 7 ASEAN MRLs for 5 pesticides: carbendazim (grapes and oranges), chlorpyrifos (longans and litchi), phosalone (durian), ethion (pummelo) and deltamethrin (chilli pepper)
- b) ASEAN Standards for Young Coconut, Banana, Garlic, Shallot
- c) Accreditation of the Veterinary Biologics Assay Division, Pakchong, Thailand
- d) ASEAN Criteria for Accreditation of Milk Processing Establishment
- e) ASEAN Criteria and Indicators for Legality of Timber
- f) ASEAN Guideline on Phased Approach to Forest Certification
- g) ADB Initiative to Support the ASEAN Integrated Food Security Framework
- h) ASEAN Multi-Sectoral Framework on Climate Change: Agriculture and Forestry towards Food Security
- i) Proposal to organise an ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security towards 2020 in 2011 by the Southeast Asia Fisheries Development Center (SEAFDEC)

The Ministers signed a Memorandum of Understanding on ASEAN Cooperation in Agriculture and Forest Products Promotion Scheme for 2009-2014 to strengthen exports of the products of ASEAN origin.

The AMAF agreed to transform the East Asia Emergency Rice Reserve (EAERR) pilot project into a permanent ASEAN Plus Three Emergency Rice Reserve (APTERR).

## International Relations

By participating in bilateral, regional and international meetings, AVA keeps abreast of the latest developments to safeguard Singapore's interests in food safety standards, animal and plant health, zoonotic diseases, and import requirements of specific countries.

### Bilateral Meetings

#### 14th Malaysia-Singapore Bilateral Meeting on Agriculture

The Food Safety Assurance Guidelines for Ready-to-eat Minimally Processed (MP) Fruits and Vegetables were adopted by the 14th Malaysia-Singapore Bilateral Meeting on Agriculture to facilitate future imports of MP products from Malaysia. The Guidelines will be fully implemented by October 2011.

### ASEAN and International Collaboration

In FY2009, AVA continued to participate actively in ASEAN meetings, projects and activities. Forty AVA officers attended ASEAN meetings to discuss cooperation in areas such as fisheries, livestock, crops, food safety, CITES, sanitary and phytosanitary measures and food security. Another 18 AVA officers participated in ASEAN workshops and training courses.

The AMAF+3 Meeting endorsed the preparatory stage of APTERR and directed SOM-AMAF+3 to finalise the APTERR related documents by the next AMAF+3 Meeting in 2010.

#### **ASEAN-AVRDC Regional Network for Vegetable Research and Development (AARNET) Steering Committee Meeting**

AVA attended the 4th Steering Committee Meeting of AARNET held on 12 May 2009 in Bangkok, Thailand. The meeting aimed to update members on the status of certain projects, and to discuss the corresponding follow up actions. The Meeting was attended by delegates from Brunei Darussalam, Indonesia, Malaysia, Singapore, Thailand and AVRDC-The World Vegetable Centre. AARNET also considered a Regional Symposium and Exhibition on Vegetable Value Chains in 2011 to be held in Bangkok, Thailand.

#### **Third EC-ASEAN Training on Pesticide Residue Analysis**

In July 2009, AVA hosted the "Third EC-ASEAN Training on Pesticide Residue Analysis" at its Veterinary Public Health Laboratory which has been designated as the European Commission ASEAN Reference Laboratory for pesticide residue testing. Aimed at strengthening EU and ASEAN cooperation and mutual understanding in food control, the training workshop provided opportunities for ASEAN participants to work on the methods of analysis validated by the EU Common Reference Laboratories. A total of 17 participants from nine ASEAN countries participated in the training course, which was conducted by three experts from the EU.

#### **7th Meeting of the ASEAN Expert Group on Food Safety (AEGFS)**

AVA organised the 7th Meeting of the ASEAN Expert Group on Food Safety (AEGFS) held from 13 to 15 October 2009. Aimed at discussing food safety plans for ASEAN, the Meeting was attended by delegates from Brunei Darussalam, Cambodia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore and Thailand as well as representatives from the ASEAN Secretariat from the Food and Agriculture Organisation and the Australian Marine Science and Technology Limited.

#### **Meeting of the Expert Working Group on Harmonisation of Maximum Residue Limits**

In January 2010, AVA hosted the 14th Meeting of the Expert Working Group on the Harmonisation of Maximum Residue Limits (EWG-MRLs) of Pesticides Amongst ASEAN Countries.

#### **15<sup>th</sup> Meeting of the Conference of the Parties (COP) to CITES**

In March 2010, AVA participated in the 15<sup>th</sup> Meeting of the Conference of the Parties (COP) to CITES in Doha, Qatar. The CITES COP15 discussed and debated on 70 agenda items and 42 species listing proposals. All proposals to list marine fish species such as Atlantic bluefin tuna and various shark species on CITES Appendix II were rejected.

#### **Business Awareness Seminar on Plant Variety Protection**

The Intellectual Property Office of Singapore (IPOS), the Ministry of Agriculture, Forestry and Fisheries (MAFF) of Japan, and the AVA jointly organised a business awareness seminar on plant variety protection in February 2010, under the auspices of the East Asia Plant Varieties Protection Forum. Speakers from the International Union for the Protection of New Varieties of Plants (UPOV), MAFF, and various seed associations spoke on a broad range of topics. These included strategic intellectual property protection for plants, use of biomolecular and chemical techniques for plant examination and enforcement, plant variety protection systems and their benefits.

## Distinguished Visitors

**During the year, AVA received dignitaries and overseas government officials for discussions and explorations for collaborative work. Many came to study our facilities, functions, regulatory controls and market requirements. They also toured our centres.**

### April 2009

The Ambassador of Mongolia visited AVA to discuss the accreditation procedures for the import of meat and meat products from Mongolia to Singapore.

The Ambassador of Costa Rica visited AVA to discuss AVA's regulatory procedures and requirements for the import of meat, dairy, processed food and other agricultural products from Costa Rica to Singapore.

A delegation of eight Chinese officials from Shandong, People's Republic of China (PRC) visited AVA's Veterinary Public Health Centre (VPHC) to learn about AVA's food safety framework and laboratory testing capabilities. The Chairman of the Cooperative Research Centre for National Plant Biosecurity, Australia visited Animal and Plant Health Centre (APHC) and discussed possible collaboration.

A delegation of 22 officials from the Department of Veterinary Services, Ministry of Agriculture of Malaysia visited APHC and VPHC to learn about AVA's inspection, sampling and food testing activities.

The Head of the Provincial Office of Agriculture & Food Crop from West Java Province met with AVA on plans to increase export of vegetables and fruits from West Java to Singapore.

### May 2009

A delegation of 10 officers from Cixi, PRC visited VPHC to learn about AVA's food safety framework and laboratory testing capabilities.

### June 2009

The Assistant Deputy Minister, Agriculture & Agri-Food, Canada visited AVA's Marine Aquaculture Centre (MAC) and an industrial-scale fish farm off Pulau Semakau to

understand Singapore's strategic investment in high technology farming.

The Chief Head of the Fisheries Development Authority of Malaysia visited AVA's fishing ports to exchange ideas on upgrading systems, food hygiene and other fishery matters, such as fish handling and fishing vessel.

### July 2009

A delegation of three specialists from the Federal Service for Veterinary and Phytosanitary Surveillance of Russia visited VPHC to learn about AVA's food safety framework and laboratory testing capabilities.

Three WHO fellowship candidates from Maldives visited VPHC as part of their study programme to learn about AVA's food control system.

A delegation from the Ministry of Food, Agriculture & Consumer Protection of the Federal Republic of Germany, comprising Chief Veterinary Officer and Director of Animal Health and Food Hygiene and four other officials visited VPHC to understand Singapore's food control system, particularly AVA's food import control system.

### August 2009

A delegation of 15 officials from Jilin City, PRC visited APHC and VPHC to understand more about Singapore's food control system.

The Ambassador of the Republic of Angola visited MAC to explore the possibility of collaboration.

The Director-General and his delegation from Department of Veterinary Services, Ministry of Agriculture of Malaysia visited AVA to discuss areas for collaboration in agriculture.

The Economic & Commercial Counsellor of Spain visited AVA to discuss the current status of the export of meat and meat products from Spain to Singapore.

### September 2009

The Senior Adviser, Biosecurity Standards Pre-Clearance, Ministry of Agriculture and Forestry of New Zealand



visited AVA to discuss AVA's Accreditation Certification Scheme for export of ornamental cut flowers and foliage to New Zealand.

#### **October 2009**

The Permanent Secretary, Ministry of Industry & Primary Resources, Brunei Darussalam visited MAC to explore the possibility of collaboration.

A delegation of five delegates from Beijing Ershang, PRC visited VPHC to understand Singapore's food regulations and to have a better understanding of the best practices in Singapore.

A delegation of nine delegates from Zhejiang Health Inspection Bureau, PRC visited VPHC to understand Singapore's food control system.

#### **November 2009**

A delegation of eight officials from the Shanghai Institute for Food and Drug Control, PRC visited VPHC to understand more about the functions and operations of AVA food laboratories.

#### **December 2009**

A delegation of 37 officials from the Department of Veterinary Services, Malaysia visited VPHC as part of the study programme.

The Head, of the Office of Agriculture, Food Crop & Horticulture, Central Java Province of Indonesia visited the vegetable traders to learn more about the Singapore vegetable industry and market requirements.

#### **January 2010**

A 12-member delegation from Jilin, led by Vice Governor of the Jilin Provincial Government visited AVA to discuss on the Agreement on establishment of a Foot-and-Mouth Disease-free zone in Jilin for the Jilin Food Zone Project. The Director of Animal Health and officials from Jilin, PRC visited APHC to learn about AVA's laboratory testing capabilities.

A delegation of four officers from the Agriculture, Fisheries and Conservation Department of Hong Kong visited VPHC to understand more about the functions and operations of AVA food laboratories.

#### **February 2010**

The Senior Animal and Plant Health Officer of USDA of United States visited AVA to discuss export certification of Niger seeds to the United States.

#### **March 2010**

The Ambassador of Peru visited AVA to discuss export poultry meat products from Peru to Singapore. A six-member delegation from Jilin, led by Standing Committee Member and Director-General of the Organisation Dept of CPC Jilin Municipality visited AVA to seek co-operation with regard to training for the Jilin Food Zone.

A six-member delegation from Hong Kong, led by Secretary for Food & Health visited AVA to exchange views on food supply import control, fisheries policies, and aquaculture issues.

A delegation of six participants from the Thai CP Group visited VPHC to learn AVA's food safety system, and food testing, especially in terms of laboratory equipment used and method of analysis.

The Deputy Head, Embassy of Spain and the Policy Officer, EU delegation to Singapore visited AVA to discuss the issues for the 15th Meeting of the Conference of the Parties to CITES in Doha in March 2010.



**Organisational  
Excellence**



# KNOWLEDGEABLE

Harnessing the power of experience and knowledge, thriving on a culture of teamwork and innovation, our people work hand-in-hand towards AVA's objective of safeguarding the wellbeing of Singaporeans.



# Organisational Excellence

## Synergising People and Resources

**At AVA, we are fully committed to developing and caring for our staff so that they can, in turn, take an active role in contributing to the organisation, as well as the community at large. Sophisticated infocomm technology (ICT) systems formed one of the important tools by which our people are able to achieve organisational excellence as one cohesive body.**

### Developing and Recognising our Staff

AVA firmly believes in nurturing and inspiring our staff to give their best. To underscore our emphasis that having the right staff is our valuable asset, we will continue to develop our staff, both professionally and on the personal front.

#### People Development

In FY2009, we achieved an average of 14 training days per staff. Officers were trained through a variety of training platforms such as external courses at various institutes like Civil Service College, Singapore Institute of Management and British Council, in-house training conducted by our own staff as well as local and overseas conferences.

Under professional development, we sponsored one officer for the Senior Management Programme, one officer for the Developing Dynamic Governance Capabilities Programme, and another officer for the Executive Development Course. We also awarded one undergraduate scholarship in Veterinary Science, as well as sponsored three officers for postgraduate scholarships.

In addition, all new and promoted officers attended induction programmes to familiarise themselves with their new responsibilities.

#### People Management

On the talent management front, to attract a bigger quality pool of talent, AVA adopted a holistic approach

in hiring by riding on the Careers@Gov job portal as the main platform for advertising vacancies in AVA. This strategy has enabled AVA to intensify its manpower recruitment effort to meet organisation demands and at the same time better align AVA's recruitment approach to the Public Service, thus increasing the potential recruitment pool. To fortify our competitive advantage and to better position ourselves in getting the best talent, AVA also participated in the NUS Career Fair 2010 so as to rebrand AVA as an employer of choice for graduating students.

In response to a nation-wide effort to contain diseases, AVA also encouraged and promoted workplace health and safety. H1N1 vaccination was organised for 176 officers performing essential services like inspection and laboratory analysis works. Plans were made for the H1N1 vaccination to be eventually offered to all AVA officers.

#### Awards and Recognition

A total of 49 staff were promoted in 2009 in recognition of their excellent performance and potential to contribute at higher levels.

A total of 21 National Day Awards were bestowed on AVA staff in recognition of their exemplary performance and past service. These comprised two Public Administration Medals (Bronze), two Commendation Medals, two Efficiency Medals and 15 Long Service Medals. In addition, 127 staff received Long Service Awards.

#### Staff Engagement and Feedback

Recognising that staff engagement is key to driving the organisation ahead, emphasis is placed on nurturing employer-employee communication and encouraging them to stay connected with senior management through meet the staff tea sessions. This channel has led to fostering of open relationship and allowed for exchange of views and feedback.



## Quality & Improvement Programmes

AVA seeks to increase its organisational effectiveness and efficiency by participating in various Government initiatives, audits and schemes. The new insights gleaned and the learning opportunities offered continue to take us to a greater height in our journey towards organisational and service excellence.

### Innovation and Work Improvement

At AVA, we empower our staff to increase the effectiveness and efficiency of the organisation by simplifying workflow and seeking innovative and practical solutions to daily work challenges.

Our staff continued to participate actively and contribute useful ideas and solutions through the Staff Suggestion Scheme (SSS) and Work Improvement Team Scheme (WITS). With 3,028 suggestions contributed and 89 WIT projects completed, AVA attained a suggestion ratio of 3.80 and a WIT project ratio of 1.90 respectively for the FY.

Four of AVA's WITs, received Gold, Silver and Bronze awards for their FY2008 projects at the National Innovation and Quality Circle (IQC) assessment held at the 2009 Team Symposium in September 2009. One of the WITs had the opportunity to showcase its project at the PS21 ExCEL Convention 2009 Exhibition, which was held in November 2009.

The new ICT system for managing staff suggestions, Staff PARTICIPATING in Knowledge Sharing (SPARKS) was launched in May 2009. This web-based system allows staff to submit suggestions to improve work processes and the environment. It also serves as an idea bank for the sharing of suggestions among staff.

AVA continued to provide seed funding to support deserving innovation projects. Some \$42.5k was awarded to three project teams, MicroSolve, VNNV ELISA and VeggieTron, in 2009 for developing new diagnostic systems and reagents as well as a novel vegetable growing system.

### Service Excellence

AVA takes pride in delivering high quality and efficient service and we aim to deliver service that is courteous, accessible, responsive and effective. To facilitate the provision of a consistent service experience for customers across all AVA service points and reinforce the importance of quality service, a QS Forum was held on 3 September 2009 during which tokens of appreciation were presented to the officers who received compliments from customers for providing exemplary service.

During the FY, we conducted four rounds of MSS audits with our partner agency, the National Environment Agency, to assess the level of service provided by our frontline officers and to identify areas for improvement. A customer service workshop was also conducted in May 2009 to equip officers with essential skills such as



## Organisational Excellence



effective listening, telephone etiquette, and handling difficult customers. About 260 AVA staff participated in the No-Wrong-Door e-learning course organised by the Civil Service College. Staff also attended a customised workshop on “Public Officers Work on Eliminating Red Tape” or POWER, for short, to train potential facilitators as AVA plans to implement POWER sessions with stakeholders in FY2010.

AVA officers continued to do the organisation proud by receiving service awards at the national level. One officer received the PS21 Service Award at the 2009 PS21 Star Service Award Ceremony held in May 2009. Fifteen AVA staff also received the national 2009 Excellent Service Awards (EXSA).

### Organisational Excellence

As we approach our 10th year of existence in 2010 and in line with the PS21 philosophy to anticipate, welcome and execute change, AVA undertook a comprehensive review to transform and position itself for future challenges in a changing external environment and growing business complexity. Staff were involved in one way or another in the process through contribution in project teams or participation in dialogue and visioning sessions. A new set of vision, mission and values was formulated to galvanise staff to aim higher. To reap greater synergies and efficiency across the organisation, AVA will also be implementing a new organisation structure. These will be rolled out on 1 April 2010.

AVA continued to organise activities to raise awareness of the SQC business excellence framework among staff. A second run of the customised one-day SQC Workshop was conducted for our Division IV staff in August 2009 to promote a better understanding of organisational excellence in AVA. Throughout the year, employees were updated on events and activities through our staff e-newsletter.

## Leveraging On Infocomm Technology

The use of Infocomm Technology (ICT) is key to the processes for a resilient supply of safe food, animal and plant health, and facilitating agri-trade. It is also invaluable for the development of an integrated AVA that delights its customers. In this regard, we have developed processes and procedures to ensure that our ICT systems are aligned to our business needs and are cost effective, as well as developed ICT systems to deliver seamless services to delight our customers and improve our organisational performance.

### Enhancing Internal Processes and Infrastructure

Enhancements and changes are constantly made to the ICT systems to cater for new business requirements. We conduct an annual survey and systems review with the Systems Owners to enhance the respective ICT systems as well as to identify new information requirements.

As an on-going effort to improve ICT security in AVA, we have reviewed and updated the AVA ICT Security Policy to ensure that the policy remains relevant and able to meet the future needs of AVA. The ICT security policy is enforced, and regular security reviews and audits are carried out together with the MND Internal Audit Unit and external auditors.

The AVA Agency-Wide Technical Architecture (AWTA), which was established to facilitate a coherent set of ICT principles, standards and best practices for AVA, was



also reviewed and updated. This has in turn reduced the turnaround time for ICT evaluation, ensured best practices in terms of ICT infrastructure, applications and security, as well as improved inter-operability between ICT systems within the organisation.

#### **Improving Public e-Services**

AVA has been pushing our e-services from simple information publication to interactive, fully transactional e-services, to provide customers with a speedy, efficient and convenient service experience. AVA's Electronic Certificates, Licences and Permits System (e-CLiPS), together with the MTI's Online Business Licensing Service, allows AVA's customers to apply for licences, certificates and permits via the internet at any time and at any place.

The e-CLiPS has been further enhanced to include mobile services for added convenience to dog owners and pet

shop owners. This has enabled both dog owners and pet shop owners to be informed of the status of their licence applications and be reminded prior to the expiry of their licences via SMS.

In addition, the optical watermark has been incorporated into AVA's phytosanitary certificate so as to improve security and increase convenience to our customers, as they would be able to print the certificates themselves in the comfort of their homes or offices.

#### **Bolstering our Safe Food Supply Programme**

The Intelligent Food Approval and Safety Tracking System (iFAST) is key to AVA's food safety and food supply programmes as all food imports are channelled from Singapore Customs' TradeNet System to iFAST for control and management. The business-critical modules on inspection, operations and laboratory analyses

## Organisational Excellence

continue to operate seamlessly and support many AVA departments in their daily operations. In addition, AVA had implemented the Business Intelligence (BI) reports since 2009. These reports have enabled AVA to analyse data collected in iFAST for better and faster decision-making, thus preventing unwholesome food consignments and foodborne hazards from entering into our food chain.

In September 2009, the m-Services and e-Services for iFAST were launched, in conjunction with a mass briefing to about 200 AVA customers. AVA customers are now able to apply online for inspection and consultation appointments, laboratory testing as well as submit daily and monthly statistics to AVA.

### Enhancing our Disease Surveillance Programme

Based on the experience gained from a pilot system, a full-fledged Geographic Information System (GIS) has been identified for development. The tender for the development of the GIS was called in March 2010 and would be awarded in May 2010. The GIS would greatly increase AVA's capability in mapping disease epidemiology and control. The system is designed to leverage on data sharing from SLA and other government agencies for ease of geo-spatial analysis and use.

### Leveraging on Technological Advancement

In FY2009, AVA joined forces with 10 other statutory boards to roll out the new Alliance for Corporate Excellence (ACE) system on 1 April 2010. ACE is an IT project led by the Ministry of Finance (MOF) that pools multiple agencies' requirements for human resource, finance and procurement functions into a common shared system and environment so as to achieve economies of scale. ACE replaces AVA's existing Financial Accounting and Resource Management System (FARM\$) and Human Resource and Payroll System (HRPS). Leveraging on this system has enhanced our capabilities to enable more on-line employee self-services on a 24/7 basis. In addition, real-time and batch interfaces from the e-CLiPS and iFAST have also been built to ACE for customer, billing and payment records. These interfaces facilitate a seamless flow of financial information from the customer to the banks and back to AVA for invoicing, collection and up-to-

date accounting records.

As part of our efforts in facilitating the management of electronic documents, AVA has initiated an e-Registry project. Besides allowing staff to file, store, retrieve and archive documents electronically, the system will also facilitate knowledge sharing and learning amongst staff. The tender for the development of the e-Registry system was called and awarded in March 2010. The system development and file classification plan are in progress, while the full system will be rolled out by December 2010.

A new system, Fund Application System (FAS), which allows the application of the Food Capability Development Fund and the Food Diversification Fund, was developed and rolled out in December 2009. The Staff Participating in Knowledge Sharing (SPARKS) system for the management of Staff Suggestions had also been rolled out to replace the existing system, due to technology obsolescence and changing needs. Improved workflows were incorporated, thus making the overall system more user-friendly.

The Standard ICT Operating Environment (SOEasy) is a major service-wide ICT initiative by MOF and the Infocomm Development Authority (IDA) to consolidate ICT infrastructure services, such as desktop, network and messaging into a single environment. The SOEasy programme is about enabling individual productivity and creating an ICT environment that promotes communication, collaboration and knowledge sharing. Activities such as briefing to AVA staff, migration of AVA network to SOEasy network, compatibility testing of applications used in AVA in SOEasy environment were carried out in FY2009 to prepare for the rollout of SOEasy services to AVA staff in FY2010. Guidelines for SOEasy suites were established and department orders for the various types of suites were finalised. The suite orders will be updated following the restructuring of AVA on 1 April 2010.

AVA had completed a technology refresh cum upgrade for e-CLiPS in December 2009. Both hardware and software were upgraded to cope with the increasing usage of e-CLiPS and improve system performance, whilst keeping the technology up-to-date.



## Tightening ICT Security

ICT security for some critical systems was also improved by conducting security reviews and application penetration tests to discover vulnerabilities and ways to mitigate them. An ICT Seminar was organised to brief staff on our ICT security policy and details on some new security threats as well as new ICT initiatives that AVA was embarking on. Foyer displays were also set up by various vendors in order to give participants a hands-on experience with the systems.

The Disaster Recovery Plan (DRP) exercise was successfully carried out in September 2009. The exercise allowed users of the critical ICT application systems to be familiar with the DRP process, so that AVA can continue to provide its services relying on the critical ICT systems in the event that they are down. A list of observations, problems encountered and the follow-up actions were noted and discussed together with the update of the DRP documents after the exercise.

## Promoting Healthy Lifestyles and Building Esprit de Corps

### Staff Well Being

At AVA, we aim to cultivate a creative and nurturing work environment, which supports work-life balance. In order to help staff achieve an overall wellness in their lives, we

organise a wide variety of recreational, work health and family-life activities all year round.

### Sports

AVA organises an array of sporting activities for our staff, including weekly dragon boat training sessions and badminton training sessions. Our staff also actively participated in numerous sports activities organised by the Ministry of National Development Recreation Club (MNDRC), Civil Service Club (CSC), and other organisations. These activities included badminton, golf and futsal tournaments, dragon boat races, swimming carnivals, bowling competitions, and cross country runs and marathons.

### Social

A total of 225 AVA staff and guests attended the MND Family Day held in July 2009 at East Coast Park. Guest-of-Honour for the event was Mr Mah Bow Tan, Minister for National Development. The family day's activities included exhilarating games, performances and delicious food. The main highlights of the event were the MND's Got Talent and the Telematch. Our AVA telematch team emerged as Champions.

A total of 400 staff and guests attended the AVA Annual Dinner & Dance, held in November 2009 at the Concorde Hotel. The Guest-of-Honour for the event was AVA's Chairman, Mr Koh Soo Keong. Themed "Magical Kingdom – Anime.Superheros.Fairytales," the event enchanted the crowd with fun, games, good food and lucky draws.



## Organisational Excellence



### Healthy and Balanced Lifestyle

AVA understands that a healthy workforce contributes to productivity. We organized monthly Fruit Days where information on the health benefits of the selected fruit/ fruit juice of the month was circulated via email to all staff. Besides that, we had arranged a wide range of activities and talks to encourage healthy living. These included on-site monthly cardio exercises, home workouts and laughter yoga classes. Health talks and workshops such as stress management and ergonomics at workplace and annual health screening and cervical cancer screening were also arranged.

### Welfare

The welfare scheme has exclusively provided hamper deliveries for AVA staff on their 16 newborn babies. There were 13 wreath deliveries made for staff who lost their loved ones. Another four 'get well-soon' hampers were delivered to staff on hospitalization.

## Caring For The Environment And Community

### Environment and Conservation

A nature walk organised for staff in May 2009 saw 12 AVA officers enjoying a relaxing and scenic walk along the Southern Ridges. Another 12 staff participated in the International Coastal Cleanup (ICC) 2009 on 12<sup>th</sup> September at Chek Jawa, Pulau Ubin. The ICC is an annual event held in 70-100 countries, coordinated by the US-based non-profit organisation, the Ocean Conservancy. In their efforts to save the environment, AVA volunteers collected a total of more than 60kg of litter within an hour. Seven staff took part in the Boardwalk @ MacRitchie Reservoir Park in December 2009 to support environment outreach. In raising awareness on global warming and electrical energy usage, AVA colleagues were encouraged to observe "Earth Hour" which fell on 28<sup>th</sup> March 2010.



## Community Outreach

### Orange Ribbon Ambassador

In July 2009, AVA colleagues participated in the National Orange Ribbon Pledge by contributing 838 pledges on racial harmony. The Orange ribbon is aimed at rallying the community to pledge and promote the spirit of friendship and harmony amongst Singapore's multi-racial and multi-religious society, as well as to the Singapore Youth Olympic Games 2010. As AVA contributed more than 500 pledges, AVA was honoured with the Orange Ribbon Ambassador Award.

### Home Adoption

As part of our community outreach programme, AVA Community and Environmental Outreachers (C.E.O.s) organised activities for the residents of Kampong Senang Charity and Education Foundation (KSCEF), AVA's adopted home. Our C.E.O.s also brought joy to residents by celebrating festivals together with them. During the Mid-Autumn Festival in 2009, the C.E.O.s entertained the elderly and the children with a light-hearted talk on the Mid-Autumn Festival, mooncakes, pomelos and a merry karaoke session.

### Donation Drives

The President's Challenge 2009 Heart Train saw AVA colleagues contributing a total of \$3,814 to the 40 charity organisations supported by the President's Challenge 2009. An avid contributor to Community Chest, AVA was again awarded the SHARE Gold Award for FY2009.

In September 2009, staff of AVA colleagues contributed \$3,365 to earthquake victims in Padang via Network Indonesia, which is a networking platform driven by IE Singapore to foster business linkages between Singapore and Indonesia.

As a lead up to AVA's 10<sup>th</sup> Anniversary Celebrations, three Charity Cafes were successfully organised to raise funds for AVA's adopted charity, Kampong Senang. Through



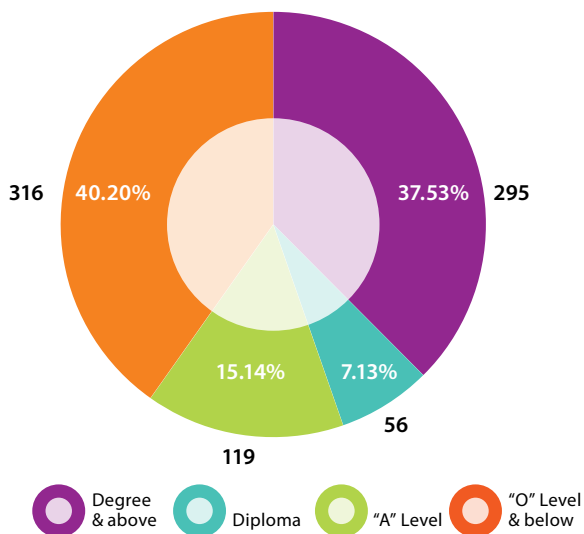
the brisk sale of food at the cafes and generous staff donations, a total of \$16,988.88 was collected. The money would be presented to the charity during the AVA Staff Conference on 1<sup>st</sup> April 2010.

### Staff Strength\*\* (till 31 Mar 2010)

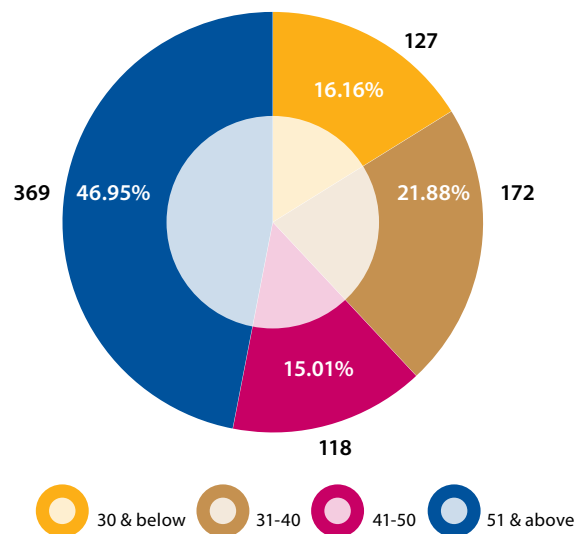
Categories of Staff	Food & Veterinary Administration	Food Supply & Technology	Corporate Development & Support	Total
Management/Professional	195	46	51	292
Technical Support	160	93	3	256
Non-Technical Support	41	13	42	96
Operation Support	60	78	4	142
<b>Grand Total</b>	<b>456</b>	<b>230</b>	<b>100</b>	<b>786</b>

\*\* Excluding temp staff

#### Distribution of Staff by Qualifications



#### Distribution of Staff by Age Group



### Performance in WITS For FY09/10

Holding strength	No. of WITs	No. of completed projects	No. of implemented projects	Project ratio
788	46	89	74	1.90

### Performance in SSS For FY09/10

Holding strength	No. of staff with at least one suggestion	No. of suggestions	No. of suggestions accepted implementation	Participation rate	Suggestion ratio
788	721	3028	1190	92%	3.80

# Performance Indicators

## Veterinary Public Health and Food Safety

### Outcome Indicators objectives

OBJECTIVES	OUTCOME INDICATORS FOR FY2009	FY2009 ACTUAL PERFORMANCE	PROJECTED TARGET FOR FY2008
Ensuring a resilient supply of safe and wholesome food to Singapore	Number of cases of foodborne illnesses per 100,000 population	There were 72.4 foodborne illnesses cases per 100,000 population.	Not more than 60 cases per 100,000 population.
	Number of key food items which has less than 50% of supply from a single country	Achieved for key food items of pork, chicken, fish, vegetables and fruits except for hen eggs where imports from Malaysia were about 77%	Target: 5 out of 6

### Output Indicators

ACTIVITY	ACTUAL VOLUME FY2009	ACTUAL ACHIEVED FY2009	PROJECTED OUTPUT FOR FY2009
Inspection of vegetables and fruits, meat and high risk seafood, animal and animal products, meat and fish establishment, vegetable farms, processed food products and premises	146,926 inspections conducted	120.0%	To conduct 122,534 inspections
Accreditation of overseas food sources	86 inspections visits	117.8 %	To conduct 73 inspection visits
Testing food samples	91,185 food samples	129.9 %	To test 70,200 food samples
Conduct laboratory tests	2,292,883 laboratory tests	137.3 %	To conduct 1,670,000 laboratory tests
Business cluster meetings/ trade association meetings	5 business cluster/ trade association meetings	62.5 %	8 business cluster/ trade association meetings
Trade mission	5 food sourcing/ agri-business missions	120.0 %	4 food sourcing missions

## Performance Indicators

### Animal and Plant Health

#### Outcome Indicators objectives

OBJECTIVES	OUTCOME INDICATORS FOR FY2009	FY2009 ACTUAL PERFORMANCE	PROJECTED TARGET FOR FY2009
Safeguard animal and plant health	Percentage freedom from important animal and plant disease outbreaks	97.3% freedom or free from outbreaks of at least 108 out of 111 important animal and plant diseases	95% freedom or free from outbreaks of at least 105 out of 111 important animal and plant diseases
	Number of cases of animal welfare violations per 1 million population	0 cases	Not more than 6 cases of animal welfare violations per 1 million population

#### Output Indicators

ACTIVITY	ACTUAL VOLUME FY2009	ACTUAL ACHIEVED FY2009	PROJECTED OUTPUT FOR FY2009
Prevention and control of diseases of animals and plants	11,790 inspections	127.0%	To carry out 9,280 Inspections
Control of animal nuisance and animal cruelty	225,488 laboratory tests	139.2%	To carry out 162,000 laboratory tests
	12,908 investigations carried out	92.2%	To carry out 14,000 investigations

### Food Supply and Technology

#### Outcome Indicators objectives

OBJECTIVES	OUTCOME INDICATORS FOR FY2009	FY2009 ACTUAL PERFORMANCE	PROJECTED TARGET FOR FY2009
Management of the local agri-industry (farming) sector	Level of productivity of vegetable and fish farms in Agrotechnology Parks, and floating fish culture farms	Achieved level of productivity for fish farming at 142 tonnes/ha and for vegetable farming at 294 tonnes/ha	Target: 220 tonnes/ha (aquaculture production) and 200 tonnes/ha (vegetable production)

#### Output Indicators

ACTIVITY	ACTUAL VOLUME FY2009	ACTUAL ACHIEVED FY2009	PROJECTED OUTPUT FOR FY2009
Management of agrotechnology parks	Managed 227 farms in agrotechnology parks;	99.5%	To manage 228 farms;
	104 floating fish culture farms	99%	105 floating fish culture farms
Technology development and services	Completed 21 R&D projects;	100%	To complete 21 R&D projects;
	and 14 service projects	100%	and 14 service projects
Management of fishery ports and markets	Handled 73,724 tonnes of fish	98.3%	To handle 75,000 tonnes of fish



## Performance Indicators

### Agri-Trade Facilitation Services

#### Outcome Indicators objectives

OBJECTIVES	OUTCOME INDICATORS FOR FY2009	FY2009 ACTUAL PERFORMANCE	PROJECTED TARGET FOR FY2009
Facilitate trade of animal, plant and food products	Percentage of certified export consignments that are rejected by importing countries	0% of certified export consignments rejected by importing countries	0.3% of certified export consignments rejected by importing countries

#### Output Indicators

ACTIVITY	ACTUAL VOLUME FY2009	ACTUAL ACHIEVED FY2009	PROJECTED OUTPUT FOR FY2009
Animal, plant and food products	73,304 export documents issued	109.9 %	To issue 66,750 export documents
	758,320 import documents issued	111.0 %	To issue 685,950 import documents

### International and Regional Commitments

#### Outcome Indicators objectives

OBJECTIVES	OUTCOME INDICATORS FY2009	FY2009 ACTUAL PERFORMANCE
Represent the government internationally on matters related to or connected with the agri-food and veterinary sectors	Fulfill Singapore's international obligations in SEAFDEC, ASEAN, APEC and CITES	Fulfilled
	Singapore's interests in agri-food and veterinary sectors are not compromised	Achieved

#### Output Indicators

ACTIVITY	ACTUAL VOLUME FY2009	TARGET ACHIEVED FY2009
To manage Marine Fisheries Research Department (MFRD) (SEAFDEC) through the provision of infrastructure (land, buildings and supporting facilities) and local staff and implement CITES regulations	Fulfilled	100%
To participate in relevant meetings and activities of AMAF, OIE, SEAFDEC, CITES, CODEX Alimentarius, Bilateral, WTO FTA, APEC, ASEM and IPPC	49 Meetings attended	100%

# Statistics

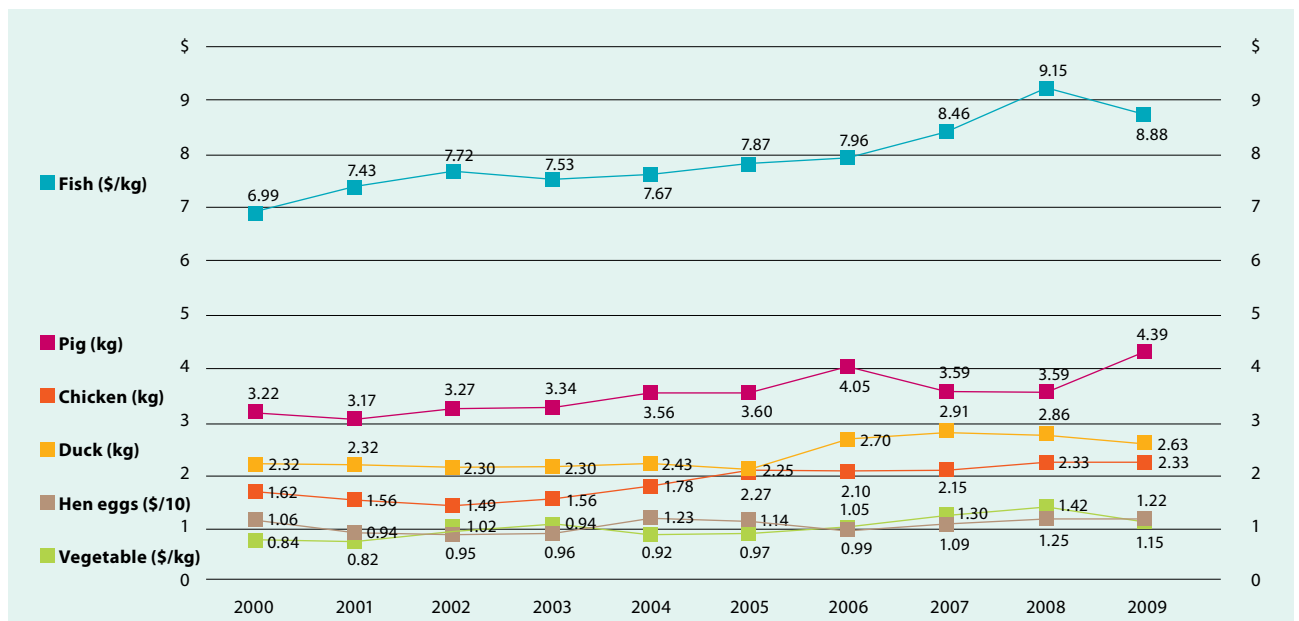
## Consumption, Import & Local Farm Production Figures (Jan - Dec 2009)

	Beef (Tonnes)	Chicken (Tonnes)	Cooking Oil (Tonnes)	Duck (Tonnes)	Fish (Tonnes)	Fruits (Tonnes)	Hen Eggs (Million pcs)	Mutton (Tonnes)	Pork (Tonnes)	Rice (Tonnes)	Sugar (Tonnes)	Vegetables (Tonnes)
<b>Consumption</b>	19772	157552	129797	13423	81926	344862	1497.3	10540	95287	245869	242916	418094
<b>Import</b>	27897	163289	441934	13561	82000	365300	1164.7	10740	96268	278286	346895	411246
<b>Local Farm Production</b>		1436			5689		333.2					19584

## Per Capita Consumption

	2002	2003	2004	2005	2006	2007	2008	2009
<b>Beef (kg)</b>	3.7	4.7	4.3	3.7	3.8	4.3	4.0	4.0
<b>Chicken (kg)</b>	35.8	38.0	31.8	32.3	29.2	33.0	32.7	31.6
<b>Duck (kg)</b>	4.0	3.8	2.6	3.5	2.9	3.2	3.1	2.7
<b>Fish (kg)</b>	23.9	23.4	23.0	21.2	20.8	19.5	17.4	16.4
<b>Fruits (kg)</b>	86.8	83.7	80.9	79.3	75.6	72.3	70.0	69.1
<b>Hen eggs (pcs)</b>	281.6	307.5	267.8	285.3	291.4	301.6	300.4	300.2
<b>Mutton (kg)</b>	2.0	2.1	2.0	1.8	1.9	2.0	2.0	2.1
<b>Pork (kg)</b>	18.1	20.1	20.8	19.3	20.1	20.6	19.2	19.1
<b>Vegetables (kg)</b>	83.6	84.8	85.5	84.1	84.2	83.8	82.6	83.8

## Ex-farm Price for Primary Produce (from Jan - Dec each year)



## Statistics

### Major Sources of Supply



## Statistics

### Accreditations, Suspensions and Re-instatement of Pig and Poultry Farms (FY09/10)

	Type of Farms					Total
	Pig	Chicken Broiler	Duck Broiler	Chicken Layer	Chicken Breeder	
<b>No. of new farms accredited</b>	0	3	2	2	0	7
<b>No. of farms suspended / delisted</b>	0	16	2	1	0	19
<b>No. of farms re-instated</b>	0	5	2	1	1	9

### Trade Documentation and Import Inspection Figures FY09/10

	Meat and Meat Products	Fish and Fish Products	Fruits and Vegetables	Processed Food
No. of traders registered	2,560		1,005	13,452
No. of import permits issued	20,949	185,361	207,523	264,026
Quantity and value of products approved for import	259,730 tonnes \$1,005 mil	212,348 tonnes \$1,187 mil	851,018 tonnes \$866 mil	3,208,048 tonnes \$7,315 mil
No. of consignments inspected	68,411	1,957	12,365	9,918
Quantity and value of imported products inspected	251,636 tonnes \$977.2 mil	14,743 tonnes \$59.2 mil	10,779 tonnes \$16.9 mil	120,508 tonnes \$274 mil
No. of consignments rejected	64	15	375	112
Quantity and value of consignments rejected	624.292 tonnes \$1.8863 mil	69.8751 tonnes \$0.4966 mil	126.3885 tonnes \$0.2363 mil	52 tonnes \$0.2334 mil

### Illegal Imports Intercepted FY09/10

	Meat and Seafood	Eggs (poultry)	Animals and Birds	CITES	Processed Food
<b>Total no. of cases in FY</b>	17	9	98	24	169
<b>No. prosecuted in Court</b>	5	1	5	0	0
<b>No. compounded</b>	10	0	6	14	33
<b>No. warned</b>	2	0	80	10	136
<b>Others (relevant particulars not available, no action required)</b>	0	8 (disposed by ICA)	7	0	0



## Statistics

### Farming Activities in Singapore as at March 2009

	No. of Farms	Net Area (Hectares)
<b>FISH</b>		
Aquarium fish (breeding/ export)	92	171.160
<b>FOODFISH AND SHRIMP (LAND-BASED)</b>		
Freshwater	2	8.464
Marine	3	19.173
<b>ANIMALS AND BIRDS</b>		
Layer (hen eggs and SPF eggs)	5	61.626
Quail and other gamebirds	2	4.724
Exotic birds	4	10.175
Dairy cattle and goats	4	9.396
Frogs and crocodiles	3	9.859
Dogs (breeding/boarding/training)	10	9.510
<b>PLANTS</b>		
Vegetables (including mushrooms, bean sprouts, etc)	55	119.686
Fruits	1	3.545
Orchid and ornamental plants	82	297.228
Aquatic plants	2	11.743
Fodder crops	1	4.700
<b>TOTAL (land-based)</b>	<b>266</b>	<b>740.989</b>
Foodfish/crustaceans/molluscs (sea-based)	104	82