



Working Together as One

ANNUAL REPORT 2014/15

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 our customers, 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.

AWARDS & ACCOLADES

ISO/IEC 17025 SAC-SINGLAS ACCREDITATION AWARDS

received by:

- » Veterinary Public Health Laboratory since 2000, with 14 new tests accredited in FY 2014
- » Animal Health Laboratory since January 2005, with 3 new tests accredited in FY 2014
- » Plant Health Laboratory since June 2005, with 3 new tests accredited in FY 2014

WORLD ORGANISATION FOR ANIMAL HEALTH (OIE) COLLABORATING CENTRE FOR FOOD SAFETY

designation received by:

- » Veterinary Public Health Centre since May 2014

ASEAN REFERENCE LABORATORY FOR PESTICIDE

designation received by:

- » Veterinary Public Health Laboratory since 2004

ASEAN REFERENCE LABORATORY FOR ENVIRONMENTAL CONTAMINANTS

designation received by:

- » Veterinary Public Health Laboratory since 2014

MINISTRY OF NATIONAL DEVELOPMENT MINISTER'S (TEAM) AWARD

received for "Piloting First Responder Protocol on Animal-Related Feedback" project

EXCELLENCE IN PUBLIC SERVICE AWARDS 2014

Best Practice Award for Inter-agency Collaboration on Animal-related issues

ONG TENG CHEONG LABOUR LEADERSHIP INSTITUTE'S WORKPLACE PARTNERSHIP AWARD 2014

received jointly with AUSBE

SHARE SILVER AWARD 2014



The tangram is a Chinese geometrical puzzle that can be arranged into many different shapes. Like the tangram, at AVA, each staff member is an integral part. Together, we shape robust programmes and create innovative ideas that help us protect the well-being of Singapore.



Food Supply Resilience

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Agrotechnology

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Food Safety

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Agri-trade

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Animal Health and Welfare

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Organisational Excellence

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Plant Health

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CHAIRMAN'S STATEMENT

Amidst a challenging environment across our areas of responsibility, AVA continued to strengthen food security, enhance animal welfare, improve plant health, and facilitate agri-trade. We achieved all these because the AVA team worked seamlessly and ceaselessly as one. Our progress in organisational transformation also contributed to our success. In line with the ethos of Public Service Transformation, which calls for us to be more citizen-centric and keep public trust, we have more deeply internalised the value of engaging the public and our stakeholders. /



From left: Mr Lee Kwong Weng (AVA Deputy CEO for Corporate & Technology), Ms Tan Poh Hong (AVA CEO), Dr Gardner Murray (Chair of International Advisory Committee of Experts), and Dr Chew Siang Thai (AVA Deputy CEO for Regulatory Programmes & Operations & Director-General for Agri-Food & Veterinary Services).

ENSURING FOOD SECURITY

With global pressures exerting from the geopolitical, economic, biological, and environmental spheres, it takes more effort now than ever before for AVA to safeguard food security and ensure our nation's well-being. Rising expectations from the public and our stakeholders also add complexity to the task. Despite the trying milieu, AVA continued to maintain a continuous supply of safe food for Singapore during the FY.

I am proud that our food safety programme was again deemed to be of a world-class standard in the 6th review by the International Advisory Committee of Experts (IACE) in 2014. In addition, the Economist Intelligence Unit ranked Singapore 5th in its 2014 Global Food Security Index (up from 16th the year before).

SOURCE DIVERSIFICATION

By actively diversifying food sources, AVA ensures that occasional supply disruptions from specific sources do not significantly impact the availability of any type of food in Singapore.

During the FY, we continued to expand and diversify into many more overseas food sources. For example, we added a new source of frozen pork from Sarawak and resumed the import of beef cuts from the UK. We also lifted import suspensions on bovine offal and processed beef from the USA, and on bovine offal from Japan. These additional sources were granted approval to enter Singapore only after having met AVA's stringent food safety regulations and standards.



AVA officers conducting inspection at a pig farming area in Sarawak.



Whether it is in the area of food security, animal health and welfare, or plant health, the work we do is inter-related and inter-dependent. In ensuring the well-being of Singaporeans, we must continue to do our utmost as One AVA.



Mr Koh Soo Keong
Chairman





A concrete platform at the new Lorong Halus jetty facilitates the loading and unloading of fishes and materials using a lorry crane.

LOCAL PRODUCTION AND PARTNERSHIP

Local farms are an integral component in our strategy to maintain a resilient food supply. To help local farms achieve even higher productivity and use farmland more efficiently, a new \$63 million Agriculture Productivity Fund (APF) was launched in August 2014. With the APF, the government aims to cultivate farming into a high-technological and innovative sector that makes efficient use of land and labour.

In addition, the \$3.85 million Lorong Halus jetty was launched in July 2014, to support the operations of fish farms in the eastern Johor Straits. Several fish farmers were involved in the design of this new jetty, including the layout and types of facilities required. The amenity has provided greater convenience and helped these farmers save time in travelling, all of which resulted in higher productivity.

To all local farmers, AVA continued to provide technical advisory through workshops and seminars on topics related to production technology and good agricultural practices. AVA also encourages consumers to choose local produce. The Good Aquaculture Practice for Fish Farming Scheme was launched during the FY to raise the profile of local fish produce, and provide a mark of assurance of safety and quality.

FOOD SAFETY

Singaporeans love a wide variety of food. Behind the scenes, AVA leaves no stone unturned to make sure all food produced in and imported into Singapore is safe. Our repertoire of food testing capabilities grew yet again. Advances were made in identifying viral or bacterial sources of outbreaks, and in tracing geographical origins of food items. Recognising our proficiency, the World Organisation for Animal Health (OIE) endorsed AVA's Veterinary Public Health Centre as the first OIE Collaborating Centre for Food Safety in Southeast Asia. This role creates opportunities for more international collaboration and allows AVA to keep abreast of global challenges and developments.

To stay ever-prepared and sustain this success, AVA needs to be forward-looking and far-sighted. A Food Safety Roadmap 2020 was developed to serve as a strategic framework in the long run. This roadmap will chart our direction towards achieving international recognition for Singapore's integrated food safety system – one that is distinguished for its excellence in performance, robustness, professionalism, and strong stakeholder partnerships.



Dr Wong Hon Mun (Group Director for Agri Establishment Regulation, AVA) receives the Best Practice Award for Inter-agency Collaboration on animal-related issues from Mr Teo Chee Hean (Deputy Prime Minister).

SAFEGUARDING ANIMAL HEALTH

With Singapore being a major trade hub for food and animals, AVA continued to have in place bio-security measures to keep Singapore free of major animal diseases during the FY. As part of its review, IACE found AVA's bio-security programme to be of international standards, and applauded our whole-of-government approach in preventing zoonotic diseases. The experts also praised our progress in defining contingency plans for disease incursions.

Indeed, AVA has continued to successfully keep important animal diseases at bay. During the FY, OIE recognised Singapore as free from Contagious Bovine Pleuropneumonia and Peste des Petits Ruminants. These are two significant and highly contagious viral diseases affecting cattle, sheep, and goats in the region. Although Singapore does not have a large livestock industry, we have a significant transshipment and re-export market for animals. An outbreak of such diseases can have a devastating impact on the livestock industry. In addition, our emergency preparedness for a potential rabies outbreak was successfully tested in an exercise during the FY.

In ensuring animal health, veterinarians have a crucial role to play. A visioning exercise was conducted with private veterinarians to foster collaboration and focus our collective efforts towards achieving a common vision for the profession. This is another good example of how AVA has been working more closely with stakeholders for mutual benefits.

STRIDES IN ANIMAL WELFARE AND MANAGEMENT

The Animal Welfare Legislation Review Committee (AWLRC), which AVA provided secretariat support to, brought together diverse groups of stakeholders to work towards the common goal of raising animal welfare standards in Singapore. As a result, a total of 24 recommendations were put up and subsequently accepted by the Ministry of National Development. Following this, a Private Member's Bill was successfully passed in Parliament to amend the Animals and Birds Act. The amendments would give effect to some of these recommendations.

The Multi-stakeholder Collaboration Committee, which AVA is also involved in, is following up on AWLRC's recommendations. With the effort and dedication from stakeholders involved, I am certain that we will further advance the standards of animal welfare in Singapore.

AVA also intensified its work as the first responder for animal-related feedback. Since taking on the role, a whole-of-government approach has been adopted to facilitate effective communication and collaboration, as well as to iron out operational and policy issues among relevant agencies. Our efforts were recognised, as we received the Best Practice Award (Inter-agency Collaboration) at the Excellence in Public Service Awards 2014.



On 12 December 2014, AVA said its final goodbye to its headquarters at Maxwell Road.

ORGANISATIONAL EXCELLENCE AND MANAGEMENT

The FY saw us continuing to make progress in our journey towards Public Sector Transformation. Desired behaviours that exhibit AVA's corporate values and actions for the leadership team were developed to guide us, and I cannot emphasise enough on the importance of good leadership and teamwork as we set foot together on this journey. The AVA family exhibited these values commendably, during the major exercise of relocating AVA's headquarters from Maxwell Road to Jurong East. The relocation took three years of preparation and involved hundreds of officers. There was only one goal: to move into our new home and continue to fulfil the organisation's mission as One AVA.

With the successful relocation, AVA is now better equipped to provide improved customer service. A brand new Customer Service Centre was set up,



We welcomed our first customers, who were from Japan, at our new Service Centre in JEM Office Tower on 15 December 2014.

where processes are streamlined and the space designed to enhance the customer experience. At the same time, we sought feedback from our stakeholders and members of the public at various stages of AVA's website revamp. Thanks to their active participation and insightful comments, a more user-friendly website with easily accessible information was launched during the FY.



AVA's new Service Centre is filled with sunlight, uplifting colours, and a range of features that enhance the customer experience.



Working together as one, AVA successfully relocated our headquarters to JEM Office Tower in December 2014.

MOVING FORWARD AS ONE AVA

Whether it is in the area of food security, animal health and welfare, or plant health, the work we do is inter-related and inter-dependent. In ensuring the well-being of Singaporeans, we must continue to do our utmost as One AVA. Moving forward, a proactive stance must also be embraced in overcoming challenges and seizing opportunities. At the same time, to better discharge our mission, we need to further engage our stakeholders – not just to improve service delivery; I also encourage the AVA family to aim for breakthroughs in collaborative solutions and innovations.

I am confident that together, we will meet and exceed our goals. AVA has a rich historical legacy to build its success on. As Singapore celebrates SG50 – our Golden Jubilee – in 2015, AVA also celebrates its 15th anniversary. Including the years of services provided by our predecessor organisation – Primary Production Department – we have supported nation-building for more than half a century now, and done so with a good record of achievement.

Lastly, I would like to say a big thank you to all AVA staff, the leadership team led by the Chief Executive Officer Ms Tan Poh Hong, and fellow Board members, including those who stepped down on 31 March

2015. Your resolution and concerted effort as One AVA has made all our achievements possible. At the heart of AVA's future success is our team. We must continue to live out our ExCITE values of Excellence, Care, Integrity, and Teamwork in all we do. With this passion, I am convinced that AVA can reach even greater heights in the coming year.

Koh Soo Keong
Chairman

BOARD OF DIRECTORS



01. CHAIRMAN, MR KOH SOO KEONG

- » Managing Director, EcoSave Pte Ltd
- » Chairman, ABL Asia Pte Ltd
- » Chairman, Ascendas Funds Management (S) Ltd
- » Independent Director, NOEL Gifts International Ltd
- » Independent Director, Northern Technologies International Corporation
- » Director, Zerust Singapore Pte Ltd
- » Director, Agape Ace Pte Ltd
- » Director, Orita Sinclair-School of Design, New Media & the Arts Pte Ltd
- » Independent Director, ECS Holdings Ltd (till 25 Feb 2015)
- » Director, Sino-Singapore (Chengdu) Innovation Park Development Co Ltd (till 28 Feb 2015)

02. DEPUTY CHAIRMAN, MR LIM NEO CHIAN (W.E.F. 1 APR 2015)

- » Director, Supreme Wealth Development Sdn Bhd
- » Director, Home Nursing Foundation
- » Director, Innospring Development Pte Ltd
- » Director, Zhi*Lim Pte Ltd
- » Director, Economic Development Innovations Singapore Pte Ltd
- » Chairman & Director, Ascendas Hospitality Fund Management Pte Ltd
- » Chairman & Director, Ascendas Hospitality Trust Management Pte Ltd
- » Deputy Chairman, Gardens by the Bay
- » Director, Singapore Cruise Centre Pte Ltd

03. MS TAN POH HONG

- » Chief Executive Officer, Agri-Food and Veterinary Authority
- » Board Member, Singapore Corporation of Rehabilitative Enterprise (SCORE)
- » Director, AgriFood Technologies Pte Ltd
- » Member, Liquors Licensing Board
- » Member, Tropical Marine Science Institute Management Board

04. MRS LEE AI MING

- » Senior Consultant, Rodyk & Davidson LLP
- » Independent Director, Keppel Land Ltd
- » Independent Director, HTL Holdings Ltd
- » Member, Singapore Copyright Tribunal
- » Member, Steering Committee for IP Competency Framework

05. MR PETER CHIA

- » Chief Operating Officer, Temasek Life Sciences Laboratory Ltd
- » Chief Executive Officer, Temasek Life Sciences Ventures Pte Ltd
- » Commissioner, PT Monfori Nusantara
- » Director, Bioforest Pte Ltd
- » Director, Tridel Biosciences International Pte Ltd
- » Director, JOil (S) Pte Ltd
- » Director, JOil Africa Pte Ltd

06. MR YEO GUAT KWANG

- » Assistant Secretary-General, NTUC
- » Supervising Lead, Hospitality and Consumer Business
- » Chairman, Migrant Workers Centre
- » Co-Chairman, GEMS Up CCI Working Committee
- » Member of Parliament
- » Director, NTUC

07. MR TAN KOK YAM

- » Chairman, Agri-Food Technologies Pte Ltd

08. MR EUGENE WONG

- » Chairman, Crimson Logic Pte Ltd
- » Founder and Managing Director, Sirius Venture Capital Pte Ltd
- » Non Executive Director, Sirius SME Growth Partners I Ltd
- » Non Executive Director, Sirius Angel Fund Pte Ltd
- » Non Executive Director, Sirius Investment Inc
- » Non Executive Director, Ajsen (China) Holdings Ltd
- » Non Executive Director, Japan Food Holdings Ltd
- » Non Executive Director, Jason Marine Ltd
- » Non Executive Director, International Enterprise (IE) Singapore Board
- » Non Executive Director, Neo Group Ltd
- » Non Executive Independent Director, TMC Education Corporation Ltd
- » Non Executive Director, Singapore Kitchen Equipment Ltd
- » Non Executive Director, Cargo Community Network Pte Ltd
- » Non Executive Director, Singapore Cruise Centre Pte Ltd

09. MR DILEEP NAIR

- » Singapore High Commissioner to Ghana
- » Independent Director of Thakral Corporation Ltd
- » Independent Director of Keppel Data Centre Reit Management Ltd
- » Senior Advisor to Hyflux Ltd
- » Senior Advisor to Atlantic Navigations Holdings Ltd

10. PROF CHAN CHIN TUONG DAVID (W.E.F. 1 APR 2015)

- » Lee Kuan Yew Fellow & Professor of Psychology
- » Director, Behavioural Sciences Institute, Singapore Management University
- » Co-Director, Centre for Technology and Social Behavioural Insights, A*STAR-SMU
- » Member, International Panel of Experts, Urban Redevelopment Authority
- » Member, Resource Panel for National Environment Agency
- » Member, International Advisory Board of the Centre for the Advancement of Research Methods and Analysis, USA
- » Member, Research Advisory Panel, National Population and Talent Division, Prime Minister's Office
- » Member, Public Hygiene Council
- » Member, Governing Board, Workplace, Safety and Health Institute
- » Member, Board of Directors, Singapore Corporation Of Rehabilitative Enterprises
- » Chairman, International Advisory Panel to the National Addictions Management Service and National Council on Problem Gambling
- » Member, National Council on Problem Gambling

11. MS CHUA MUI HOONG (W.E.F. 1 APR 2015)

- » Opinion Editor, The Straits Times, Singapore Press Holdings

12. MS HARASHA BINTE KHALID BAFANA (W.E.F. 1 APR 2015)

- » Founder & Director, Adam & Hawa Network
- » ExCo Member, Creative Arts & Culture

13. MR LAU TECK SIEN (W.E.F. 1 APR 2015)

- » Partner & Chief Investment Officer, HOPU Investment

14. COL (DR) TANG KONG CHOONG (W.E.F. 1 APR 2015)

- » Chief Naval Medical Officer, Changi Naval Base

15. PROF ZHOU WEIBIAO (TILL 31 MAR 2015)

- » Director, Food Science and Technology Programme, Department of Chemistry, National University of Singapore (NUS)
- » Council Member, Singapore Institute of Food Science and Technology (till 24 Apr 2014)
- » Member, Food Standards Committee, SPRING Singapore, MTI Singapore
- » Member, Food Manufacturing Independent Expert Panel, SPRING Singapore, MTI Singapore
- » Member, Panel of Experts, Advertising Standards Authority of Singapore
- » Member-at-large, Executive Committee, International Society of Food Engineering
- » Governing Board Member, The International Food Information Service (IFIS Publishing), Limited, UK

16. DR AZLINDA ANWAR (TILL 31 MAR 2015)

- » Assistant Director (Research & Enterprise Development), Temasek Life Sciences Laboratory Ltd
- » District Councillor, South West CDC 6th Council

17. RADM (DR) KANG WEE LEE (TILL 31 MAR 2015)

- » Chief of Medical Corps, Singapore Armed Forces

18. MR TEO ENG CHEONG (TILL 31 MAR 2015)

- » Chief Executive Officer, International Enterprise (IE) Singapore
- » Chairman, IE Singapore Holdings Pte Ltd
- » Independent Director, Ascendas Funds Management (S) Ltd
- » Board Member, Council for Private Education
- » Board of Director, ASEAN Infrastructure Fund Ltd
- » Deputy Chairman, Singapore Cooperation Enterprise
- » Advisory Board of Singapore Management University's Lee Kong Chian School of Business

19. MR FELIX SOH (TILL 8 DEC 2014)

- » Editor, Digital Media Group, Digital Division, Singapore Press Holdings Ltd

LEADERSHIP TEAM



02



01



03



04



05



06

01. MS TAN POH HONG
» Chief Executive Officer

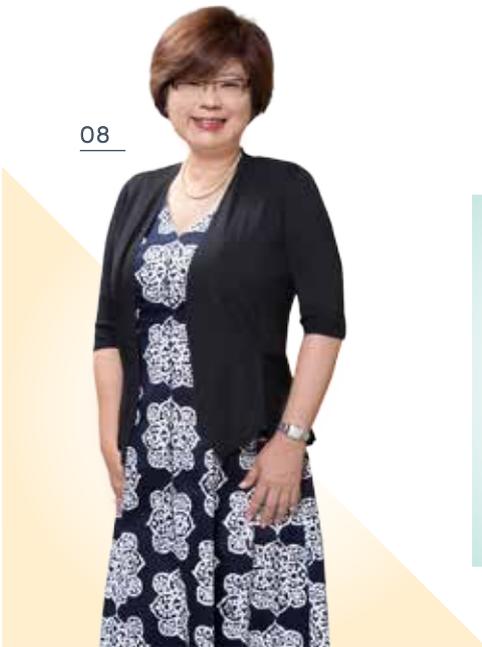
02. DR CHEW SIANG THAI
» Director-General for Agri-Food & Veterinary Services
» Deputy Chief Executive Officer (Regulatory Programmes & Operations)
» Chief Veterinary Officer

03. DR TAN LEE KIM, KIM
» Deputy Chief Executive Officer (Corporate & Technology)
» Group Director, Planning & Organisational Excellence

04. MR FOO SIANG MING
» Group Director, Technology & Industry Development

05. MRS TAN-LOW LAI KIM
» Group Director, Food Supply Resilience

06. MS MELIN LIM
» Group Director, Corporate Resource Management



07. DR ASTRID YEO
» Group Director, Regulatory Administration

09. DR CHUA TZE HOONG
» Group Director, Quarantine & Inspection

11. DR WONG HON MUN
» Group Director, Agri Establishment Regulation

08. DR CHOO LI NAH
» Group Director, Communications & Corporate Relations

10. MR LESLIE PHUA
» Group Director, Food Establishment Regulation

12. DR PAUL CHIEW
» Group Director, Laboratories

ORGANISATIONAL CHART AND

CHIEF EXECUTIVE

CORPORATE & TECHNOLOGY

PLANNING & ORGANISATIONAL EXCELLENCE GROUP

- » Horizon scanning
- » Strategic planning and policy
- » Emergency planning
- » Organisational excellence
- » Board secretariat

CORPORATE RESOURCE MANAGEMENT GROUP

- » Financial management and procurement
- » Human resource management
- » Information communication technology management
- » Corporate administration and facilities management
- » Legal services

COMMUNICATIONS & CORPORATE RELATIONS GROUP

- » Media relations
- » Corporate publications
- » Community outreach
 - Food safety and supply
 - Responsible pet ownership
- » Customer relations
- » International relations

TECHNOLOGY & INDUSTRY DEVELOPMENT GROUP

- » Technology development and transfer
 - Horticulture
 - Aquaculture
 - Post-harvest
- » R&D planning
- » Technical assistance and services

FOOD SUPPLY RESILIENCE GROUP

- » Food supply resilience
 - Policy and planning
 - Source diversification
 - Funding assistance for local farms
 - Contingency planning
 - Agriculture land planning, development, and sales
- » Fisheries management
- » Fishery ports management

KEY ROLES OF GROUPS

OFFICER (CEO)

REGULATORY PROGRAMMES & OPERATIONS

REGULATORY ADMINISTRATION GROUP

- » Policy, legislation and programme review
- » Risk assessment
 - Food safety
 - Animal health
 - Plant health
- » Food source accreditation
- » Investigation and prosecution

QUARANTINE & INSPECTION GROUP

- » Import control
 - Food
 - Animals
 - Plants
- » Quarantine services
- » Export facilitation

FOOD ESTABLISHMENT REGULATION GROUP

- » Regulation of local food establishments
 - Food factories
 - Slaughterhouses
- » Grading of food factories
- » Technical assistance and services
- » Export facilitation

AGRI ESTABLISHMENT REGULATION GROUP

- » Regulation of local farms
- » Animal welfare and management
- » First Responder on animal-related issues
- » Regulation of animal and plant establishments and feed mills
- » Regulation of veterinary services and standards

LABORATORIES GROUP

- » Testing, diagnostic services and scientific expertise
 - Food safety
 - Animal health
 - Plant health
- » R&D of new test methodology
- » Export certification testing

CALENDAR OF EVENTS

APRIL 2014 ▶ AVA hosted the 46th Meeting of the SEAFDEC Council from 1 to 4 April 2014. During the meeting, the Council noted the progress and achievements of SEAFDEC, and approved the proposed programme of activities to be undertaken by SEAFDEC in 2014.

MAY 2014 ▶ AVA hosted three ASEAN meetings – ASEAN Coordinating Centre for Animal Health and Zoonoses (ACCAHZ) Preparatory Committee (PrepCom); ASEAN Sectoral Working Group on Livestock (ASWGL); and ASEAN National Focal Points on Veterinary Products (ANFPVP) – in Singapore from 4 to 9 May 2014. Singapore served as the Chair country for the 22nd ASWGL and 1st ANFPVP meetings, and as the Vice-Chair country for the 8th ACCAHZ PrepCom Meeting.

On 23 May 2014, AVA received the Excellence in Public Service Awards – Best Practice Award (Inter-agency Collaboration) for our efforts in improving service delivery as a First Responder for animal-related feedback.

During the 82nd General Session of the World Assembly of Delegates of World Organisation for Animal Health (OIE) on 25-30 May 2014, AVA's Veterinary Public Health Centre (VPHC) was endorsed as Southeast Asia's first OIE Collaborating Centre for Food Safety, serving Asia and Oceania. Working closely with experts from OIE and other renowned institutions, AVA will be better enabled to keep abreast of emerging challenges in food safety, as well as new developments in food safety standards and regulations. OIE also recognised Singapore as free from Contagious Bovine Pleuropneumonia and Peste Des Petits Ruminants.

Head of Civil Service, Mr Peter Ong, and officers from the Public Service Division visited AVA's Veterinary Public Health Laboratory on 29 May 2014 to better understand AVA's work behind the scenes in ensuring food safety.

JUNE 2014 ▶ On 21-29 June 2014, Minister of State for National Development and Defence, Dr Mohamad Maliki Bin Osman, led a delegation to the Netherlands and Denmark to learn about their extensive use of technology and automation in farming and food production.

JULY 2014 ▶ During Food Safety Awards Night on 4 July 2014, Guest-of-Honour, Minister of State for National Development and Defence, Dr Mohamad Maliki Bin Osman, presented six Gold and 11 Silver awards, and 138 Certificates of Commendation to the food industry.

AUGUST 2014 ▶ In a review conducted on 4-7 August 2014, AVA's International Advisory Committee of Experts (IACE) found that AVA remains a trusted and well-respected organisation both in Singapore and internationally with food safety and bio-security standards that are of world-class standards. In addition, IACE commended our initiative in establishing the One Health platform with the Ministry of Health and National Environment Agency. AVA's progress in refining its contingency planning for disease incursions and using social media platforms to engage the public on a variety of food safety and animal health and welfare issues was also complimented by IACE.

On 7 August 2014, AVA received the Minister's Award (Team) for our project on 'Piloting First Responder Protocol on Animal-related Feedback'.

On 8 August 2014, AVA organised the inaugural One Health Symposium, which covered the One Health approach in bringing together public health, veterinary health, and environmental health professionals to ensure public health in Singapore.

On 14 August 2014, a group of Government Parliamentary Committee members visited AVA's Veterinary Public Health Centre, where they gained insights into AVA's robust food safety programmes and learned more about our new role as the OIE Collaborating Centre for Food Safety.

On 18-20 August 2014, Ms Tan Poh Hong, Chief Executive Officer of AVA, led the Singapore delegation to the 35th Special Senior Officials Meeting (SOM) of the ASEAN Ministers on Agriculture and Forestry (AMAF) and 13th Special SOM AMAF Plus Three (AMAF+3) held in Kota Kinabalu, Malaysia. Senior officials discussed the progress of various initiatives, such as the ASEAN Integrated Food Security Framework and Strategic Plan of Action on Food Security, ASEAN Plus Three Emergency Rice Reserve, and ASEAN Food Security Information System.

SEPTEMBER 2014

AVA's first rabies simulation exercise, which tested the operational feasibility, command, and control of AVA's rabies contingency plan, was successfully completed on 9 September 2014.

Minister of State for National Development and Defence Dr Mohamad Maliki Bin Osman led a Singapore delegation to the following ASEAN meetings in September 2014:

- 3rd APEC Food Security Ministerial Meeting (China, 19 September)
- 36th AMAF and 14th AMAF+3 meetings (Myanmar, 23-24 September)
- 4th ASEAN-China Ministerial Meeting on Quality Supervision, Inspection and Quarantine (Myanmar, 25 September)

AVA's Veterinary Public Health Laboratory (VPHL) gained recognition as the ASEAN Reference Laboratory for Environmental Contaminants. In this role, VPHL will provide training as well as technical advice and services to ASEAN member countries, in areas such as methods of analysis and sampling, and management of food safety.

OCTOBER 2014

Chief Executive Officer of AVA Ms Tan Poh Hong led a Singapore delegation to the 41st Session of the Committee on World Food Security in Italy from 13 to 18 October 2014.

A new Agriculture Productivity Fund (APF) was launched on 14 October 2014 with \$63 million set aside to support local farms in their capability development and drive towards higher productivity.

From 23 October to 5 November 2014, AVA partnered NTUC FairPrice in the "Made-in-Singapore" Fair to promote local food products and locally farmed produce. At the same time, AVA also launched the Good Aquaculture Practice for Fish Farming Certification Scheme, which is a benchmark for the production of safe and quality fish in Singapore.

A Food Defence table top exercise was successfully conducted on 29 October 2014 with participation from government agencies such as the NEA, MOH, Singapore Police Force, and Ministry of Home Affairs.

NOVEMBER 2014

AVA hosted the 10th Indonesia-Singapore Agri-business Working Group meeting on 26 November 2014 in Singapore, during which the progress of action plans to further improve the export volume of agri-products from Indonesia to Singapore was reviewed.

National Day Awards, comprising one Silver Public Administration Medal, two Bronze Public Administration Medals, two Commendation Medals, two Efficiency Medals, and one Long Service Medal, were awarded to eight AVA officers.

AVA replaced the eCLIPS system with a new eLicensing system, which allows customers to apply for multiple AVA licences, import and export permits, and certificates online.

DECEMBER 2014

The Food (Amendment) Regulations 2014 were gazetted on 15 December 2014, with changes in the areas of food additives, limit for mercury in predatory fish, as well as the use of phytosterols, phytosterol esters, phytosterols and phytosterol esters in food.

On 15 December 2014, AVA's headquarters relocated from the Ministry of National Development (MND) Complex at Maxwell Road to the JEM Office Tower in Jurong East. A new Service Centre, which consolidates services that were previously provided at AVA's headquarters at Maxwell Road and at the Centre for Animal Welfare and Control in Pasir Panjang, also commenced operations here.

JANUARY 2015

A Private Member's Bill was passed by Parliament to amend the Animals and Birds Act and give effect to some of the recommendations made by the Animal Welfare Legislation Review Committee. On 16 January 2015, amendments to the Animals and Birds Act were gazetted to strengthen the legislation on animal welfare matters.

An enhanced AVA website, launched on 20 January 2015, allows easy access to commonly queried topics relevant to visitors' needs. In addition, it was optimised to be reader-friendly on mobile devices.

On 31 January 2015 AVA organised an adoption drive that featured about 100 animals from 10 animal welfare groups. With Cat Welfare Society as the main partner of the event, we also set the Singapore Book of Records for the Largest Gathering of People with Cat Faces.





FOOD SUPPLY RESILIENCE



In Singapore, we can always enjoy a wide variety of safe food. AVA plays a significant role in feeding the nation, from diversifying overseas sources of food supply and facilitating imports, to supporting local farms.



FOOD SUPPLY RESILIENCE

Enhancing the Resilience of Singapore's Food Supply

To ensure a resilient supply of safe food for Singapore, AVA has in place strategies and programmes to maintain an adequate and stable supply of food, while mitigating food safety risks. AVA adopts a diversification strategy to facilitate a steady flow of a wide variety of safe food into Singapore. While strategically diversifying our overseas food supply, we also seek to enhance local food production through research and capability development. Additionally, AVA continues to educate consumers on the use of liquid eggs, egg powder, and frozen meat as viable alternatives to shell eggs and chilled meat. To complement the efforts of local farms in increasing productivity, we also encourage consumers to choose local produce and support our farmers. /



A mechanised vaccination bath for fingerlings used in a fish farm in the Netherlands.

SOURCE DIVERSIFICATION

Singapore imports more than 90 percent of her food. To enhance supply resilience, AVA partners the private sector in food sourcing and encourages the industry to explore alternative overseas supplies through sourcing trips. By buying from many different sources, Singapore is better buffered against potential food shortages and price volatility. AVA continues

to engage key stakeholders to enhance source diversification. As part of this engagement, business cluster meetings, as well as CEO's dialogues with associations, supermarket retailers, and importers are held. Issues on food supply challenges, potential new sources, consumer trends, and the plans in place to mitigate any supply disruption are discussed at these industry engagements.



At a vegetable farm in the Netherlands, seeding, irrigation, and fertigation are done automatically, resulting in manpower savings and higher efficiency.

FOOD SOURCING MISSIONS AND STUDY TRIPS

In FY 2014, AVA continued to scout for new sources of safe and quality food for Singapore. Food sourcing missions and study trips were conducted to explore new sources and strengthen existing trading ties.

On 21-29 June 2014, Minister of State for National Development and Defence, Dr Mohamad Maliki Bin Osman, led a delegation of representatives from the Ministry of National Development (MND), AVA, as well as local food fish and vegetable farms to the Netherlands and Denmark. There, delegates gained insights into the extensive use of technology and automation to ensure a seamless production flow with minimum labour. They also learned about the support that the agri-food sector receives from knowledge institutes, in terms of agri-food research and development.

Learning points gathered from the trip were shared with our food fish farmers during a workshop on 19 September 2014.

On 21-25 July 2014, International Enterprises (IE) Singapore led representatives from AVA and three local companies on a sourcing mission to Myanmar. With aims to source for fruits and vegetables, the delegation explored potential collaboration and investment opportunities with suppliers there.

Highlights of the mission trip included visits to a logistics company; the Myanmar Fruit, Flower & Vegetable Producer & Exporter Association; the Department of Trade Promotion; fruits and vegetables farms; and the Taunggyi wholesale market in Heho (Shan State). The trip resulted in meaningful exchanges of information with middlemen who could potentially coordinate the exports of fruits and vegetables to Singapore. The delegation gained a better understanding of northern Myanmar as a source of vegetables and fruits.





In a hi-tech warehouse in Belgium, single cartons are automatically picked and buffered before they are packed into a mixed pallet.



A fair held in a supermarket to promote Indonesian produce.

AVA officers participated in a study trip to Belgium, Germany, and Switzerland on 11-16 January 2015. Organised by JTC Corporation, the objective was to learn about the latest technology and standards related to cold storage and distribution of food. The delegation visited four food warehouses and gained insights into the various automated pallet conveying and case picking systems used there. These insights would enable us to provide informed advice and useful best practice tips to local food companies that intend to build or improve their cold store facilities.

PROMOTING SUPPLY FROM INDONESIA

The Indonesia-Singapore Agri-business Working Group (AWG) was formed in June 2010 to increase bilateral trade in vegetables, fruits, seafood, and ornamental fish. AVA hosted the 10th Indonesia-Singapore AWG Meeting on 26 November 2014 in Singapore, during which the progress of action plans to further improve the export volume of agri-products from Indonesia to Singapore was reviewed.

AVA also worked with relevant stakeholders, such as trade associations, retailers, and the Embassy of Indonesia, to organise two fairs to promote Indonesian agri-products. These fairs were held in September and October 2014 at NTUC FairPrice and Giant supermarkets. Indonesian produce was also promoted at the Food&HotelAsia 2014.



AVA CEO Ms Tan Poh Hong (front, 7th from left) and the Singapore delegation at a sweet potato farm and processing facility in Bandung, Indonesia.

AVA also continued to provide Indonesian farmers with technical assistance in vegetable production and post-harvest handling, with the aim to raise productivity and export of vegetables from Indonesia. During a site visit in Bandung, the Singapore delegation of AVA officers and vegetable traders shared good agricultural practices with local farmers, particularly on the production, post-harvest handling, and packing of sweet potatoes.

LOCAL PRODUCTION

Besides diversifying our overseas food sources to ensure our food supply resilience, AVA also works closely with local farms to enhance local food production to minimise the impact of supply disruptions.

AVA FOOD FUND

In December 2009, AVA introduced the first tranche of Food Fund to support food diversification efforts and local farm capability development to enhance productivity. Subsequently, two more tranches were launched in August 2011 and October 2013.

A total of \$29.69 million were committed to 234 approved projects under the Food Fund scheme. As at 31 December 2014, 156 projects were closed, with a total of \$12.39 million disbursed.

AGRICULTURE PRODUCTIVITY FUND

A new Agriculture Productivity Fund (APF) was launched on 14 October 2014 with \$63 million set aside to support local farms in their capability development and drive towards higher productivity. Funding support consists of three categories:

Category	Funding Support for
Basic Capability Upgrading (BCU)	Equipment that would help increase productivity
Productivity Enhancement (PE)	Automation systems or advanced/hi-tech integrated systems to achieve quantum leaps in productivity
Research & Development (R&D)	<ul style="list-style-type: none"> • Projects on intensive farming technology • Consultancy services in: <ul style="list-style-type: none"> » Land intensification » System prototyping » Pilot trials of farm technological systems

APF replaces the Food Fund and provides greater support in the following ways:

- It is made available to all farms (food and non-food) within the agriculture sector to help them increase their productivity and meet minimum productivity levels.
- Higher funding quantum for BCU and PE categories. This provides adequate support for farms to adopt systems and equipment with maximum impact on productivity.
- It is available for a period of five years, with no fixed window period for application. This allows farms to apply for funding at any time. Farms can also tap into the different funding categories, subject to a maximum of three applications each for the BCU and PE categories.



Minister of State for National Development and Defence Dr Mohamad Maliki Bin Osman, (centre) and AVA CEO Ms Tan Poh Hong (right) visited one of the local fish farms affected by plankton bloom in February 2015.

ASSISTANCE TO COASTAL FISH FARMS AFFECTED BY PLANKTON BLOOM

In February 2014, many fish farmers at the East and West Johor Straits saw large fish stocks perish due to bad weather and water conditions. To help farmers resume their operations, an assistance scheme was introduced to provide funding support for the re-stocking of fish fry. The scheme closed on 28 February 2015 with about \$1 million committed to 59 farms that applied for assistance.



Farms that took early precautions such as using canvas-lined net-cages were able to salvage most of the farm's stock when plankton bloom occurred.

In addition, 62 coastal fish farms tapped on the Food Fund's Special Basic Farm Capability Upgrading scheme to purchase equipment to minimise recurrence of fish kills due to low levels of dissolved oxygen. About \$1.3 million was awarded to 76 projects under this scheme.

In late February 2015, many local fish farms along the East Johor Straits were affected by a plankton bloom. Farms that took early precautions were able to significantly minimise losses.

Moving forward, AVA will help farmers develop feasible contingency plans that will effectively provide protection against such environmental impacts. Farmers can also tap on APF to purchase relevant equipment to enhance their resilience.

In addition, AVA is collaborating with the Tropical Marine Science Institute of National University of Singapore to research on plankton blooms, to enable development of effective mitigating solutions. These studies are ongoing.

AVA also called for proposals for the design and development of a closed-containment aquaculture system for coastal fish farming in 2014. Five companies are currently working on systems that will primarily minimise exposure to environmental changes, such as plankton bloom.

FACILITATING FOOD IMPORTS

AVA adopts a risk-based approach in managing the delicate balance between ensuring a stable supply of safe food on one hand, while mitigating food safety risks on the other. This enables us to facilitate food imports without compromising food safety.

ESTABLISHMENT OF DISEASE-FREE-ZONE

On 21 May 2010, AVA signed an agreement with the Jilin City government to establish and maintain a Foot and Mouth Disease-Free-Zone (DFZ) in Yongji County, Jilin Province, China. The establishment of the DFZ is part of AVA's regionalisation approach, to allow imports from DFZs within countries that are unable to declare freedom from disease, subject to these imports meeting AVA's conditions for disease control and surveillance.

With the establishment of this DFZ, Jilin will become a potential source of pork for Singapore. The DFZ supports Singapore's commercial companies' joint venture to develop an integrated pig farm to supply pork to Singapore. China's Ministry of Agriculture (MOA) officially recognised the DFZ status on 2 August 2012 with subsequent endorsement by AVA. Following that, AVA participated in annual audits of the Jilin DFZ with MOA in 2013 and 2014. Yearly audits are necessary to ensure the integrity and maintenance of the DFZ. AVA and the Chinese authorities will continue to collaborate in the maintenance of the DFZ.

IMPORT RISK ASSESSMENTS

Through sound risk management, AVA has enabled the approval of food imports from new sources.

In 2010, Sarawak, East Malaysia was assessed to be a possible new source of pork for Singapore. AVA conducted a thorough evaluation, as well as an assessment of the state's animal and veterinary public health programmes. In addition, inspections were conducted at the pig farming area and abattoir in Sarawak to ensure their bio-security control measures and hygiene standards met our requirements. During the inspections, AVA officers pointed out areas for improvement that the abattoir subsequently rectified.

The abattoir has been approved to export frozen pork to Singapore, subject to our import and veterinary conditions. In February 2015, the first consignment of frozen pork from Sarawak was imported.

PILOT PROGRAMMES FOR IMPORTED MEAT

To facilitate trade and improve the efficiency of AVA's import procedures, our programmes are constantly reviewed in consultation with our stakeholders. During the FY, two pilot programmes for imported meat were assessed to be effective in bringing about mutual benefits for AVA and the trade.



An AVA officer (left) assessing the layout of the Sarawak abattoir and Pig Farming Area.

Inspection of Chilled Pork

Previously, all chilled pork consignments were subject to a detain-and-inspect procedure before they could be released for sale. A batch of chilled pork produced by an establishment in Australia could be shipped as different consignments for various Singapore importers. In this case, this batch would have gone through multiple inspections by consignment.

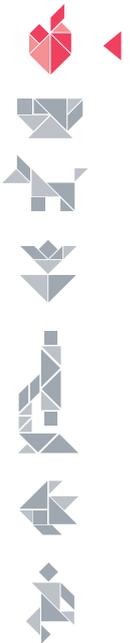
An establishment with consistently high compliance rate was selected for the pilot programme, under which only one consignment from the same batch of chilled pork will be inspected per day.

Compliance rates from the establishment remained high, and importers were able to process and deliver their consignments quickly. The successful pilot will be extended to include more chilled pork establishments.

Sampling of Chilled Pork and Frozen Chickens

Previously, meat products from every establishment were sampled for routine laboratory testing based on import volume. This had led to over-sampling of establishments with high volumes of export and under-sampling of establishments with low volumes of export.

AVA implemented a pilot programme for chilled pork from Australia and frozen chickens from Brazil, where every establishment is sampled once in three months. This resulted in better sampling coverage regardless of the establishment's export volume. The time taken for consignments to reach retail or foodservice markets was shortened, without compromising food safety. The successful pilot will be extended to cover other types of products.



RETAIL LABELLING SEMINAR

All pre-packed food products for sale in Singapore must be labelled according to the general labelling requirements of the Singapore Food Regulations.

AVA conducted an inaugural retail labelling seminar on 11 August 2014 to provide the industry with greater clarity on AVA's retail labelling requirements. Topics such as the guidelines on retail labelling and procedures for import permit declaration were covered. The seminar was attended by 114 industry representatives from 53 companies.

STAYING ALERT AGAINST EMERGING THREATS & ISSUES

AVA's horizon scanning function scans and analyses the global food supply situation on a regular basis to help AVA discover opportunities and potential threats that could impact our food supply. Emphasis is placed on global food supply and price changes, as well as possible production limitations. Key factors that drive global food supply and demand are analysed to assess their impact on Singapore's food supply situation. This process is complemented with feedback from the industry.

In addition, we identify and monitor trends of global food supply and demand which could unfold in the longer term. These global perspectives are useful in AVA's strategic planning so as to enhance the organisation's preparedness and awareness of potential challenges in the future, as we develop our programmes and policies.

RAISING CONSUMER AWARENESS OF ALTERNATIVE FOOD PRODUCTS AND LOCAL PRODUCE

To enhance food supply resilience, AVA continues to educate consumers on food alternatives such as frozen meat, egg powder, and liquid egg, which can help to buffer against potential supply disruptions. We also reach out to the public and encourage consumers to support local produce.

FOOD EXPOS

As part of AVA's public outreach initiatives to raise awareness of food alternatives and local produce, AVA participated in the Singapore Food Expo 2014 from 29 May to 2 June 2014 and the Asia Pacific Food Expo from 21 to 25 November 2014. A chef was invited to conduct cooking demonstrations of dishes using food alternatives (frozen meat and liquid egg) and local produce (fish, vegetables, and eggs). Visitors were educated and quizzed on the benefits of choosing local produce and frozen meat during the cooking demonstrations. Over 10,000 people visited AVA's booth at each of these events.

TASKFORCE FOR PROMOTION OF LOCAL PRODUCE

In January 2015, a Promotion of Local Produce Taskforce was set up as a platform to facilitate collaboration among AVA and key stakeholders from the retail sector, industry associations, and local farms. The taskforce will look into formulating strategies as well as implementing public education and outreach activities to create greater awareness of key local produce items such as egg, fish, and vegetable.

NTUC FAIRPRICE "MADE-IN-SINGAPORE" FAIR

AVA continued to encourage support for local produce and raise awareness of AVA's quality assurance schemes by collaborating with NTUC FairPrice in the annual "Made-in-Singapore" Fair. A series of cooking demonstrations using local produce as main ingredients were organised, and recipes specially created by Celebrity Chef Violet Oon were distributed to shoppers.

In addition, in-store publicity materials, print advertisements in newspapers, and collaterals served to increase awareness of the campaign and spread messages on local produce.



AVA partnered with NTUC FairPrice in its "Made-in-Singapore" Fair from 23 October to 5 November 2014.

GOOD AQUACULTURE PRACTICE FOR FISH AND VEGETABLE FARMING

In conjunction with the "Made-in-Singapore" Fair, AVA also launched the Good Aquaculture Practice for Fish Farming (GAP-FF) Certification Scheme. The GAP-FF is a set of guidelines to help local fish farms improve in key areas such as farm infrastructure management, farm husbandry, fish health management, and farm environment management. The aim is to raise awareness of local fish farms among consumers, as well as to provide assurance to both retailers and consumers by setting the benchmark for the production of safe and quality fish. There are currently three GAP-FF certified farms in Singapore.



To redeem a complimentary serving of the specially created dishes, visitors took a photo of themselves with the food truck and uploaded the photo to Facebook or Instagram.

Local vegetable farms are encouraged to adopt the Good Agricultural Practice standard, under the voluntary Good Agricultural Practice for Vegetable Farming (GAP-VF) Certification Scheme. In FY 2014, AVA audited and approved eight vegetable farms for GAP-VF certification renewal.

professionals were keen to find out where they can purchase local produce and how to identify them. The roadshows reached out to over 5,000 visitors.



GAP-VF certified farms can brand their produce with this logo.



Among other dishes, the food truck also served tasty Egg Benedict made using local eggs.

SCHOOL AND WORKPLACE ROADSHOWS

In January 2015, AVA collaborated with students from the Nanyang Technological University (NTU) on their “We are Singavore” campaign to promote local produce. With the tagline “Be a Singavore, support local by eating local”, the aim was to create a culture of consuming home-grown produce.

COOKING CLASSES AND FARM TOURS

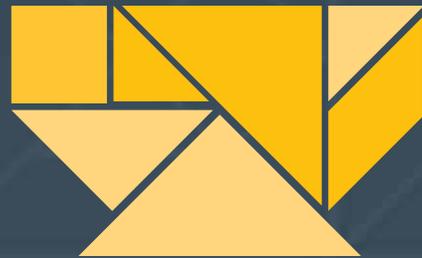
To raise awareness of the types of locally farmed vegetables, fish and eggs available, AVA collaborated with the People’s Association in their ‘Taste 50’ culinary workshops and signature cooking events to incorporate local produce in their dishes.

A food truck was deployed to campuses at the National University of Singapore, NTU, and Singapore Management University to distribute 600 food samples made using locally farmed eggs, fish, and vegetables. Following this, the food truck was also deployed to roadshows at Harbourfront Centre, Mapletree Business City, and the URA Centre. Many working

To enable consumers to learn more about our local farms, the People’s Association also publicised tours to local vegetable and dairy farms through its community centre network. On average, the farms hosted an average of five to 10 visits per month.



FOOD SAFETY



All food lovers want to be able to enjoy their food with peace of mind. As the national food safety authority, AVA ensures that food along the supply chain is safe. We also educate the public on food safety practices that they can adopt. Together, we can keep food safe.





FOOD SAFETY

Keeping Food Safe for Consumption

Singapore imports more than 90 percent of its food. To ensure all locally produced and imported food products are safe for consumption, AVA adopts a science-based risk management approach that is based on international standards. AVA sets and enforces food safety standards for all food entering the Singapore market, from production to just before retail. As food safety is a shared responsibility, AVA also engages the industry and public to do their part in keeping food safe for consumption.

To safeguard public health, AVA has in place food safety standards that are in line with international ones, and robust monitoring, surveillance, and enforcement programmes to ensure that these standards are maintained. We closely monitor each stage of the food production chain – from the conditions at farms, slaughterhouses, and food processing establishments, to testing of food samples at the point of import or at local establishments.

REGULATING FOOD IMPORTS

ACCREDITATION OF SOURCES

In FY 2014, new approvals were granted for the import of meat and poultry products from three countries, namely East Malaysia – Sarawak (frozen pork); Japan (frozen bovine offal); and France (chilled fatty goose and duck liver). The approvals were based on the assessment of the exporting countries' veterinary services, legislation, animal disease status and control measures, national residue and microbiological monitoring programmes, as well as the regulatory system for export of meat and poultry products to Singapore.

Meat and Egg Processing Establishments

As at 31 March 2015, 36 countries were approved by AVA for export of meat, processed meat, processed egg, canned meat, and table hen eggs to Singapore.

Inspection visits to China and Thailand were carried out to inspect and accredit their establishments for export of meat and processed meat products to Singapore.

In FY 2014, AVA accredited 86 new establishments from 19 AVA-approved countries for export of frozen pork, chicken, beef, and offal, as well as processed egg, chicken and pork products to Singapore.

Poultry and Pig Farms

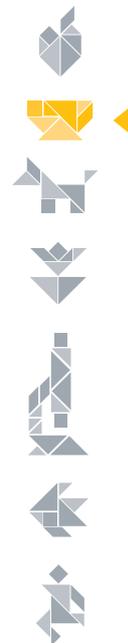
By the end of the FY, AVA accredited 235 overseas poultry and pig farms for the export of poultry, shell eggs and pigs to Singapore. The accredited farms comprised 131 chicken broiler farms and 56 duck broiler farms in Malaysia; a pig farm in Indonesia; and 47 layer farms from seven countries.

ENHANCEMENTS IN IMPORT REQUIREMENTS

In line with our objective of securing food safety at source, AVA reviewed its import requirements for minimally processed coconut and coconut products from Malaysia. From 1 May 2014, minimally processed coconuts and coconut products imported from Malaysia must be obtained from producers that are certified by Malaysia's Ministry of Health. The certification is in accordance with the food safety assurance guidelines jointly developed by Singapore and Malaysia.

SUSPENSION AND RESUMPTION OF SUPPLY SOURCES

AVA suspends food import from sources that pose significant hazards, and reinstates them after they have rectified the hazards. In FY 2014, a total of 21 overseas poultry farms were suspended for failing to meet our food safety standards. The farms were



suspended due to the detection of *Salmonella Enteritidis* (SE) and drug residues, as well as major non-compliance with import conditions.

Following the World Organisation of Animal Health (OIE)'s recognition of the Netherlands and USA's 'negligible risk' statuses for Bovine Spongiform Encephalopathy (BSE), AVA lifted its suspension of the import of bone-in beef cuts from both countries. In addition, AVA also lifted its import suspension of bovine offal and processed beef from the USA, as well as bovine offal from Japan.

ISSUANCE OF LICENCES AND PERMITS

Meat and Seafood

As at the end of FY 2014, there were a total of 2,625 licensed traders for meat and seafood, to whom 21,775 meat permits and 196,383 seafood permits were issued.

Fruits, Vegetables, and Processed Food

There were a total of 1,062 licensed importers for fresh fruits and vegetables, to whom 239,060 permits were issued in FY 2014. In addition, there were a total of 9,499 registered importers for processed food, to whom 403,049 permits were issued.

SURVEILLANCE AND MONITORING

AVA has comprehensive surveillance programmes in place to monitor food safety hazards in primary produce and processed food. Import consignments are subjected to systematic inspections and laboratory testing for pathogens as well as chemical contaminants and residues.

Meat and Meat Products

During the FY, AVA inspected 71,819 meat consignments with a total weight of 287,121 metric tonnes valued at \$1.27 billion. We continued with the surveillance of *Listeria monocytogenes* in ready-

to-eat products, and *Escherichia coli* (*E. coli*) O157 in processed beef products and manufacturing cuts (such as beef trimmings). A total of 3,310 samples were tested for *Listeria monocytogenes* and nine consignments were rejected due to contamination with *Listeria monocytogenes*. A total of 2,786 samples were also tested for *E. coli* O157. No consignment was detected with *E. coli* O157.

Overall, a total of 117 consignments (0.16%) were rejected, mainly for *Salmonella* and high *E. coli* count. All the rejected consignments were either returned to the country of origin or destroyed.

Seafood and Seafood Products

AVA inspected 2,399 consignments of seafood with a total weight of 3,569 metric tonnes valued at \$52.1 million. A total of 13 consignments (0.54%) were rejected due to microbial and chemical contamination.

For the inspection of seafood, the focus continues to be on high-risk products, i.e. cooked and pasteurised crabmeat; cooked prawns; oysters; and smoked seafood. These consignments are detained upon arrival for inspection and laboratory testing. Their respective accompanying health certificates from the countries of origin are also checked.

During the FY, we continued to monitor imported fresh seafood at our fishery ports for adulteration with chemical preservatives (i.e. formaldehyde and boric acid). A total of 416 samples were tested and five samples (1.2%) were found to contain high levels of formaldehyde. The importers of these consignments were fined for the violations and their subsequent consignments were monitored under hold-and-test inspection before being released for sale.

In addition, 56 samples of farmed seafood were tested for malachite green and antibiotics residues. All results were satisfactory.



An AVA officer inspecting a consignment of imported meat.



An AVA officer (right) collecting samples of imported vegetables for laboratory testing.

Egg Products

AVA inspected 854 consignments of processed egg products – comprising liquid eggs, powdered eggs, cooked eggs, as well as preserved and salted duck eggs – with a total weight of 5,774 metric tonnes valued at \$19.1 million. A total of seven consignments were rejected:

- Four salted duck egg consignments due to the presence of Sudan dye.
- One salted duck egg consignment due to off-odour.
- One cooked chicken egg consignment due to the presence of *salmonella*.
- One liquid egg consignment due to the presence of coccidiostats.

All the rejected consignments were either returned to the country of origin or destroyed.



An AVA officer inspecting imported eggs at Tuas Checkpoint.

Fruits and Vegetables

AVA continued its inspection of imported fresh fruits and vegetables throughout FY 2014. In total, 7,202 consignments of fresh fruits and vegetables from 31 countries were inspected for pesticide residues, radioactivity, preservatives, toxic chemicals, and microbial contaminations. The overall violation rate from samples of hold-and-test and routine inspections was 7.48 percent. Of these, 244 consignments under the hold-and-test programme were rejected. We worked closely with our counterparts in other countries to provide effective remedial actions on pesticide residue violations.

Processed Products

In FY 2014, a total of 4,578 consignments of imported processed food were inspected and sampled for laboratory analyses. Of these, 112 consignments were rejected due to the presence of non-permitted food additives, excessive additives, and contaminants.

In addition, 3,091 inspections were conducted on 40,431 food items from retail outlets, and 5,026 food samples were taken for chemical, microbiological, and physical analyses. Of these, 402 samples were rejected due to the presence of non-permitted food additives, excessive additives, and contaminants, as well as labelling infringements.

A total of 159 summonses/compound fines, 857 written warnings, and 193 advisories were issued for non-compliances with the Food Regulations during the FY. We investigated 132 complaints on food importers and took appropriate enforcement actions where irregularities were detected. Some of these cases involved labelling infringements and food contamination with foreign matter.



Surveillance at a coastal fish farm in Singapore.

REGULATING LOCAL FOOD PRODUCTION

FARMS

As at end of FY 2014, there were 117 licensed coastal fish culture farms, five poultry farms, 54 vegetable farms, and nine land-based food fish farms.

Local chicken and quail egg farms continue to be monitored monthly for drug residues and SE in FY 2014. SE was detected at two local poultry farms, which were then issued with isolation orders. Eggs from these flocks were sent to an AVA-approved liquid-egg processing plant, before being released for human consumption. Isolation orders were subsequently lifted after negative detections of SE were achieved in the tests.



Surveillance of *Salmonella Enteritidis* at a local poultry farm.

Market-sized food fish from local coastal farms are tested regularly for drug residues, heavy metals, chemical contaminants, and microbiological pathogens. During the FY, the sale of fish from one local coastal fish farm was suspended following detections of malachite green. The suspension order was lifted after all the fish from the affected net cages died due to the plankton bloom in February 2015.

During this plankton bloom, large stocks of fish in local coastal fish farms also perished. To ensure that fish harvested from waters in the same area were safe for consumption, post-mortem examinations, as well as laboratory testing for biotoxins and microbial of fish samples tests, were conducted. No biotoxin related to food safety was detected.

Local oyster farms continue to be monitored weekly for Norovirus and Hepatitis A, as well as monthly for heavy metals, toxins, and microbiological pathogens. The sale of oysters from one farm was suspended in April 2014 and January 2015 after repeated detections of *Vibrio alginolyticus*. The suspension was subsequently lifted after two consecutive negative samplings.

Animal feed used by all food-producing farm animals are regularly tested for antibiotic residues, chemical contaminants, melamine, and microbiological pathogens. During the FY, trace amounts of antibiotics were detected in feed samples collected from coastal fish farms. Our investigations showed that these feed were imported and the overseas manufacturer was the source of the contamination. End-product testing of fish was carried out and antibiotic residues were not detected in fish.





An AVA inspector (left) collecting a sample of slaughtered chicken at a local slaughterhouse.

LOCAL FOOD ESTABLISHMENTS

At the end of FY 2014, there were 1,547 local food processing establishments licensed by AVA. These establishments included slaughterhouses, as well as cold stores for meat and fish products.

During FY 2014, AVA received 231 licence applications and issued 174 licences. A total of 939 site inspections were carried out at food processing establishments to evaluate the new licence applications; changes in layout for existing premises; and suitability of the location for setting up food establishments.

AVA conducts annual on-site audit assessments on AVA-licensed local food establishments to determine their grading status, and provides on-site advice to help them improve and upgrade their premises. In FY 2014, a total of 1,762 audit inspections were carried out on these local food establishments. As at 31 March 2015, there were 178 local food processing establishments that were awarded with the A grade, 698 with the B grade, 464 with the C grade, and 41 with the D grade, under AVA's Food Factory Grading Scheme. The remaining 166 new food establishments were not due for grading. A total of 518 (33.48%) of all establishments obtained Hazard Analysis and Critical Control Points (HACCP) certification.

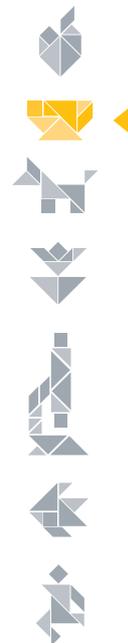
Abattoir and Slaughterhouses

As at 31 March 2015, there were 10 chicken and four duck slaughterhouses, as well as one pig abattoir, in Singapore. A total of 46.5 million chickens, 6.1 million ducks, and 341,154 pigs were slaughtered at these premises. All pigs slaughtered at the abattoir were inspected by AVA, of which 565 pigs (0.17% of total pigs slaughtered) and 202,416 organs (3.5% of the total number of organs) were condemned as unfit for human consumption.

Enforcement actions are taken against poultry slaughterhouse operators and pork cutting establishments that fail to comply with AVA's licensing conditions. In FY 2014, a total of 20 warning letters were issued and 16 composition fines were imposed for hygiene infringements and cold chain violations.

Food Processing Establishments

AVA regularly inspects local food establishments to ensure that proper food hygiene practices are maintained. In FY 2014, AVA made 6,504 inspection visits to food establishments that were involved in manufacturing meat, fish, egg, and other processed foods, as well as cold stores.



A total of 1,172 processed food samples were taken for laboratory analyses. Of these, 19 were found to be unsatisfactory and two were found to be unfit for human consumption. A total of 57 summonses/compound fines and 563 written warnings were issued for non-compliance with the Sale of Food Act and the Wholesome Meat and Fish Act.

We investigated a total of 287 complaints on unwholesome and improperly labelled pre-packed processed food, and took enforcement actions against contraventions in hygiene practices and other offences.

REGISTRATION AND INSPECTION OF FOOD STORAGE WAREHOUSES

Food storage warehouses must be registered with AVA to facilitate food traceability. This registry enables AVA to promptly notify warehouses should there be a need for immediate recall of food products.

As at 31 March 2015, a total of 1,106 food storage warehouse applications were received, and registration for 1,027 warehouses was completed. In addition, 132 site assessments were carried out on new warehouses to assess the suitability of the warehouses to be used for storage of food.

All registered food storage warehouses are subjected to inspections by AVA. We conducted 912 inspections on the warehouses and advised operators on Good Warehousing Practices for the maintenance and improvement of warehouse hygiene and operations.

SPECIAL PERMITS FOR RELIGIOUS INSTITUTIONS

In FY 2014, a total of 46 permits were issued to religious bodies and institutions to slaughter 12 goats and 3,897 sheep for religious purposes. Inspections were carried out upon arrival of the animals, in

holding pens, as well as in slaughter and skinning/meat processing areas, to ensure animal welfare and maintenance of food hygiene standards.

In addition to Australia, countries such as the USA, Canada, Ireland, France, and Japan were approved in 2014 to export sheep and goats for religious slaughter. These new approvals allowed us to further diversify sources.

In the lead up to *Korban* 2014, AVA collaborated with Meat & Livestock Australia to conduct technical seminars and practical sessions on good animal handling techniques for key personnel. Briefings were also conducted for AVA inspectors, the Approved *Korban* Vendor (AKV), and inspectors from the Islamic Religious Council of Singapore (Majlis Ugama Islam Singapura or MUIS). AVA actively collaborated with MUIS, Malay-Muslim organisations, and the AKV to ensure that *Korban* preparations were on track.

To ensure continued compliance with animal welfare standards and Australia's Export Supply Chain Assurance System (ESCAS) requirements, all 26 AVA-approved venues for religious slaughter were assessed during the FY. Of these, 15 venues that conducted *Korban* rites using Australian sheep were assessed to have met Australia's ESCAS requirements. Independent auditors also found these premises to be compliant with ESCAS standards.

The remaining 11 AVA-approved venues used Irish lambs for their ritual slaughter. Although these venues were not subjected to ESCAS audit, the same standard operating procedures for *Korban* operations and inspections were adopted. This ensured that treatment of animals used in *Korban* were in accordance with the OIE's animal welfare standards, and that food hygiene standards were fully observed.



An AVA officer (right) conducting training on animal handling at a mosque.



Dioxin analysis conducted in VPHL's contaminants section.

LABORATORY CAPABILITIES

Up-to-date and efficient laboratory testing capabilities at AVA's Veterinary Public Health Laboratory (VPHL) are the cornerstone of AVA's food safety monitoring and surveillance programme. VPHL boasts a comprehensive suite of diagnostic tests to rapidly detect a wide range of known risks and unanticipated food-borne hazards.

In FY 2014, VPHL carried out approximately 1.8 million analytical tests on 51,932 samples of imported and locally-produced food products. These included tests for pathogens; antibiotics; growth promotants; hormones; pesticide residues; chemical additives; and contaminants, which are detrimental to public health.



In FY 2014, VPHL carried out approximately 1.8 million analytical tests on 51,932 samples of imported and locally-produced food products.

In addition to tests done as part of AVA's food safety programme, VPHL serves the local food industry, as well as other government agencies and statutory boards. VPHL also extends its commercial testing services to other countries upon request.

VPHL ensures that its tests are accredited according to international standards. The laboratory maintained its accreditation by the Singapore Accreditation Council-Singapore Laboratory Accreditation Scheme (SAC-SINGLAS) and has been ISO/IEC 17025 certified since 2000. With 14 new methods accredited by SAC-SINGLAS in FY 2014, the total number of accredited methods now stands at 240. VPHL will continue to develop and accredit new test methods to enhance food safety testing.

VPHL benchmarks its testing capabilities by participating in several inter-laboratory proficiency testing programmes. We continued to perform well in these programmes.

AVA's track record and excellence in food safety continued to gain international recognition. During the FY, the World Organisation for Animal Health (OIE) endorsed the Veterinary Public Health Centre (VPHC) as Southeast Asia's first OIE Collaborating Centre for Food Safety, serving Asia and Oceania. As an OIE Collaborating Centre for Food Safety, VPHC will be working closely with experts from OIE and other renowned institutions. This will better enable AVA to keep abreast of emerging challenges in food safety, as well as new developments in food safety standards and regulations.



AVA is building up laboratory capabilities on Isotope Ratio Mass Spectrometry.

In September 2014, VPHL also gained recognition as the ASEAN Reference Laboratory for Environmental Contaminants. This recognition enables us to provide training as well as technical advice and services to ASEAN member countries, in areas such as methods of analysis and sampling, and management of food safety.

ENHANCING TESTING CAPABILITIES

VPHL embarks on relevant R&D to stay competent and vigilant against an ever-increasing list of contaminants and emerging pathogens. In FY 2014, methods for food safety testing were developed or enhanced in the areas of chemical contaminants, drug residues, pesticide residues, food components, food additives, microbiology, food quality and authentication, food borne toxins, and genetically modified materials.

Food Traceability

Singapore relies heavily on imports to meet our demand for food. At present, the tracing of the origin of imported food is dependent on the declaration or documentation that accompanies the imported consignment. To verify the authenticity of the declaration, relevant laboratory capabilities are required.

AVA is currently participating in two projects with the International Atomic Energy Agency to build up our laboratory capability on food traceability techniques for rice and milk, using Isotope Ratio Mass Spectrometry, Inductively-coupled Plasma Mass Spectrometry, and Inductively-coupled Plasma Atomic Emission Spectrometry.

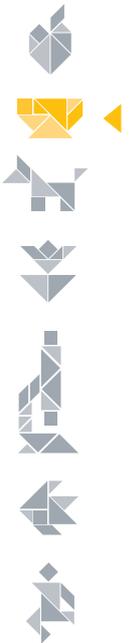
Detection of Nano-materials

In FY 2013, VPHL began establishing laboratory capabilities for the detection, risk characterisation, and monitoring of nano-particles in food. Renovation and retrofitting work for a nano-material laboratory space was completed in FY 2014, and work is underway to set up the capability to test for nano-particles in food by leveraging the use of the Inductively Coupled Plasma / Mass Spectrometry with the Asymmetric Flow Field Flow Fractionation (ICPMS AF4). A two-year collaborative research study on 'Silver, titanium dioxide, and silica nano-particles in various food matrices' was also established with the School of Material Science and Engineering at the Nanyang Technological University (NTU).

STAYING ALERT AGAINST EMERGING THREATS & ISSUES

AVA scans open information sources to detect overseas reports on food safety incidents, food recalls, as well as industry practices or new food technology, which can lead to unsafe food.

Horizon scanning supports AVA's food safety surveillance programmes by providing early alerts on incidents that impact the safety of food in Singapore, so that mitigation measures can be implemented promptly. During the FY, our scanning efforts alerted us to the discovery of food products in Chinese Taipei, which were contaminated with tainted cooking oil (wherein "gutter oil" was used as cooking oil during food production). Our vigilance enabled AVA to take early and quick actions to mitigate the risks.





14th Meeting of the ASEAN Task Force on Codex.

CODEX ALIMENTARIUS COMMISSION

To stay abreast of food safety developments in the international arena, AVA participated in Codex Alimentarius Commission meetings during the FY. Topics such as food additives, food contaminants, pesticide residues, food labelling, nutrition and foods for special dietary uses, animal feeding and food, and import and export certification systems were discussed.

The 14th Meeting of the ASEAN Task Force on Codex (ATFC) was held on 3 – 5 June 2014 in Singapore, and was attended by 29 delegates from ASEAN countries. ATFC provides a forum for ASEAN to discuss and coordinate the region's positions for agenda items that will be discussed at Codex Committees and Codex Alimentarius Commission meetings.

At the 37th Session of the Codex Alimentarius Commission in July 2014, 28 new and revised Codex standards or related texts, as well as many new or revised provisions for additives and Maximum Residue Limits for pesticides, were adopted for country reference.

RISK AND SAFETY ASSESSMENTS

AVA has in place a system to assess the risks posed by various food items and to manage food safety incidents. AVA will implement appropriate risk-mitigating measures, in accordance to the risk that the food items pose. As part of risk assessment, AVA also conducts surveillance of food products and food contact materials that are available in Singapore.

FOOD CHEMICALS AND FOOD CONTACT MATERIALS

AVA conducts risk assessments on the dietary exposures to food chemicals in our daily food intake. Our assessment of polycyclic aromatic hydrocarbons (in processed food) and total mercury (in processed food other than fish and shellfish) showed that the current levels of these chemicals do not pose a health risk to the general population in Singapore.

AVA also conducts safety assessments on food-contact materials and articles to ensure that they are safe for food contact applications. During the FY, AVA assessed the safety of wooden food contact articles and metal composition of aluminium foils that are available in Singapore. Based on the laboratory test results, these food contact articles were found to be safe for use.

In addition, the safety and suitability of seven new food ingredients and two new food additives were assessed and permitted for use in food.

FOOD (AMENDMENT) REGULATIONS

The Food (Amendment) Regulations 2014 were gazetted on 15 December 2014, with the following changes:

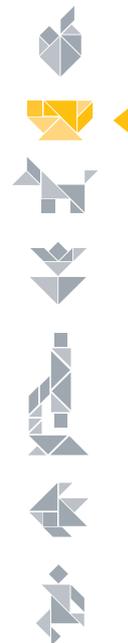
- Adoption of provisions for four new food additives
- Adoption of a new limit for mercury in predatory fish
- Extension of use of phytosterols, phytosterol esters, phytostanols and phytostanol esters in food

FOOD INCIDENTS MANAGEMENT

In the event of unexpected food safety incidents, AVA has in place a crisis management structure to enable quick response to the threats. Through swift response, AVA has been able to deal with unexpected incidents effectively and maintain public confidence in the safety of food available in Singapore.

BANNED HORMONE IN DANISH CROWN PORK

Danish Crown AmbA recalled pork from the stores after diethylstilbestrol (DES) was found in the urine of a pig slaughtered in Saeby, Denmark in July 2014. DES is a synthetic non-steroidal estrogen and was previously used in pig breeding to enhance the growth of animals. The hormone has been prohibited for use as a growth promoter in the EU since 1981 due to its adverse effects of endocrine disruption and carcinogenicity.



AVA took immediate action to sample and test all pork and pork products imported from Denmark under the brand of Danish Crown. A total of 39 consignments were tested but DES was not detected.

GUTTER OIL IN FOOD PRODUCTS FROM CHINESE TAIPEI

In September 2014, following a media report in Chinese Taipei that lard oil sold to food manufacturers had been contaminated with gutter oil, AVA swiftly launched a sampling and laboratory surveillance programme to evaluate the potential risk to local consumers.

AVA worked closely with importers to recall the affected food products. Consumer advisories on the affected products were also issued to alert the public.

AVA also corresponded with the Taiwanese Food and Drug Administration and Hong Kong Centre for Food Safety to halt exports of affected products to Singapore and provide updates on the discovery of new affected products.

As an added precaution, all imported and locally produced oil and related products were collected and sent to VPHL for various oil quality indicative tests, for total polar compounds, heavy metals and polycyclic aromatic hydrocarbons (PAHs). Results for total polar compounds and heavy metals were all within acceptable levels.

DIMETHYL YELLOW IN BEAN CURD PRODUCTS FROM CHINESE TAIPEI

In December 2014, authorities in Chinese Taipei reported that a non-permitted food dye, dimethyl yellow, had been detected in the "Te Chang" brand of dried bean curd products.

AVA worked with importers to recall affected products from the market. Consumer advisories were also issued to notify the public not to consume affected products.

In addition, AVA initiated a laboratory testing programme to evaluate the potential risk to local consumers. Dried bean curd and related product samples from imported sources and local factories were sampled for laboratory testing. The test results showed no trace of added dimethyl yellow and products were safe for consumption.

SODIUM MONOFLUOROACETATE IN MILK PRODUCTS FROM NEW ZEALAND

In March 2015, New Zealand received threats of an act to contaminate New Zealand milk products using sodium monofluoroacetate, a highly toxic rodenticide with the commercial name of '1080'. AVA took immediate action to check such products for the contamination. Testing of various milk products originating from New Zealand found no contamination by the compound.

STAKEHOLDER ENGAGEMENT AND COLLABORATION

AVA engages the local food industry through regular meetings, workshops, and dialogue sessions to share information, and foster collaboration and mutual understanding.

DIALOGUE SESSIONS AND TASKFORCES

AVA holds annual dialogue sessions with local food associations, namely the Singapore Fruits and Vegetables Importers and Exporters Association (SFVIEA), Singapore Food Manufacturers' Association (SFMA), Singapore Manufacturers' Federation (SMF), Seafood Industries Association Singapore (SIAS), Meat Traders' Association (MTA), Poultry Merchants' Association (PMA), and Eggs' Import/Export Trading Association (EIETA).

These dialogue sessions provide an effective platform to discuss matters that are beneficial to trade and the public.



AVA-Singapore Food Manufacturers' Association dialogue session held on 23 July 2014.

The Food Manufacturers Business Cluster (FMBC) provides a platform for members from AVA, the industry, and other government agencies to discuss common issues and devise solutions that will continue to ensure safe food, and help upgrade the standards of the local food industry. The FMBC formed various taskforces to look into work areas that cover food safety, food handlers' competency, upgrading of local food establishments, and food establishment licence application processes. During the FY, FMBC meetings were held on 28 May 2014 and 3 September 2014.

The FMBC is currently made up of members from SFMA, SMF, PMA, SIAS, Singapore Bakery and Confectionary Trade Association (SBCTA), International Enterprise Singapore, National Environment Agency (NEA), SPRING Singapore, Singapore Workforce Development Agency, and A*STAR.

INDUSTRY TRAININGS AND ROADSHOWS

AVA conducts industry technical trainings to provide insights into the areas of food safety management, food hygiene practices, HACCP system, good warehousing practices, and food defence. To enhance the local food industry's awareness of food safety, AVA conducted two seminars cum roadshows and reached out to 164 participants from 74 companies during the FY.

AVA also conducted briefings on food defence. During these sessions, AVA informed the local food industry of the need to prevent deliberate contamination of food products in their work place and processes. So far, the sessions had reached out to 438 participants from 266 companies.

COLLABORATIONS WITH OTHER AGENCIES

The Advisory Committee on the Evaluation of Health Claims, comprising reputable experts from government bodies, tertiary institutions, and the industry, was formed in August 2009. Since 2013, the Committee has proactively reviewed the use of health claims that were allowed in major developed countries, including those in the EU, Canada, Australia, New Zealand, and Japan. Following the adoption of three health claims in 2013, the Committee has embarked on the evaluation of another 95 claims in 2014. The evaluation is expected to be completed by 2015.

To effectively address public health issues, a 'One Health' platform – comprising AVA, the Ministry of Health (MOH), and NEA – was formed in 2012 to strengthen collaboration between the human, animal, and environmental health sectors. The collaboration covers protocols, communications, surveillance and risk assessments, as well as capability development, in the area of public health. Ongoing projects that involve One Health agencies include contingency plans for the prevention and control of zoonotic diseases, joint investigations in outbreaks of food-borne illnesses, and surveillance in farms and animal premises.

In May 2014, VPHC organised a symposium on the risk assessment and standards of arsenic in rice. Two experts were invited to speak on the topic – Dr Samuel M Cohen, Professor of Oncology, University of Nebraska; and Dr Junshi Chen, Senior Research Professor, China National Centre for Food Safety Risk Assessment. The symposium was attended by representatives from AVA, Ministry of Health (MOH), and NEA.

A food defence table top exercise was successfully conducted on 29 October 2014 with participation from government agencies such as the NEA, MOH, Singapore Police Force, and Ministry of Home Affairs.

SHARED RESPONSIBILITY IN FOOD SAFETY

Through the Food Safety Awards Night and public education programmes, AVA continues to emphasise the roles that the industry and consumers play in ensuring food safety.

FOOD SAFETY AWARDS NIGHT

The food safety Awards Night was held on 4 July 2014. Minister of State for National Development & Defence, Dr Mohamad Maliki Bin Osman, graced the event as the Guest-of-Honour. During the event, six Gold and 11 Silver awards, and 138 Certificates of Commendation were presented to the food industry.

Food Safety Partners, who have worked hand-in-hand with AVA to educate consumers on food safety, and maintained good food safety practices in their factory premises, were also recognised. AVA renewed the partnership status of three companies:

- Nestle Singapore (Pte) Ltd
- Singapore Food Industries Pte Ltd
- Tai Hua Food Industries Pte Ltd



AVA Chairman Mr Koh Soo Keong (5th from left), Minister of State Dr Mohamad Maliki Bin Osman, and AVA CEO Ms Tan Poh Hong with Food Safety Partners at the Food Safety Awards Night.

FOOD SAFETY PUBLIC EDUCATION

To ensure food safety from farm to fork, all parties in the food chain, from the government to food industries to consumers, must play their roles. While food industries and the government continue to work together to ensure food sold in Singapore is safe for consumption, it is also important to ensure consumers are equipped with good food safety knowledge so that food is safe at the point of consumption.

In FY 2014, 17 food safety talks and 14 learning journeys were conducted to educate about 13,000 students and adults on the importance of practising food safety tips. A total of 60 food safety mascot tours were carried out in 52 supermarket outlets over six weeks.

AVA also participated in community events, such as the Lam Soon Sandwich Making Competition, Braddell Heights Town Carnival 2014, and Whampoa Emergency Preparedness Day 2014, to spread messages on food safety.

In addition, interactive modular displays and our Food Safety bus were deployed to schools and community events to educate the public on food safety.

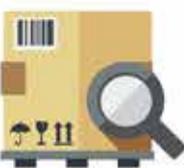
AVA collaborated with students pursuing the Early Childhood education diploma in Ngee Ann Polytechnic to develop storybooks to be used during school talks and community events. These giant storybooks, together with educational skits, arts and crafts activities, as well as games, were also featured in library exhibitions conducted in December 2014 at the Ang Mo Kio Public Library and Toa Payoh Public Library in February 2015.

In conjunction with the food safety month in July 2014, print and online advertisements were put up to educate the public on food safety. Tips on food safety were also posted on AVA's Facebook to reach out to consumers online.

AVA also reached out to travellers to inform them of the restrictions on animal, plant, and food items that could be brought into Singapore. We worked with NATAS to provide collaterals such as document folders that carried our messages to 31 travel agencies for distribution at the travel fairs held twice a year in March and August 2014. AVA reached out to over 60,000 visitors at the two travel fairs.



VETERINARY PUBLIC HEALTH LABORATORY PERFORMANCE OUTPUT FY 2014

		NO. OF SAMPLES TESTED 	NO. OF LAB TESTS PERFORMED 
	Health Certificates	2,553	17,497
	Quality Tests	4,218	93,438
	Import Control	32,662	1,238,406
	Surveillance	11,162	445,250
	R&D and Quality Assurance	1,337	4,486
TOTAL		51,932	1,799,077



ONGOING SURVEILLANCE OF FOOD PRODUCTS FY 2014

MEAT & MEAT PRODUCTS



Heavy metals, preservatives and additives (sulphur dioxide, boric acid, sorbic acid, colouring matter), rancidity, include peroxide value, free fatty acid and thiobarbituric acid, nitrate and nitrite, polycyclic aromatic hydrocarbon, poly-chlorinated biphenyls, dioxins, radionuclides, beta-agonist, nitrofurans, chloramphenicol, other antibiotics, hormones and growth promotants, coccidiostats, dexamethasone, organochlorine pesticides, Staphylococcal enterotoxins, *E. coli* O157:H7, *Salmonella* spp., *Listeria monocytogenes*, Vancomycin-resistant Enterococci, *Campylobacter* spp., parasites, anthrax contamination, physical quality, freeze-thaw, species ID

FRESH FRUITS & VEGETABLES



Pesticide residues, heavy metals, nitrates and nitrites, sulphur dioxide, radionuclides, *E. coli* O157:H7, *Salmonella* spp., *Listeria monocytogenes*, parasites, anthrax contamination

SEAFOOD & SEAFOOD PRODUCTS



Heavy metals, preservatives and additives (sulphur dioxide, boric acid, sorbic acid, colouring matter), formaldehyde, radionuclides, polycyclic aromatic hydrocarbon, nitrofurans, chloramphenicol, malachite green and its metabolites, other antibiotics, marine toxins, histamine, organochlorine pesticides, *Salmonella* spp., *Vibrio* spp., noroviruses, Hepatitis A and other viruses, parasites, anthrax contamination

PROCESSED FOOD



Heavy metals, antioxidants, 3- monochloro-propane-1,2-diol, 1,3-dichloropropanol, polychlorinated biphenyls, dioxins, nonpermitted flavouring agents, acrylamide, formaldehyde, residual chemicals in food-contact articles, migration of metals and chemicals from food-contact articles, ethyl carbamate, N-nitrosamines, mineral hydrocarbons, benzene, bromate, radionuclides, trihalomethanes, synthetic organic colours, sudan dyes, para red, non-permitted colours, chemical preservatives, artificial sweetening agents, propionic acid, maleic acid, crude fat, nitrogen, sugar profile, methanol, pesticide residues, drug residues, screening of irradiated food, adulterants, food authentication, histamine, mycotoxins, bacterial toxins, microorganisms



ANIMAL HEALTH & WELFARE



Pets can be man's best friends. AVA protects the health of our furry friends and keeps out major zoonotic diseases. We also work hard to enhance the standards of animal welfare in Singapore.



ANIMAL HEALTH AND WELFARE

Safeguarding Animal Health and Welfare

AVA continues to keep the nation free from major exotic and zoonotic diseases, such as Foot and Mouth Disease, rabies, Nipah virus, Avian Influenza, Bovine Spongiform Encephalopathy, anthrax, and brucellosis. We do so via comprehensive and integrated programmes, comprising import regulation and inspection, risk analysis, as well as laboratory testing and surveillance, that ensure both animals and humans in Singapore stay healthy and safe from such threats. /



Dr Chew Siang Thai (AVA Director-General for Agri-Food & Veterinary Services) receiving the Animal Health Status Certificates from Dr Karin Schwabenbauer (President of the Council of OIE) and Dr Bernard Vallat (Director-General of OIE).

DISEASE-FREE RECOGNITIONS

The World Organisation for Animal Health (OIE) recognised Singapore as free from Contagious Bovine Pleuropneumonia (CBPP) and Peste Des Petits Ruminants (PPR) during the 82nd General Session of the World Assembly of Delegates of OIE held in Paris, France, from 25 to 30 May 2014.

OIE categorises Singapore under the 'negligible risk' status for Bovine Spongiform Encephalopathy. The United States Department of Agriculture announced on 29 October 2014 that it recognised this risk status, which would facilitate the export and transshipment of beef and beef products from Singapore to the USA.

PREVENTING THE INTRODUCTION OF ANIMAL DISEASES

AVA has in place a range of strategies to guard against the introduction and spread of animal diseases in Singapore. The regulation of animal imports into Singapore is a key strategy. In addition, AVA maintains a comprehensive animal disease surveillance programme, which includes the surveillance of local and imported animal populations for harmful pathogens.

REGULATION OF ANIMAL IMPORTS

AVA also closely monitors the animal disease situation in the countries and region we trade with. In the event of an outbreak of a disease of concern, AVA may suspend imports from affected countries to prevent the introduction of the disease to Singapore. When the disease outbreak is resolved, or when AVA assesses that the necessary risk mitigation measures have been implemented, AVA will consider lifting the suspension from such countries to minimise trade disruption.

AVA also works with exporting countries on a regionalisation approach for diseases such as the Avian Influenza (also known as bird flu). The approach, which is in line with OIE recommendations, allows AVA to impose suspensions only on affected parts of the exporting country during disease outbreaks. At the same time, the safety of imported animal products is not compromised.

In addition, AVA collaborates with the Immigration and Checkpoints Authority (ICA) to monitor imports and combat animal smuggling.



Upon arrival at AVA's Changi & Animal Quarantine Station, imported pets will undergo veterinary inspection, as well as quarantine, if required.

REVIEW OF IMPORT AND QUARANTINE CONDITIONS

Veterinary conditions for the importation of dogs and cats, horses, poultry, poultry products, and live birds, as well as sheep and goats for religious slaughter, were reviewed in FY 2014.

Import Conditions for Dogs and Cats

AVA's current risk-based system – of categorising countries based on an assessment of each country's rabies status and disease control measures – has been instrumental in keeping Singapore free from rabies. AVA systematically reviews this system so that the status of countries can be updated depending on their rabies situation.

Dogs and cats from each category are subject to different Veterinary Conditions. In FY 2014, AVA's risk assessment led to the classification of Cyprus, Estonia, and Malaysia as Category 'C' countries (with controlled risk or low incidence of rabies).

Import Conditions for Horses

The Republic of Korea has been recognised as an approved country for the return of Singapore horses from international races and competitions with effect from 10 July 2014.

Import Conditions for Poultry, Poultry Products, and Birds

In September 2014, AVA amended the veterinary conditions for the import of birds, poultry, and poultry products from countries affected with Avian Influenza to be in line with OIE's revisions and recommendations.

The term "notifiable Avian Influenza" was changed to "Avian Influenza", and the period an exporting country has to be free from Avian Influenza was reduced from six months to three months.

Notwithstanding these revisions, Singapore's import policy remains unchanged, which is to restrict imports from countries infected with Avian Influenza outbreaks caused by any influenza A viruses which are notifiable to OIE.

Import of Sheep and Goats for Religious Slaughter

For *Korban* 2014, AVA facilitated the import of 2,200 sheep from Australia and 1,697 sheep from Ireland. That was the first time that sheep were brought in from Ireland for religious slaughter.

During the FY, approval was also granted for Japan to export sheep and goats to Singapore for religious slaughter, following AVA's assessments.

ISSUANCE OF LICENCES AND PERMITS

In FY 2014, AVA issued 57,246 import licences/permits for animals, birds, eggs, veterinary biologics, and animal products.

Category	No. of Permits Issued
Pigs, poultry, and eggs	34,463
Animals (dogs, cats, small mammals, livestock, zoo animals)	3,605
Biologics	157
Birds	89
Ornamental fishes	18,336
Eggs (Specific Pathogen-Free eggs, specimens for laboratory tests)	12
Products (blood, sera, urine, clinical specimens)	584
Total	57,246

SURVEILLANCE ON ANIMAL IMPORTS

Imported Poultry and Eggs

Imports of poultry (chickens and ducks) and eggs are regularly sampled to test for Avian Influenza, *Salmonella* spp., and other contaminants. In FY 2014, one chicken broiler and three layer farms were suspended following detection of *Salmonella Enteritidis*. In addition, 10 chicken broiler farms were suspended after detection of drug residues. To be reinstated for export to Singapore, suspended farms would have to submit their request along with supporting documents, and undergo an inspection by AVA.

Separately, seven consignments of chickens were rejected due to labelling infringements.



Imported Pigs

AVA continued to monitor imported pigs for swine influenza, as part of our animal health surveillance programme. The H1N1 (2009) swine influenza virus was not detected in pigs exported to Singapore, and the meat was safe for consumption.

Import Requirements for Ornamental Fish

Under AVA's regulatory surveillance for imported ornamental aquatic animals, we tested 168 batches of koi for Koi Herpes Virus (KHV) and 100 batches of crustaceans for White Spot Syndrome Virus (WSSV) in FY 2014. WSSV was detected in one batch of crayfish imported from Indonesia in December 2014. This batch of crayfish was humanely euthanised.

Enforcement against Illegal Imports

On 9 September 2014 and 30 March 2015, the smuggling of 13 and seven puppies from Malaysia was intercepted, respectively. The offenders were prosecuted for illegal import of animals and animal cruelty, and sentenced to five months and eight months of imprisonment, respectively.



Seven puppies that were illegally imported without licence.

LOCAL DISEASE SURVEILLANCE

Local Poultry and Ornamental Bird Farms

All local poultry farms were monitored for *Salmonella Enteritidis*, Avian Influenza, and Newcastle Disease in FY 2014. *Salmonella Enteritidis* was detected in two local poultry farms and the infected flocks were culled or treated with pro-biotics and organic acids. Eggs from these flocks were sent to an AVA-approved liquid-egg processing plant. Isolation orders issued for all infected flocks were subsequently lifted after flocks were tested negative for *Salmonella Enteritidis* in two consecutive rounds.

In addition, all ornamental bird farms were monitored in FY 2014 for Avian Influenza and Newcastle Disease. AVA inspected these farms to ensure vigilance in bio-security and upkeep of good farm management practices.



Inspection at a local goat farm.

Livestock Farms

During FY 2014, our local ruminant farms continued to be free from Bovine Spongiform Encephalopathy, Bovine Tuberculosis, Foot and Mouth Disease, *Listeria*, and *Brucella*. Four local ruminant farms that had been tested positive for *Escherichia coli* (*E. coli*) O157:H7 remained under isolation orders. The farms were advised to treat livestock with pro-biotics, and the pasteurised milk produced by the farms was tested to ensure it was safe for human consumption.

Fish Farms

AVA continued to monitor for notifiable and emerging diseases of economic importance to the aquatic animal industry during the FY. Surveillance was conducted on both coastal and land-based fish farms, and results showed that Singapore remained free from Spring Viraemia of Carp Virus, KHV, *Aeromonas Salmonicida*, and Epizootic Ulcerative Syndrome in FY 2014.

Passive surveillance, which involves the testing of susceptible species only, was carried out for the following freshwater diseases in local ornamental fish farms: Viral Haemorrhagic Septicaemia (VHS), Infectious Haematopoietic Necrosis Virus (IHNV), Epizootic Haematopoietic Necrosis Virus (EHNV), and Infectious Spleen and Kidney Necrosis Virus (ISKNV). These diseases were not detected in samples submitted for diagnosis.



An AVA officer conducting surveillance at a local fish farm to monitor for notifiable and emerging diseases of economic importance to the aquatic animal industry.

During FY 2014, AVA continued with surveillance on Chytrid fungus in locally farmed frogs (for both food and ornamental purposes). Following the detection of Chytrid fungus in a batch of ornamental frogs, AVA immediately imposed orders of isolation and culling, to prevent the disease from spreading. Additional testing was carried out, and the remaining batches of frogs were culled following further detection of the disease.

AVA provides free extension services and disease diagnosis services to local coastal food fish farms. As part of these services, marine fish diseases, such as ISKNV, Viral Nervous Necrosis Virus (VNNV), Singapore Grouper Iridovirus (SGIV), and Big Belly disease, were detected in local seabass, black grouper, mullet, and pompano. AVA worked closely with the affected farmers to improve their management of animal health, including recommendations to vaccinate the fish against diseases.

In March 2015, Red Sea Bream Iridovirus (RSIV) was detected in samples from a local coastal fish farm. As RSIV is an OIE-notifiable virus, AVA ensured that

sick fish were promptly removed and only healthy ones were harvested. The health of the remaining fish stocks was monitored.

Under the voluntary Imported Fingerling Surveillance Programme, AVA continued to assist participating local farms to screen imported fry and fingerlings for diseases of concern prior to stocking, with the aim to help farms increase production through reduced mortality. A wide range of tests were carried out, including virology, bacteriology, parasitology, and post-mortem analyses. Ten batches of samples were received in 2014 and VNNV, a significant disease that causes high mortality rates at the nursery stage, was detected in two batches of imported Grouper. AVA provided technical assistance to fish farmers to improve farm management and bio-security, and is exploring vaccination options in susceptible species.



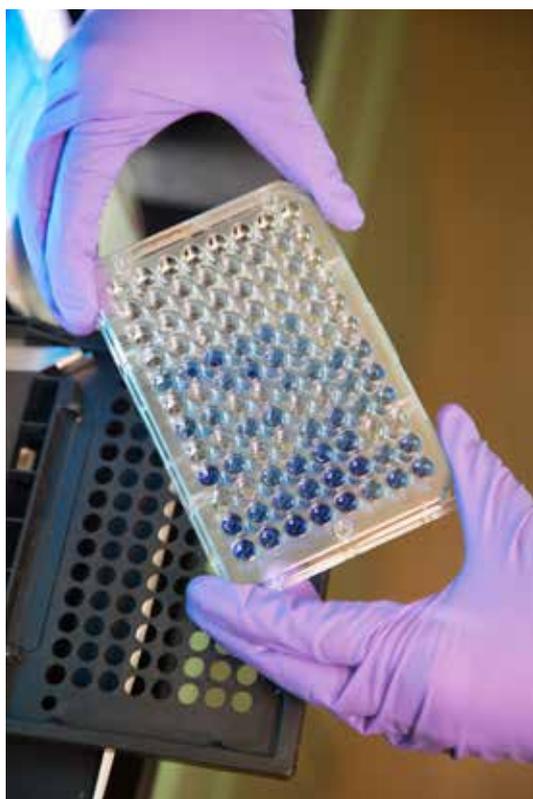
LABORATORY CAPABILITIES

The Animal Health Laboratories (AHL) located at AVA's Animal and Plant Health Centre (APHC) is the national reference laboratory for animal diseases. AHL also carries out the testing of animal vaccines.

In FY 2014, AHL conducted a total of 144,905 laboratory tests to detect and identify diseases in animals, birds, and fish.

During the FY, AHL expanded its diagnostic repertoire to include testing capabilities for the molecular detection of novel Bluetongue Virus, African Horse Sickness Virus, Classical Swine Fever Virus, Middle East Respiratory Syndrome Coronavirus (MERS-CoV), Marek's Disease Virus, Swine Vesicular Disease Virus, *Lyssavirus*, *Avipoxvirus*, Inflammatory Bowel Disease, henipah viruses, and *Toxoplasma gondii*.

AHL also established an Enzyme-Linked Immunosorbent Assay (ELISA) test for the detection of heartworm antibody in dogs. This test will supplement the heartworm rapid test kit that is currently being used.



An Enzyme-Linked Immunosorbent Assay (ELISA) test for the detection of heartworm antibody in dogs.

AHL continued to attain the ISO/IEC 17025 accreditation that is administered by the Singapore Accreditation Council – Singapore Laboratory Accreditation Scheme (SAC-SINGLAS). This accreditation reflects the competence of AHL's quality assurance system and its commitment to high laboratory testing standards in the field of chemical and biological testing.

Since 2004, AHL has been benchmarking its testing capabilities by participating in several inter-laboratory proficiency testing programmes administered by the Animal & Plant Health Agency (UK), Australian Animal Health Laboratory, as well as the French Agency for Food, Environmental and Occupational Health & Safety. We continued to achieve consistently good results for these programmes.

SAFEGUARDING AGAINST BIRD FLU

During the FY, AVA inspected all local poultry farms to ensure that bio-security and bio-segregation measures were strictly adhered to, and that all poultry houses were bird-proofed. Samples were also collected fortnightly for Avian Influenza testing. We collaborated with the National Parks Board (NParks) on the surveillance of H5/H7 Avian Influenza, including H7N9/2013 in migratory and wild birds in the Sungei Buloh Wetland Reserves, Pulau Ubin, and Singapore Botanic Gardens. The 542 samples collected tested negative for H5/H7 Avian Influenza. The swans in the Singapore Botanic Gardens were given Avian Influenza booster vaccination shots. Cloacae swabs sampled from the swans were tested negative for H7N9 Avian Influenza.

In collaboration with the National Environment Agency (NEA), 1,242 urban birds (crows, pigeons, mynahs and others) were also tested and found to be free of Avian Influenza virus.

ANIMAL WELFARE

AVA safeguards the welfare of animals and prevents animal cruelty through regulation, enforcement, and education. In this role, AVA has to deal with a spectrum of attitudes towards animals, which ranges from people who find animals a nuisance to those who are passionate about animal welfare.

ANIMAL WELFARE LEGISLATION REVIEW COMMITTEE

In April 2012, the Animal Welfare Legislation Review Committee (AWLRC) was formed to review existing legislation on animal welfare matters, while balancing the very diverse interests of the community at large. AWLRC put up 24 legislative and non-legislative recommendations to the Ministry of National Development, which were all accepted in April 2013.



Members of Parliament Mr Yeo Guat Kwang, Mr Alex Yam, Mr Gan Thiam Poh, Mr Edwin Tong, and Mr Vikram Nair tabled a Private Member's Bill in Parliament in September 2014 to amend the Animals and Birds Act to give effect to some of the recommendations made by the AWLRC. The Private Member's Bill was passed on 5 November 2014. Amendments to the Animals and Birds Act were gazetted on 16 January 2015 to:

- Introduce the concept of Duty of Care (which the pet owner has to fulfil with respect to providing care to an animal under his or her charge).
- Introduce the Codes of Animal Welfare.
- Impose mandatory training for the pet industry.
- Raise penalties for acts of animal cruelty.

REGULATING PET RETAILERS AND DOG FARMS

In FY 2014, there were 251 licensed pet shops, as compared to 245 in the preceding year. Regular inspections were carried out in pet shops to ensure compliance with licensing conditions and that shop standards were maintained. Compound penalties were issued to 11 pet shops that failed to comply with licensing conditions, as compared to 13 in the last FY.

AVA grades pet shops to enhance their competencies and standards, which helps inform the public of the standard of the pet shop that they patronise. The shops are graded according to their compliance with licensing conditions and adoption of best practices. The grades are displayed in the shop and also on AVA's website. In FY 2014, 67 percent of the shops graded attained either an A or B grade. None of the shops was given the lowest D grade.

ENFORCEMENT AGAINST ANIMAL CRUELTY

AVA investigated 606 complaints of alleged animal cruelty during the FY. Of these, four offenders were issued composition fines. No actions were taken in a few cases due to insufficient evidence. For the majority of cases, counselling was provided, where appropriate.

REGULATING RESEARCH INSTITUTIONS

AVA licenses animal research facilities that use animals for scientific purposes. Research facilities are required to comply with guidelines set by the National Advisory Committee for Laboratory Animal Research (NACLAR) on the care and use of animals in research. As at 31 March 2015, there were 27 research facilities with 75 licensed premises. Animal holding facilities are inspected annually, while procedural rooms are inspected every other year.

PUBLIC EDUCATION PROGRAMME ON RESPONSIBLE PET OWNERSHIP

Besides having in place regulations to safeguard the health and welfare of our animals, AVA also actively educates the public on the importance of being responsible and considerate pet owners.

In championing animal welfare, AVA proactively works with the community and educates the public on animal welfare and responsible pet ownership (RPO). Through our public education programme on RPO, we aim to foster a humane and gracious society for all, where pet owners, non-pet owners, and animals co-exist in greater harmony.

COMMUNITY EVENTS

In celebration of World Animal Day, AVA partnered the Society for the Prevention of Cruelty to Animals (SPCA) for a weekend event at United Square Shopping Mall on 27 and 28 September 2014. An 'apartment showroom' concept was adopted at the event to show visitors tips on how to be a responsible and considerate pet owner in various parts of the home and residential community. Visitors who completed a set of educational questionnaire were given goodie bags with AVA collaterals. As the event coincides with World Rabies Day on 28 September 2014, visitors also learned about rabies and the precautions to take if they visit rabies-endemic countries in the region. The event saw a turnout of 1,500 visitors.



The apartment showroom concept incorporates pet care tips on how to be a responsible and considerate pet owner at home and in our community.



A Singapore Book of Records was set for the 'Largest Gathering of People with Cat Faces' during the 'I Adopt... Love' event on 31 January 2015.

With a new theme 'I Adopt... Love', an adoption drive was held on 31 January 2015 to encourage potential pet owners to consider adoption first. The event at the Big Splash, East Coast Park featured about 100 animals from 10 animal welfare groups. About 4,500 visitors attended the event and 22 pets were adopted. With Cat Welfare Society (CWS) as the main partner of the event, we also set the Singapore Book of Records for the *Largest Gathering of People with Cat Faces*. Some 124 cat lovers' faces were painted with colours, whiskers, and button noses for this activity.

At the Pet Expo held on 20-22 March 2015, AVA organised 'speed dating' sessions for approximately 150 potential pet owners to interact with dogs-for-adoption from seven animal welfare groups. Other animals were also up for adoption. A total of 21 animals were adopted. The event drew 25,400 visitors.



Potential pet owners interacting with dogs that were up for adoption during the 'Speed Dating' session at Pet Expo.

Other Outreach Efforts

AVA continued to support community pet events organised by the People's Association, and Neighbourhood and Resident Committees, etc, and reached out to 32,000 people.

To educate our young about RPO, school talks and learning journeys to AVA's Centre for Animal Welfare & Control were conducted for 7,000 students to instil in them a sense of responsibility and commitment to pet ownership.

Public engagement via social media and the Internet sphere was sustained during the FY with our regular blog themes of 'Beat the Monday Blues', 'Pet Care Tips', and 'Pet Adoption Fridays' (featuring adoptable animals from animal welfare groups for adoption).

ANIMAL MANAGEMENT

LICENSING OF DOGS

Dog licensing is an integral part of AVA's responsible pet ownership regime, as well as our animal and public health framework. It establishes accountability for the care and management of dogs by pet owners, and facilitates contact tracing in the event of a rabies outbreak. Rabies is a fatal viral disease that can be transmitted to humans by the bite of a rabid animal. Dogs are considered to be highly significant vectors for the spread of rabies.

All dogs above three months of age have to be licensed by AVA for rabies control. In the FY, AVA issued 60,440 dog licences. Enforcement was carried out on errant dog owners who did not comply with the dog licensing rules and conditions.

As part of ongoing efforts to promote responsible pet ownership, AVA encourages dog owners to sterilise their dogs to prevent unwanted breeding, which could contribute to abandonment and public safety issues. Following the increase in licence fees for unsterilised dogs in February 2014, the percentage of sterilised dogs increased to 63 percent this FY, up from 57 percent in FY 2013.

FIRST RESPONDER PROTOCOL

Animal-related issues are usually complex and the effective resolution of such issues often requires the efforts and cooperation of various public agencies.

To achieve better inter-agency collaboration on animal-related issues, AVA took on the role of First Responder for animal-related feedback with effect from 1 March 2012. As First Responder, AVA acts as the lead in coordinating relevant agencies to ensure swift and effective actions are taken by respective agencies. AVA also coordinates joint replies to feedback providers.

AVA's efforts to improve service delivery as a First Responder earned us the Best Practice Award (Inter-agency Collaboration) at the Excellence in Public Service Awards Ceremony 2014, as well as the Minister's Award (Team) 2014.

Since taking on the role as the first responder on animal-related issues, AVA has established a 24-hour hotline for the public to report any animal-related feedback. During the FY, the volume of feedback received rose by 25 percent to 20,370 cases, up from 16,305 cases in FY 2013.

MANAGEMENT OF STRAYS

AVA continues to conduct control operations to manage the stray population and ensure public health and safety. Stray dogs, especially when in a pack, can threaten public safety. Keeping the stray dog population in check also helps to mitigate the spread of rabies should there be an incursion of the disease.

In FY 2014, AVA impounded 1,619 stray dogs and 1,127 stray cats.

In FY 2014, 300 dogs were successfully re-homed from AVA's pound. To further facilitate the re-homing of impounded dogs, AVA waived the first year of the annual licence fee for dogs released from AVA's pound to re-homing partners. The re-homed dogs must be sterilised and re-homing partners must ensure that the dogs are not released back into the environment again.

Project ADORE is a multi-agency project launched in April 2012 to re-home suitable mid-sized mongrel dogs in Housing & Development Board (HDB) flats. The project involves MND, AVA, HDB, SPCA, and Action for Singapore Dogs. In May 2014, another re-homing partner, Save Our Street Dogs, came on board the project. As at 31 March 2015, Project ADORE had successfully placed 100 dogs in HDB homes.



AVA officers receiving the Minister's Award (Team) 2014 from Mr Khaw Boon Wan (Minister for National Development).



Besides the re-homing pilot for dogs, Project Love Cats debuted in Chong Pang in October 2012, and is led by CWS, with the support of MND, AVA, HDB and Sembawang-Nee Soon Town Council. In November 2014, Project Love Cats was extended for another two years until October 2016. As at 31 March 2015, there were 126 households owning 278 cats under the project.

In 2011, AVA piloted a Stray Cat Sterilisation Programme in collaboration with CWS and four town councils (Sembawang-Nee Soon, Tampines, Ang Mo Kio, and Marine Parade), to sterilise community cats and ensure that they are properly managed by appointed caregivers. Under this programme, AVA funds 50 percent (up to \$30 for male cats and \$60 for female cats) and \$20 for sterilisation and microchipping costs, respectively. In May 2014, the programme was expanded to subsidise the sterilisation of stray cats in HDB residential estates island-wide. As at 31 March 2015, 1,165 stray cats in Singapore were sterilised under the programme.

In addition to advising the management of industrial and commercial sites on ways to control the population of stray dogs and cats on their premises, AVA also educates the public on ways to reduce problems caused by stray dogs and cats in their neighbourhood. In addition, AVA works with NParks to advise residents on ways to avoid unpleasant encounters with stray monkeys.

ANIMAL MANAGEMENT FY 2014	
Category	Quantity
Licensing of Dogs	
New dog licenses issued	11,562
Dog licenses renewed	48,878
Total	60,440
Control of Stray Animals and Birds	
Stray dogs impounded	1,619
Stray cats impounded	1,127
Others	2,408
Total	5,154
Re-homing of Stray Animals	
Stray dogs re-homed from AVA's pound	300
Feedback on Animal and Bird Nuisance	
Dogs	7,127
Cats	4,557
Pigeons	2,945
Monkeys	761
Others	4,980
Total	20,370

VETERINARY PROFESSION

AVA regulates the veterinary profession in Singapore and licenses veterinarians and veterinary centres. As at 31 March 2015, there were 322 veterinarians and 70 veterinary centres licensed by AVA.

In July 2014, AVA established the Veterinary Profession Committee (VPC), comprising veterinarians from private practice, research industry, academia, and the government. The VPC seeks to chart the future of the veterinary profession by developing strategies to support and improve the veterinary industry, and promote their contributions to society. Two visioning exercises were organised in October 2014 with private veterinarians to develop a vision for the veterinary profession for 2025. Participants identified current and emerging challenges the profession faces and strategies to overcome them. These inputs will be used to develop a roadmap for the veterinary profession.

AVA also collaborated with private veterinarians to conduct Free Pet Health Checks in 2014 to provide basic clinical examination and veterinary advice to pet owners at no cost. The first FPHC was launched on 15 February 2014 at the Jurong Spring Community Club by Minister of State for National Development, Mr Desmond Lee. This was followed by two more sessions at the Asian Women Welfare Association on 20 September 2014 and Marine Parade Community Club on 8 November 2014.



A private veterinarian providing basic clinical examination and veterinary advice during a Free Pet Health Check session organised by AVA.

STAYING ALERT AGAINST EMERGING THREATS & ISSUES

AVA's horizon scanning function helps the organisation to pick up overseas reports of animal disease outbreaks, discoveries of unexpected or novel pathogens, and changes in the behaviour of known pathogens from open sources. AVA keeps an eye on animal diseases that can pose a threat to overall animal and public health in Singapore, such as Bovine Spongiform Encephalopathy, Avian Influenza, rabies, Hendra Virus, as well as Foot and



AVA officers donned Personal Protective Equipment during the Avian Influenza contingency training session.

Mouth Disease outbreaks. Our daily scanning helps enhance AVA's operational readiness by providing lead time for AVA to take immediate measures to safeguard the health of our animals, as well as public health in Singapore.

OIE MEETINGS

The OIE – an international organisation responsible for improving animal health – provides expertise and information on animal diseases, promotes transparency in the status of world animal diseases, and develops international standards for combating animal diseases.

To keep abreast of international standards for animal health and the control of major animal diseases worldwide, AVA represented Singapore at the 82nd General Session of the World Assembly of Delegates of OIE held in Paris, France, from 25 to 30 May 2014. The following official recognitions were accorded to Singapore during the Session:

- Recognition of AVA's Veterinary Public Health Centre as an OIE Collaborating Centre for Food Safety.
- Singapore as a country free from contagious bovine pleuro pneumonia.
- Singapore as a country free from peste des petits ruminants.

EMERGENCY PREPAREDNESS

AVA conducted an Avian Influenza contingency training session for about 120 officers on 5 and 6 February 2015 at the Veterinary Public Health Centre (VPHC). The training familiarised officers with the contingency plans, as well as with the proper donning and doffing of Personal Protective Equipment.

AVA's first rabies simulation exercise, codenamed Exercise Lyssa I, was successfully completed on 9 September 2014. Exercise Lyssa I was a table top exercise which tested the operational feasibility, command, and control of AVA's rabies contingency plan. AVA also tested the mass Alert-Recall-Mobilise System, as well as the activation and delivery of 5,000 doses of rabies vaccines from the OIE Regional Vaccine Bank for Rabies in Asia to serve as our local stockpile.



5,000 doses of animal rabies vaccines were activated and delivered to serve as our local stockpile.





Over 300 participants attended AVA's inaugural One Health Symposium on 8 August 2014.

STAKEHOLDER ENGAGEMENT AND COLLABORATION

AVA collaborates with the industry, research institutes, local educational institutes, and overseas partners to develop new diagnostic methods for the detection of important animal diseases, as well as to conduct epidemiological studies of significant diseases, and enhance surveillance efforts.

ONE HEALTH SYMPOSIUM

With the support of One Health agencies (i.e. Ministry of Health and NEA), AVA organised the inaugural One Health Symposium on 8 August 2014. The One Health approach brings together public health, veterinary health, and environmental health professionals in ensuring public health in Singapore. The aim of the approach is to strengthen the prevention, surveillance, and response to zoonotic diseases and public health threats in Singapore, and do so in a timely and coordinated manner.

Over 300 participants from government agencies, local veterinarians, public health practitioners, academia, and research institutes attended the symposium. Topics on initiatives, collaboration, challenges, emerging issues related to the One Health approach were covered.

VACCINE AND TEST METHOD DEVELOPMENT

AVA continued to partner Temasek Life Sciences Laboratory on the development of a multivalent bird flu vaccine and a universal detection kit for Avian Influenza. Our collaboration with Veredus Laboratories is also in progress to produce a lab-on-chip that has the ability to concurrently detect multiple avian pathogens in one test. Both projects are due to be completed in FY 2015.

CONTROL OF BIRD FLU IN KEPRI

In FY 2014, AVA continued its efforts to assist Indonesia to control bird flu in Kepri. There was no report of bird flu outbreaks in Kepri during the FY. Our officers visited Batam and Bintan several times during the FY to exchange information on bird flu and to urge Kepri authorities to implement control measures against movement of poultry from affected provinces due to bio-security and animal health concerns. During the visits, AVA officers briefed the Kepri authorities on the regional bird flu situation and the emerging risk of A(H7N9).

AVA continued to support Kepri's bird flu surveillance through the supply of rapid test kits, disinfectants, and personal protective equipment. AVA also contributed relevant materials in support of Kepri authorities' public education efforts in primary schools.

WORKSHOPS, SEMINARS & WORKING GROUPS FOR LOCAL POULTRY FARMS

Bio-security workshops were conducted in FY 2014 to educate poultry farm owners and workers on the importance of, and their role in maintaining bio-security.

During the workshops, AVA conducted training on the proper donning and doffing of personal protective equipment for workers in local poultry farms.

The local Poultry Farms Working Group, comprising representatives from AVA and the local poultry layer farms, was formed in 2013 to discuss matters related to AVA's surveillance programmes, among other issues. The platform also provided AVA with an opportunity to enhance the industry's understanding of bio-security and poultry health.

During the FY, the working group revised the *Salmonella Enteritidis* surveillance programme in local poultry farms, and worked on issues related to the sale of spent hens, manpower, Avian Influenza contingency plans, and drug usage.

TRAINING FOR LOCAL FISH FARMS

In a workshop organised by AVA in May 2014, the Tropical Marine Science Institute and a commercial aquarium provided local food-fish farms with a better understanding of harmful algal blooms and closed containment aquaculture systems. AVA also introduced the use of semi-moist feed for fish species and demonstrated the semi-moist fish feed making process.

In September 2014, AVA organised a workshop to engage local food-fish farmers on the Good Aquaculture Practice for Fish Farming (GAP-FF) Certification Scheme. At the same time, learning points from our study trips to the Netherlands and Denmark were also shared to keep farmers abreast of the advanced aquaculture technology used in farms there.

In January 2015, AVA, the Police Coast Guard, and Singapore Civil Defence Force, jointly held a workshop to equip farmers with basic fire-fighting skills.

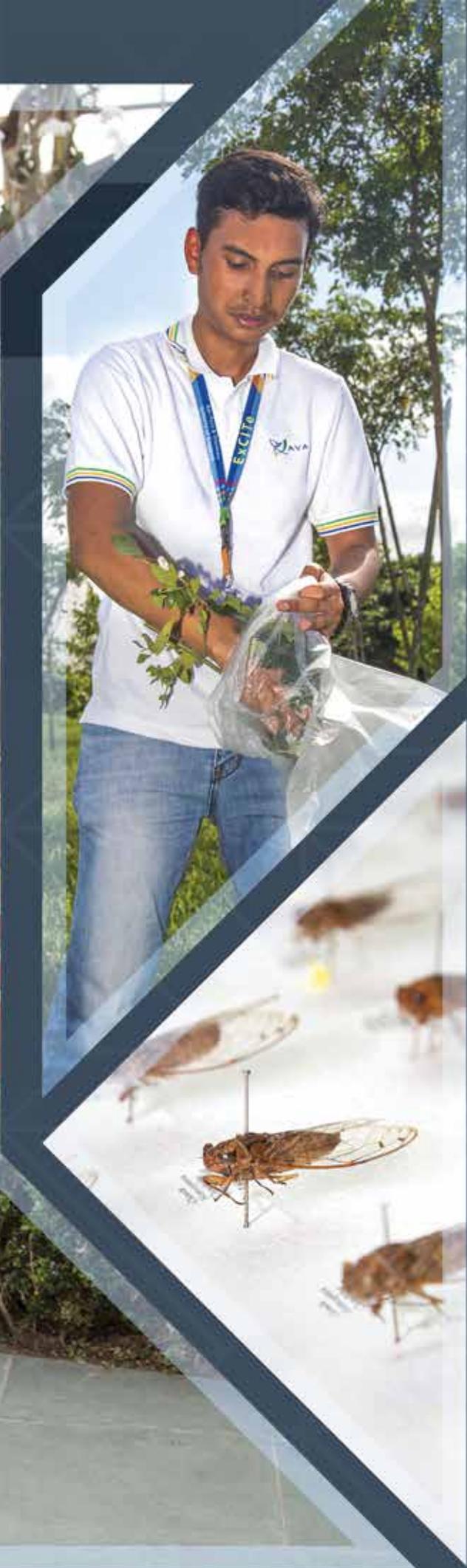




PLANT HEALTH



The lush greenery of our landscape has earned Singapore the reputation of being a Garden City. Working behind the scenes, AVA safeguards the health of our flora and keeps plant pests at bay.





PLANT HEALTH

Safeguarding Plant Health

AVA is committed to protecting our local flora from the negative impact of exotic and emerging indigenous plant pests. Through a robust science-based and internationally recognised plant health regulatory system, we aim to maintain plant bio-security to protect the sustainability and diversity of our landscape. Our comprehensive plant health programmes, comprising import regulation and inspection, risk analysis, as well as laboratory testing and surveillance, has successfully kept Singapore free from important quarantine pests. These include the stored product pest Khapra beetle, Mediterranean and Queensland fruit flies, as well as the fungal disease of rubber - the South American Leaf Blight. Our efforts are supported by the close cooperation and partnership with local government agencies and plant industries.

PREVENTING THE ENTRY OF PLANT PESTS

As Singapore imports several species of plants that are not grown locally, AVA works to ensure the smooth import of plants without compromising plant health. With large amounts of plants moving across our borders daily, AVA collaborates with the Immigration and Checkpoints Authority (ICA) and Singapore Post to monitor imports closely, and safeguard our plants against pests that can cause significant economic losses through reduced yields and quality.

IMPORT CONTROL AND INSPECTION

AVA regulates the import of plants and plant products through stipulated plant health import requirements. During the FY, 35,641 import permits were issued.

AVA also conducted 3,365 post-entry inspections to ensure compliance with import health requirements. To detect pests, samples were collected for laboratory tests. In cases where injurious pests were detected, importers were given the option of treatment, if feasible, or destruction of the consignment.

Imported Living Organisms

Through the administration of the Bio-security Assurance Arrangement (BSAA) Scheme, AVA regulates the import of living organisms, such as live insects and micro-organisms, which have an impact on the environment. Importers are required to have proper facilities and management procedures to

prevent the escape of these living organisms. AVA conducts audits on their facilities and procedures periodically. There were 31 BSAA members at the end of the FY.

PLANT HEALTH SURVEILLANCE

Imported Plants

Imported ornamental plants and plant products can potentially introduce invasive plant pests. Our comprehensive plant inspection and surveillance programmes as well as high plant health standards have successfully kept major international quarantine pests such as the South American Leaf Blight, Mediterranean and Queensland fruit flies, Khapra beetle, and Larger Grain Borer away from Singapore. Based on data collected since 2005, there have been no interception of major quarantine pests.

As part of our monitoring efforts on these quarantine pests, a total of 88 visits were conducted to collect 950 samples for analysis in FY 2014. These pests were not detected.

In addition, both import and export consignments of plants and plant products were checked for the presence of Khapra beetle. An additional pest, *Prostephanus truncatus* (Larger Grain Borer), was included in the surveillance programme during the FY. Both pests of stored products are listed under the First Schedule of the Control of Plants (Plant Importation) Rules as regulated quarantine pests.



AVA surveillance officers collecting samples at a vegetable farm for laboratory diagnosis.

Our ongoing surveillance of fruit flies did not detect any quarantine fruit flies. Hence, the risk of introduction of quarantine fruit flies into Singapore is considered to be low.

Local Plants

AVA closely monitors the establishments involved in the cultivation of plants, flowers, and vegetables to keep them free from quarantine pests and new pest incursions. Singapore continues to be free from the following targeted quarantine pests viz., the Khapra beetle, Mediterranean fruit fly, Queensland fruit fly, South American Leaf Blight, *Aphelenchoides fragariae* (Foliar nematode), and *Puccinia psidii* (guava rust disease).

AVA targets high volume nurseries, local farms, and identified high-risk sites near ports of entry for post-border control measures. In FY 2014, AVA conducted more than 700 surveillance visits and collected nearly 12,000 samples to check for endemic pests, new pest incursion, and plant health in general. There were about 12,000 pest detections from these samples in total. Pest control advisories were provided to owners of the affected premises. These results helped to provide the host-pest association and improve the health status of various plant species.

In 2013, quarantine nematode *Aphelenchoides fragariae* was detected in a local farm. AVA conducted a delimiting survey in FY 2014 to determine the

boundaries of the area that was infested by or free from this pest. Results confirmed the absence of this pest in Singapore.

AVA supports our local farms with our technical expertise. In FY 2014, we provided pest management advisory to one local farm.

In addition to farms, AVA also helps to keep plants in tourist attractions such as Gardens by the Bay (GBB) healthy. Regular monitoring was carried out by AVA at GBB to check for the presence of exotic pests. Around 180 samples were collected and timely advisories were issued.



An AVA Scientist (left) conducts monitoring and sampling of plants at Gardens by the Bay.



Moth (or adult) of *Polydesma boarmoides*.



Larvae of *Polydesma boarmoides*.



Larvae of *Spodoptera picta*.



Nymph of *Thrips andrewsi*.

Soil Health

To build Singapore's capacity in soil management, a monitoring survey was initiated to establish the acceptable range of soil and leaf nutrients for common flowering ornamental plants in Singapore, such as *Lagerstroemia* (crepe myrtle) and *Canna* (Canna lily). The results will help AVA determine the health status of such plants and provide soil management recommendations.

Soil mixes are regularly used in landscaping works in the absence of good quality top soil. Landscape companies and other customers send samples of soil mixes and composts to AVA to check if they conform to specifications developed by National Parks Board's (NParks) Centre for Urban Greenery and Research (CUGE). Around 85 percent of soil mixes tested did not contain the required organic matter level. In addition, 40 percent of samples were found to contain less Cation Exchange Capacity (CEC), a property of soil which helps it to hold certain nutrients. Deviations from the specifications were highlighted to the customers for remedial action.

New Plant Pest/Host Records

AVA continues to strengthen our diagnostic capability and surveillance efforts. During the FY, AVA detected the presence of three new insect species in Singapore. Control measures were provided to the relevant stakeholders to manage these pests and monitoring efforts were continued to ensure minimal impact to the horticulture sector.

New Plant Pests & Hosts Detected in FY 2014

Pest	Host
<i>Polydesma boarmoides</i> (Monkeypod moth)	<i>Samanea saman</i> (rain trees)
<i>Spodoptera picta</i> (Lily army worm caterpillar)	<i>Crinum asiaticum</i> (spider lily), <i>C. pedunculatum</i> (swamp lily), <i>Clivia miniata</i> (bush lily), <i>Hymenocallis littoralis</i> (beach spider lily), and <i>Hippeastrum</i> sp. (amaryllis)
<i>Thrips andrewsi</i> (Rhododendron thrips)	<i>Alstonia angustiloba</i> (common pulai) and <i>Nelumbo</i> sp. (lotus)



Pest Risk Analysis

During the FY, AVA completed four risk assessments on genetically modified (GM) crops.

At the request of the Genetic Modification Advisory Committee Singapore, AVA completed the evaluation of imported transgenic Bayer Corn T-25, Soybean A5547-127, Monsanto corn-MON 87427, and Monsanto soybean-MON-87701 (to be used in animal feed) for altered pest susceptibility, weediness potential, and gene flow. Associated risk was deemed negligible in the field trial.

LABORATORY TESTING FOR PLANT HEALTH

As part of diagnostic services, a wide range of plant pests including insects, mites, fungi, bacteria, phytoplasmas, nematodes, and viruses are tested at AVA's Plant Health Laboratory (PHL). Analytical services are also provided for an extensive range of nutrients in soil, plant tissues, and planting media. The tests conducted at PHL range from morphological examination, biological indicators, and serological techniques, to advanced molecular and chemical/physical testing.



An AVA Scientist culturing a fungal pathogen in AVA's Plant Health Laboratory.

In FY 2014, PHL performed more than 26,000 tests and processed over 12,000 samples.

As part of efforts to expand PHL's testing capabilities, the following were successfully developed:

- DNA barcoding for identification of thrips. This technique was found to be suitable for identifying thrips species that were immature and dismembered.
- DNA barcoding of selected plant pathogenic fungi in Singapore. At least 35 different *Fusarium* isolates were successfully sequenced. The technique can be used to identify *Fusarium* and *Fusarium*-like species.

To build up our expertise in taxonomical identification, PHL produced the following references to enhance taxonomical identification:

- Pictorial morphological guide of insect pests in palm trees and major stored products.
- Electronic pictorial guide of common insect pests and plant nematodes in palms.
- Multimedia software for the identification of whiteflies.

Efficacy trials are conducted by PHL to keep abreast of new developments in the industry. This allows us to provide effective and updated recommendations on pest management when providing stakeholders with diagnostic services. During the FY, PHL conducted two efficacy trials and found that:

- Two pesticide formulations, i.e. Abamectin and Diazinon, were suitable and effective alternatives to Carbofuran, a nematicide with restricted use in Singapore.
- Two newly-registered pesticides were effective in controlling whitefly population on aquatic plants in a local farm.

PHL's work is underpinned by a commitment to constantly benchmark our systems against the ISO/IEC 17025 (2005) since 2006. During the FY, three new tests were accredited in the fields of chemical and biological testing under the Singapore Accreditation Council – Singapore Laboratory Accreditation Scheme (SAC-SINGLAS) in 2014. The Laboratory continued to meet all the requirements in the ISO/IEC 17025:2005 standards.

PHL also continued to benchmark its testing capabilities by participating in the inter-laboratory proficiency quality assurance testing programme administered by Wageningen Evaluating Programmes for Analytical Laboratories, the Netherlands. Consistently good performance was achieved in the programme. PHL's taxonomical identification expertise in fungi, insects, and nematodes was also benchmarked against the Commonwealth Agricultural Bureaux International (CABI) in UK, as well as other organisations in Australia and the USA with satisfactory results.



Treating tree wounds with fungal suspensions of *Trichoderma*.

RESEARCH COLLABORATION

AVA, NParks, and the National Institute of Education collaborated in a project to identify wood decay fungi from pruning wounds of common trees, as well as identify native strains of *Trichoderma* that could control these fungi. This project was completed in FY 2014.

The causal agents of wood decay on *Samanea saman* (rain tree) and *Khaya senegalensis* (mahogany) were identified through molecular identification. On assessing the bio-control performance of two liquid formulations of *Trichoderma* suspensions (water-based and hydrogel-based), it was found that wounds treated with these formulations had lower infection rates and smaller lesions. The formulations can potentially be used to manage wood decay fungi that result from pruning wounds of trees in Singapore. Related findings from this project were also published in the *Journal of Forest Pathology*.

PHL collaborated with Syngenta Asia Pacific Pte Ltd and the Housing & Development Board in a field trial to control caterpillar infestation in rain trees by injecting the trees with pesticide. Preliminary results indicated a reduction in the population of this pest.

In FY 2013, AVA collaborated with NParks to field-test the use of parasitic wasps (*Asecodes hispinarium* and *Tetrastichus brontispae*) for the control of hispid

beetles (*Brontispa longissima*) in palms. The release of these parasitic wasps was able to significantly reduce the population of hispid beetles in adult, larva, and pupa stages, in a sustainable and environment-friendly manner. These findings and related updates were published in a biology journal 'Life: The Excitement of Biology'.

EXTENSION SERVICES AND TRAINING

During the FY, AVA continued to conduct plant health assessments for commercial and residential establishments, such as Resorts World Sentosa, Gardens by the Bay, etc. Detailed recommendations based on laboratory and field analysis were made available for every assessment.

Regulating Pesticide Usage

To ensure food, environmental, and workers' safety, AVA registers and approves all agricultural pesticides for use in vegetable and ornamental plant farms. We conduct monthly pesticide usage inspections in farms to ensure that they comply with pesticide requirements under the Control of Plants Act. During inspections, samples of locally produced food crops are collected for pesticide residue and/or microbial testing. In FY 2014, 314 pesticide usage inspections were conducted on local plant farms, 217 samples were collected for laboratory tests, and 310 pesticide products were approved for agricultural use.



Students learning about plant health and bio-security at AVA's Plant Health Laboratory.



To ensure the safe use of pesticides in farms, AVA also certifies pesticide operators on the proper and safe application of pesticides in local farms. The number of AVA-certified pesticide operators totalled 182 at the end of FY 2014, as compared to 160 the year before.

In addition, Pesticide Operator Certification (POC) training and proficiency tests were conducted as part of the requirements for certification of competent pesticide operators in local farms. Four training courses (conducted in English and Mandarin) took place in June and December 2014 for existing and new POC applicants.

STAYING ALERT AGAINST EMERGING THREATS & ISSUES

AVA maintains its readiness to deal with pest incursions by testing and updating our contingency plans to combat outbreaks of plant diseases. We continue to detect plant pests early before their spread.

Singapore is a signatory to the International Plant Protection Convention (IPPC), an international plant health agreement that aims to protect cultivated and wild plants by preventing the introduction and spread of pests. IPPC member countries attend the annual Commission on Phytosanitary Measures to deliberate on issues and developments pertaining to the safeguarding of plant health and international trade in plants. In addition, regional workshops are organised for IPPC members to learn about the development of specific issues.

IPPC also develops International Standards for Phytosanitary Measures (ISPMs) that safeguard plant

resources. Member countries review the draft ISPMs before the standards are finalised. AVA provided comments on 10 drafts during the FY.

ENGAGING AND EDUCATING THE PUBLIC AND INDUSTRY

Our stakeholders play an important role in maintaining an effective bio-security continuum. Responsibility for plant bio-security in Singapore rests with the whole of the community, which includes the industry and public.

During the FY, AVA engaged the community through four Community-in-Bloom library talks. Students on learning journeys to the PHL had the opportunity to understand various aspects of plant health and bio-security.

In FY 2014, PHL continued to provide internships for students from tertiary institutions, which offered useful insights to the various aspects of work in the area of plant health.

Stakeholder engagement in FY 2014 was sustained through the production and dissemination of the monthly bulletin, 'Plant Health Brief', to the horticulture industry and members of the surveillance network to keep them updated on the latest pesticides and pest detections.

On 4 December 2014, PHL delivered a keynote presentation on the 'Importance of Using Registered Pesticides' at a landscaping workshop organised by an agriculture company, Syngenta.



Photo: Panasonic Factory Solutions Asia Pacific

AGROTECHNOLOGY



Local farms are encouraged to adopt technology to improve land-use efficiency and increase productivity. AVA conducts research and development on aquaculture, vegetable production, and post-harvest technologies, as well as provides technical advice to help our farms achieve better yields.



AGROTECHNOLOGY

Harnessing Technology to Optimise Singapore's Limited Resources

With limited space for farming and the aim to increase local production in key food items, as well as to maintain our competitive edge in the global orchid and ornamental fish markets, AVA harnesses life sciences and technology to optimise land use. Our technological developments are also shared with local farmers and overseas contract partners, to help them increase productivity and yield. In addition to working with farmers, AVA collaborates with institutes and manufacturers to develop innovative and value-added food products.

In 2014, our farms produced 12 percent of the leafy vegetables, eight percent of the fish and 25 percent of the eggs consumed in Singapore. /

FARMLAND MANAGEMENT

AVA developed six Agrotechnology Parks, equipped with modern infrastructure and facilities, to promote agrotechnology in Singapore. 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 31 March 2015, about 625 hectares of land in the Agrotechnology Parks were allocated to 235 farms. Another 36 hectares of land outside the Parks were allocated to 25 farms. These included layer farms for egg production, fish farms, vegetable farms, goat and cattle farms, orchid and floriculture farms, as well as ornamental fish farms. In addition, there were 117 coastal fish farms occupying 103 hectares of sea space on Singapore's coastal waters.

AVA continued to inspect farms regularly to ensure their compliance with regulations and conditions of lease agreement. AVA also worked closely with the National Environment Agency (NEA), Public Utilities Board (PUB), and other government agencies to investigate tip-offs on irregularities in AVA-licensed farms. Such irregularities include the presence of illegal structures and unauthorised activities at farm premises.

In FY 2014, AVA conducted 8,499 surveillance and inspection visits at animal and plant/vegetable farms to check for irregularities. A total of 45 enforcement actions were taken against farms that were found to be non-compliant.

TECHNOLOGY DEVELOPMENT AND TRANSFER

Research And Development (R&D) is vital in our efforts to increase agricultural productivity, local production, and competitiveness. To improve the 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, as well as post-harvest technology.

R&D IN AQUACULTURE

R&D in marine aquaculture is carried out at AVA's Marine Aquaculture Centre, while freshwater aquaculture R&D is done at Sembawang Research Station. AVA also provides technical assistance and services to the aquaculture industry to help them increase productivity.

Located on St John's Island, the Marine Aquaculture Centre was established to undertake tropical marine food fish aquaculture technology development. During the year, the Marine Aquaculture Centre continued to develop fast-growing and good quality fish fry for intensive farming.

Selective Breeding Project

In 2009, AVA began collaborating with Temasek Life Sciences Laboratory (TLL) on a marker-assisted selective breeding project, which uses genomic tools to generate superior Asian seabass (*Lates calcarifer*) and saline-tolerant Mozambique tilapia (*Oreochromis*



At AVA's Marine Aquaculture Centre, where superior seabass lines are developed.

mossambicus). The project was completed in December 2014, with faster growth rates achieved for seabass (by 30%) and tilapia (by 15%).

In another joint project, both parties worked on further improving the seabass and tilapia lines to generate even faster growers, and on developing breeding lines for other traits, such as disease-resistance and higher omega-3 value. This project is expected to conclude in 2017.

Public-Private Co-Innovation Partnership Project to Develop Closed Containment Aquaculture System

Through a Public-Private Co-Innovation Partnership Project, AVA sought tender proposals for the development of Closed Containment Aquaculture (CCA) systems that would be effective in mitigating the adverse impact of environmental conditions on local coastal fish farms. Following an assessment of the proposals submitted, the tender was awarded to five companies, which have begun working on suitable CCA systems, with targeted completion in September 2015.

Aquaponics Project

During the FY, AVA initiated a study to investigate the commercial viability of aquaponic farming (a combination of hydroponics and recirculating aquaculture systems) in Singapore. A prototype that integrated fish and vegetable farming was developed at the Marine Aquaculture Centre, and its commercial scalability is being tested. The study is expected to be completed by the end of FY 2015.



The aquaponic prototype at AVA's Marine Aquaculture Centre is currently undergoing tests for commercial scalability.



With AVA's assistance, a recirculation aquaculture system was set up at a local fish farm.

TECHNICAL ASSISTANCE AND SERVICES

To facilitate the development of Singapore's food fish and ornamental fish industries, AVA's Aquaculture Services Centre at Sembawang Research Station provides technical advice to stakeholders, viz. investors, farmers, and exporters.

In FY 2014, AVA made over 500 site visits to food fish and ornamental fish farms. During these site visits, AVA continued to provide advisory services in areas such as good farm practices and fish health management. We worked closely with local fish hatcheries to optimise existing methods and assisted farms to increase their productivity in both live-feed and fish fry productions. On-site training sessions were also conducted for the farmers.

During the FY, to help farmers achieve better control over water quality and enhance bio-security in farms, AVA assisted them to establish recirculation aquaculture systems, as well as develop effective water treatment systems through the use of ozone-disinfection technology.

To encourage the use of automation to raise farm productivity, AVA actively introduces suitable technology for adoption by the industry. In November 2014, AVA conducted a technical workshop for local hatcheries and demonstrated the use of an automated fish grading system that can sort up to 50,000 fish fry within an hour (as compared to at least six hours by manual labour). Participants were keen to adopt this



Technical demonstration of an automatic fish grading system at a local fish farm.

system, which also integrates three work processes into one seamless workflow: transfer of fish using a fish pump, mechanised sorting of fish fry, and counting of fish using sensors.

Besides assistance for food fish farmers, AVA also supported the Ornamental Fish Business Cluster (OFBC) in the publication of a newsletter during the FY. The newsletter shares essential knowledge on ornamental fish farming, such as good bio-security management, as well as disease recognition, diagnosis, and prevention.

On 31 July 2014, an OFBC Seminar on 'Embracing New Technology for Better Productivity' was held to encourage exporters and farmers in the industry to stay competitive by leveraging technology.

R&D IN HORTICULTURE

Horticulture R&D is carried out at AVA's Sembawang Research Station, as well as in collaboration with the commercial sector and research institutions.

During the FY, AVA embarked on R&D projects with the aim of helping local farmers increase vegetable yield and process efficiency through the use of technology. These projects cover farming systems; seedling production and transplanting; irrigation management; plant treatment systems; identification of vegetable varieties that are tolerant to low-intensity light, as well as an electronic application to measure vegetable growth.

Indoor Vegetable Farming

Indoor vegetable farming enables consistent year-round production regardless of weather conditions. It is recognised as a potential solution to food security in the face of climate change. Since FY 2011, AVA has been studying the effect of artificial lightings – LED and fluorescent – on *xiao bai cai*.

In FY 2014, our studies showed that artificial lightings were effective for growing *xiao bai cai* indoors. With the right amount and duration of exposure to these lightings, the weights of plants grown indoors can be on par or higher than those grown in greenhouses. In addition, we tested the effect of different lighting durations (using cool/warm fluorescent lighting) on the cultivation of lettuce. Yield was the lowest when light duration was 10 hours and there was no significant difference in yield among the remaining light treatments.

Multi-tier Seedling Production System

In 2014, AVA developed an automatic prototype of an indoor multi-tier seedling production system that has the potential to increase seedling production by at least four times per unit area and reduce water usage by 90 percent. The age of seedlings ready for transplanting could also be lowered by 30 percent as compared to conventional seedling production. Low-cost fluorescent tubes that last up to four years were used as an economical option. Moreover, the prototype can be used to grow baby leafy vegetables and can be adapted to both substrate and water culture.

The system was demonstrated to 12 industry stakeholders, some of whom adapted the technology to suit their needs. AVA will continue to conduct more demonstrations and provide technical advisory to those interested to adopt the multi-tier seedling production system.



AVA's multi-tier seedling production system prototype has the potential to increase seedling production by at least four times per unit area and reduce water usage by 90 percent.





Xiao bai cai irrigated using different types of overhead sprinklers.

Mechanical Vegetable Seedling Transplanter

Transplanting is one of the more laborious processes in vegetable farming. Since 2014, AVA has been collaborating with the Nanyang Technological University (NTU)'s School of Mechanical & Aerospace Engineering (MAE) to develop a prototype of a mechanical vegetable seedling transplanter.

MAE worked in close consultation with AVA and local farmers to develop a prototype design that can potentially reduce man-hours by fivefold and operate within limited land space of local farms.

The prototype has been constructed, and is currently undergoing test-bedding and fine-tuning with expected completion by 2016. Several farmers have indicated interest to purchase the transplanter when it is commercialised.

Irrigation Management

In March 2014, AVA conducted trials – with local farms and a community garden – on the use of a low-cost overhead sprinkler system that consumes less water without affecting crop yields. When compared to irrigation by previously existing overhead sprinkler systems, 26 percent less water usage was observed, and there was no significant difference in crop yields. AVA plans to introduce this irrigation system to more farms and community gardens.

Bio-char as Alternative Basal Fertiliser

In November 2013, AVA began a study on bio-char (an organic compound derived from plants and animal waste), as an alternative basal fertiliser to chicken manure. Since then, trials had been conducted to compare growth performances of *xiao bai cai* in soil containing chicken manure versus bio-char. Results showed that bio-char is an effective alternative to the commonly used chicken manure.



Bio-char is found to be an effective alternative to chicken manure as a fertiliser for xiao bai cai.

Study on Efficacy of Fertilisers

AVA conducted studies to evaluate the efficacy of fertilisers, with the aim to help vegetable farmers increase productivity. *Xiao bai cai* yields increased by 25 percent when high-phosphorus starter solution was applied at the transplanting stage. When high-potassium fertiliser was applied, yields were 18 percent higher than the control that used high-nitrogen fertiliser. Joint trials with farmers will be carried out to test this method of fertilising.



Aquatic Plant Treatment System

AVA is working with PUB to develop a cost effective treatment system that aids in the management of pond water quality in vegetable farms. One area of study investigates how nitrates and phosphates in the pond water could be recycled and reused in the cultivation of vegetables.



A trial to test the growth of watercress and mint in an aquatic treatment system.

Drip 'Fertigation' Farm Trial

AVA and a local farm are jointly testing out a drip 'fertigation' system to maximise the growth of vegetables on cocopeat (non-soil) substrate. This form of cultivation not only allows growing without soil, it also uses less water and enables a degree of automation in fertilising through the drip irrigation system.



The drip fertigation system uses less water and enables a degree of automation in fertilising through the drip irrigation system.

The trial involved growing *xiao bai cai* in trays of cocopeat in a greenhouse with a PVC roof and nets on the sides. Vegetables were 'fertigated' thrice daily for 38 days and those grown in soil-beds served as control. Results demonstrated that the crop cultivated in cocopeat had higher yields (by 44%), soluble solids (by 9%), number of leaves (by 26%), leaf area (by 27%), and plant length (by 6%), than the control grown in soil beds. Crop uniformity was satisfactory. Laboratory analysis showed that nutrient content in the vegetables was comparable to healthy *xiao bai cai*. The trial showed that good yields and quality of vegetables could be achieved with cocopeat cultivation.

Exposure of Leafy Vegetables to Low-intensity Light

AVA conducted trials to study the effects of extending the growth duration of six *xiao bai cai* varieties from 30 to 38 days under low-intensity light. The *xiao bai cai* varieties were grown in a greenhouse with a PVC roof and nets on the sides, and were subjected to 20 percent and 60 percent shading; crop grown without shade served as control.

On the 30th day, all six varieties exhibited poor growth especially in the crops grown under 60 percent shading. However, on the 38th day, plants grown under 60 percent shading caught up on growth rates. Their weight increased by about 56 percent and yields were comparable to those grown for 30 days without shading.

A sensory evaluation was also conducted to assess the taste, sight, smell, and texture of 30- and 38-day old vegetables. Results indicated that all 38-day old vegetables were acceptable and comparable to 30-day old vegetables, although the latter achieved marginally higher scores in the sensory evaluation.

The study showed that despite lower light conditions, yields and marketable quality of these *xiao bai cai* varieties could be maintained by extending growth duration.

Mobile Application for Rapid Measurement of Vegetables and Identification of Pests

AVA collaborated with the Centre of Social Media Innovations for Communities (COSMIC) from the National University of Singapore (NUS) to develop a mobile application to measure the growth performance of vegetables. Using this application, the time required to assess treatment effects during vegetable experimental trials was reduced by 66 percent. Development of the mobile application was completed in FY 2014 and AVA will be introducing the application to farmers and community growers.

Facilitating Protection of Plant Varieties

Under the Plant Varieties Protection (PVP) Act, a breeder who discovers and develops a new plant variety may apply to protect his intellectual property. On 30 July 2004, Singapore acceded to the International Union for the Protection of New Varieties of Plants (UPOV) and offered PVP for 16 plant genera and species. In July 2014, Singapore expanded the scope of this protection to all plants. The legislation was also amended to allow parties other than AVA to be appointed as an examination authority for PVP.



Emeritus Senior Minister Mr Goh Chok Tong and Minister of State for National Development and Defence Dr Mohamad Maliki Bin Osman at the Marine Crescent Ville Community Garden.

During the FY, a local research company applied for PVP for two new *Jatropha curcus* varieties. These varieties are undergoing a technical examination by AVA.

AVA also led the development of guidelines on the evaluation of new orchid varieties in the region. With the consensus of participating countries such as Japan, Malaysia, and Thailand, evaluation guidelines for the orchid genus *Dendrobium* was completed in 2015.

Enhancing Vegetable Production in Community Gardens

In FY 2014, AVA, together with People's Association, organised the first community farmers' market in Singapore, where more than 250kg of vegetables were harvested for sale. The proceeds of more than \$6,000 were donated to Man Fu Tong Nursing Home.

In celebration of World Food Day that falls on 16 October annually, AVA taught gardeners at the Marine Crescent Ville Community Garden the ways to improve their vegetable growing skills. During the training period from 13 September to 11 October 2014, AVA also introduced new plant varieties for the gardeners to grow.

Emeritus Senior Minister Mr Goh Chok Tong, together with Minister of State for National Development and Defence Dr Mohamad Maliki Bin Osman, harvested vegetables from the community garden on 11 October 2014 and presented the produce to Foo Hai Elderly Lodge residents.

In FY 2014, AVA reached out to 17 community gardens and five schools through vegetable growing advisory services and talks on growing edible plants.

To help community gardeners further improve their skills in growing edible plants, AVA initiated a Master Growers programme in February 2015. Under this programme, we aim to build up a pool of skilled volunteer who can train other community gardeners on vegetable growing.

R&D IN POST-HARVEST

To promote an innovative, integrated, and sustainable food supply chain, AVA's Post-harvest Technology Centre (PHTC) embraces technological innovations to create value-added products, minimise food loss, and recycle food waste. Our applied research and extension services focus on optimising post-harvest

processes and management to reduce farm waste and develop value-added products; and improving the efficiency of the food supply chain.

In FY 2014, AVA continued to engage research institutes and industry stakeholders in developing or adopting innovative products and processes; improving product quality and shelf life; adding value to by-products from food processing; implementing best practices to minimise food loss and waste; and optimising productivity along the food supply chain.

Okara in Poultry Feed

During the FY, AVA collaborated with NTU to transform okara, a by-product of soy milk manufacturing, into an ingredient in nutritious poultry feed. Food grade microbes were used to ferment and enhance the digestibility of okara protein.

Results from laboratory studies showed an enhanced digestibility of okara using mono-cultured food grade microbes. Trials on mix-culture fermentation will be conducted in FY 2015 to further enhance okara's nutritional profile.

Encasing Technique for Semi-moist Fish Feed

In FY 2013, AVA in collaboration with Apollo Aquarium Pte Ltd developed a type of semi-moist feed that is partially derived from fish trimmings. A new processing protocol using an encasing technique was developed to minimise the leaching of semi-moist feed nutrients into the water during feeding. This technique, which wraps the semi-moist feed in edible bio-secured casings, provides farmers with greater flexibility to adjust the feed formulation at different growth stages of the fish. AVA shared this encasing technique with 41 food-fish farmers through a workshop and demonstration session on 23 May 2014.



Food fish farmers learning about the encasing technique for semi-moist feed derived from fish trimmings, in a workshop and demonstration session organised by AVA.

Development of High Value Food from Fish Trimmings

During the process of filleting mullets, edible fats (approximately 10 percent of the fish mass) are discarded. AVA is working with a local mullet farm to recycle these mullet fats, and develop products rich in omega-3 fatty acids. Research outcomes will be shared with stakeholders from the aquaculture and food industries.



Mullet fats converted into fish crackers.

Preservation Technology for Ready-to-eat Hard-boiled Eggs

In FY 2014, AVA completed a research study on the processing conditions that doubled the shelf-life of ready-to-eat hard-boiled eggs to 30 days. A technical brochure was produced and will be distributed to the egg industry and foodservice sector.

Efficient and Safe Processing Protocols for Ready-to-eat and Ready-to-cook Vegetables

With increasing demand for Ready-to-Eat and Ready-to-Cook (RTC) food, local food establishments have sought AVA's technical assistance in developing efficient and safe processing protocols for these fresh produce. In response, AVA developed processing protocols for RTC bell peppers and cucumbers, which will be shared with the industry through a seminar and technical publication in FY 2015.

Sanitation Treatment for Turnip

To reduce potential microbial contamination in ready-to-eat turnips, AVA collaborated with NUS to assess the effectiveness of various sanitizer treatments.

The research study concluded that acidified sodium chlorite was effective in reducing natural microflora and *Salmonella* spp. in shredded turnips without causing deterioration in quality. A shelf-life of up to nine days under aerobic conditions at 4°C was also achieved. These results will be shared with the industry in FY 2015.



Light-emitting Diode for Food Preservation

To develop a non-chemical food preservation technique, AVA and NUS embarked on a three-year research collaboration in FY 2012 to investigate the effects of light-emitting diode (LED) light treatments on the quality and nutritional values of post-harvest fresh vegetables.

In FY 2014, experimental trials on fresh-cut spinach were completed. Results showed that LED illumination had anti-bacterial effect on several food borne pathogens when a buffer solution (that controls pH levels) was used. Data also suggested that storing minimally processed spinach under LED illumination at 4°C may lead to modest increases in vitamin C. Experimental trials for butterhead lettuce have started and will continue in FY 2015.

Use of Modified Atmosphere Packaging to Extend Shelf-life of Chilled Fillets

In FY 2013, AVA and ITE College East collaborated to establish the optimum gas composition for Modified Atmosphere Packaging (MAP) of threadfin fish fillets. As a result, we successfully extended the shelf-life of chilled threadfin fish fillets from three days to 10 days. In FY 2014, trials were conducted to determine the best material to use for MAP. A commercial scale-up trial was conducted at a local seafood processing establishment.



Fish fillet being packed in modified atmosphere packaging.

Sensory evaluations were also conducted on chilled threadfin fillets packed in MAP versus those not packed in MAP. Participants preferred the latter, although fillets packed in MAP demonstrated better microbiological quality.

Nano-technology Application in Food Packaging

In FY 2014, AVA signed a tripartite research agreement with the Institute of Materials Research and Engineering and Piaget Chemicals & Manufacturing Pte Ltd to test-bed a nano-composite packaging that possesses barrier properties against oxygen, moisture, and UV. These barrier properties can help to improve the shelf-life of food products and reduce food waste due to spoilage.

Local meat manufacturers indicated strong interest to use this packaging to improve the shelf-life of chilled poultry, pork, beef, and value-added meat products.

Stick-on Sensor for Fruit Ripeness

In FY 2012, AVA worked with Ngee Ann Polytechnic's Water Technology Centre of Innovation and a retailer to develop a non-invasive and cost-effective membrane sensor from nano-fibres to easily determine fruit ripeness. We aim to help retailers to better monitor fruit ripeness, so that timely and informed decisions can be made on fruit delivery to reduce post-harvest losses.

In FY 2014, the sensor was successfully tested on Thai mangoes and the New Zealand kiwis with good results. Fruit ripeness could be determined immediately through colours indicated on the sensor, eliminating the need for traditionally invasive methods to measure firmness, sugar content (brix), acid content, aromas, and vitamins.

Future research will look into further improving the time taken by the sensor to detect fruit ripeness. A database on ripening durations for different fruits will also be developed for use in future projects on the shelf-life extension of fruits.

Eco-friendly Processing Protocol for Surimi-based Products

Local surimi processing plants traditionally use large amounts of water at the gel-setting and cooking stages of production. AVA and ITE College East jointly developed a modified processing protocol for surimi-based products. In FY 2014, the protocol, which reduces the loss of nutrients or ingredients and minimises water usage, was shared with local fish ball manufacturers.

Good Handling Practices for Live, Chilled, and Frozen Seafood

In FY 2014, AVA conducted trials to determine the optimum processing techniques and storage practices for live, chilled, and frozen seafood, after analysing the gaps in the supply chain of these commodities. These findings, along with seafood quality indexes, as well as information on technologies that ensure the safety and quality of seafood, will be incorporated into a Good Handling Practices handbook for publication in FY 2015.

Good Manufacturing and Hygiene Practices for Sushi and Sashimi

To promote self-regulation in food quality assurance along the supply chain, AVA and NEA embarked on a partnership in FY 2013 to develop a reference guide for Good Manufacturing and Hygiene Practices for Sushi and Sashimi. In FY 2014, sushi and sashimi along the supply chain of a local company were sampled for microbiological testing. These test results will enable AVA and NEA to determine the current standard of handling practices and formulate guidelines for best practices to improve microbiological quality control.

Technical Assistance and Advisory Services for Post-harvest Industry

To upgrade the agri-food industry's competence in post-harvest processing, AVA provides extension services to stakeholders such as farmers, processors, traders, and retailers. These services include consultancy and training in the areas of post-harvest handling techniques, cold chain management, food quality assessment and preservation, and food safety assurance/management.

Good Handling Practices for Vegetable Packing Houses

In 2013, AVA, together with SPRING and the food industry, jointly developed a new Singapore Standard (SS) for the cold chain management of vegetables. In FY 2014, AVA published a handbook on 'Good Handling Practices in Packing House for Vegetables' to facilitate the adoption of the SS. The handbook helps stakeholders to implement best practices in their packing houses.

Training and Extension Services for Local Meat Industry

In November 2014, AVA engaged five experts from Brazil and Denmark to share insights on the trends, advanced approaches, and technical solutions in meat processing and quality assurance. The sharing session was organised as part of efforts to upgrade the technical skills and capabilities of Singapore's meat industry and address the challenges faced by local processors and retailers.



An expert answering questions on meat processing and quality assurance during a sharing session organised by AVA.

MANPOWER DEVELOPMENT FOR THE AGRI-TECHNOLOGY SECTOR

Farmers in Singapore continue to face challenges in recruiting local and foreign workers to build their manpower capacity and meet rising demand.

To reduce over-reliance on foreign workers and to ease manpower demand, AVA assists the industry to adopt modern agricultural technologies, automation, and highly productive solutions through the Agriculture Productivity Fund (APF).

MARKET-BASED SKILLS FRAMEWORK FOR THE AGRI-TECHNOLOGY SECTOR

In July 2013, the Ministry of Manpower introduced a Market-Based Skills Framework that allows Work Permit Holders (WPHs) in the Agri-technology sector to upgrade from the 'Unskilled' (R2) to 'Skilled' (R1) status.

AVA-licensed farms employing WPHs earning a monthly salary of at least \$1,600, and with at least four years of working experience in Singapore, will be granted the R1 status. Such skilled workers will attract a lower foreign worker levy and be allowed a maximum employment period of 18 years.

COMMUNITY OUTREACH

Besides working with the industry on technology development and transfer, AVA also reaches out to the public through community events and learning journeys to showcase our efforts in harnessing technology to optimise Singapore's resources.

LEARNING JOURNEYS

AVA hosts students and teachers on learning journeys to the Marine Aquaculture Centre and our agrotechnology parks. In the FY, we hosted one learning journey for 27 students and adults to the Marine Aquaculture Centre, and another three learning journeys for 160 students to agrotechnology parks.

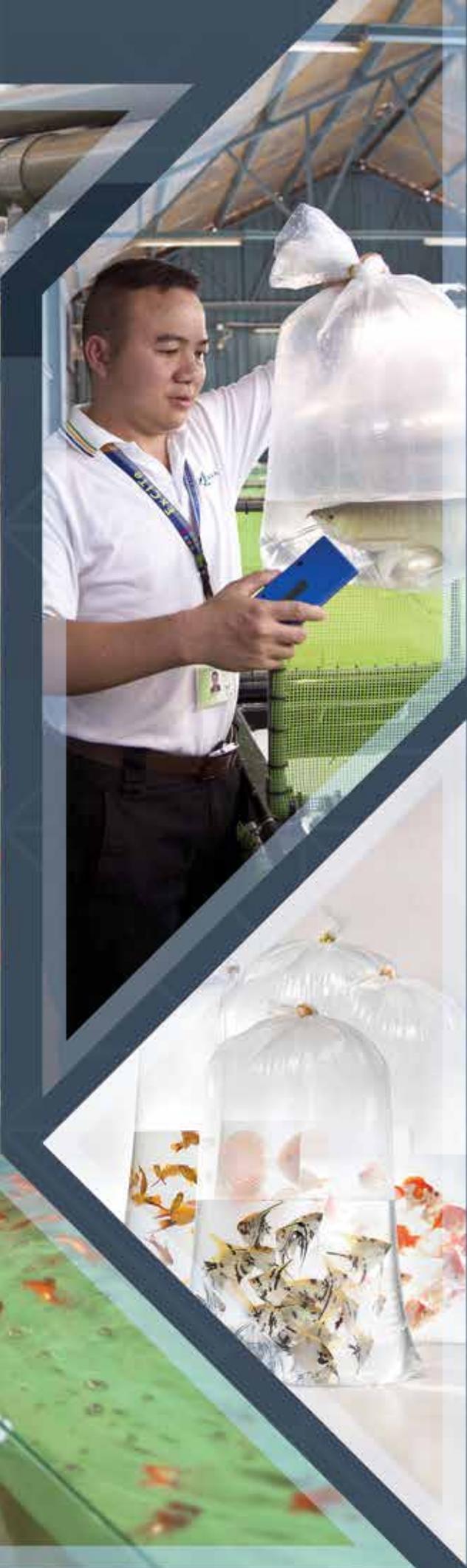




AGRI-TRADE



Singapore is a major exporter of ornamental fish and orchids. At the same time, we import most of our food. To support the import and export of agri-food products, AVA keeps abreast of developments around the world and forges international partnerships.

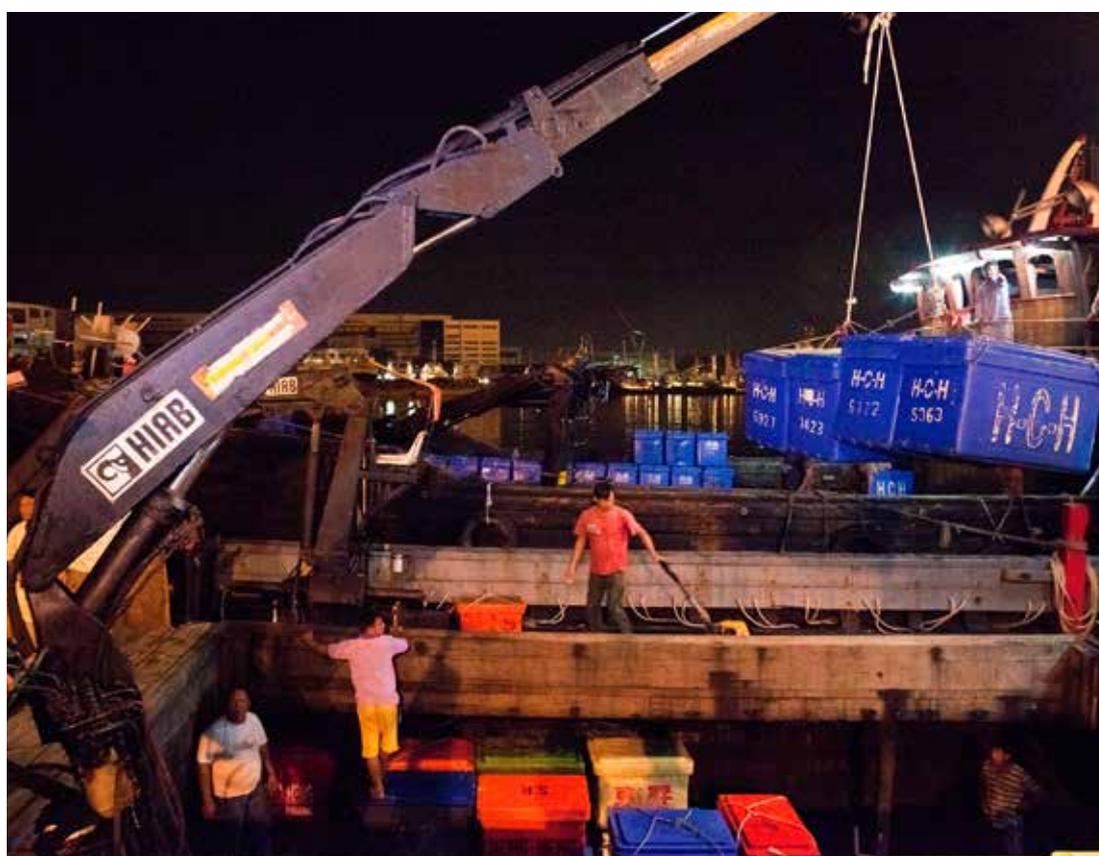




AGRI-TRADE

Facilitating Agri-trade for Food, Plants, and Ornamental Fishes

AVA continues to facilitate free trade and maintain close ties with the global community in the spirit of exchange and cooperation. Besides facilitating trade, AVA also regulates the import and export of endangered species.



More than 50,000 tonnes of fish from foreign fishing vessels, local fish farms, as well as imports via land and air, were handled at the Jurong Fishery Port in FY 2014.

FACILITATING IMPORTS

JURONG AND SENOKO FISHERY PORTS

AVA manages the Jurong and Senoko fishery ports, which serve as wholesale and distribution centres for both locally produced and imported seafood of all forms (live, chilled, and frozen) in Singapore. During the FY, the top five fish exporting countries to Singapore were Malaysia, Indonesia, Thailand, Norway, and India.

The Jurong Fishery Port (JFP) serves as an international port of call for foreign-flagged fishing vessels and fish carrier vessels. In FY 2014, a total of 2,616 vessel calls were made at JFP. Some 50,210 tonnes of fish from foreign fishing vessels, local fish farms, as well as imports via land and air, were handled during the FY. Of these, 1,050 tonnes were tuna imports meant for re-export.

Senoko Fishery Port (SFP) continues to serve as the hub for local fishing vessels. In FY 2014, a total of 1,973 vessel calls were made at SFP. Fish merchants operating in SFP handled about 7,023 tonnes of fish from local fishing vessels, local fish farms (land and sea), as well as from imports.

FACILITATING EXPORTS

AVA facilitates the export of food, plants, and their products, as well as ornamental fishes, animals, and animal products, by issuing internationally recognised certificates and permits. In addition, we help further upgrade the export capabilities of our industries by engaging them in collaborations and dialogues.

FOOD PRODUCTS

Export Certification Services

AVA facilitates the export of meat, fish, as well as dairy and processed food products by providing export inspection and certification services to the food industry. In FY 2014, AVA issued 14,865 Export Health Certificates and Free Sale Certificates to local exporters. AVA will also continue to work with stakeholders and overseas counterparts to facilitate the export and transhipment of food products through Singapore to overseas.

New Export Standards

Besides certification services, AVA also facilitate exporters in meeting new requirements imposed by importing countries.

Starting 1 July 2013, countries exporting foodstuff of plant origin to Vietnam must be approved by Vietnam's National Agro-Forestry-Fisheries Quality Assurance Department (NAFIQAD). AVA submitted the relevant documents for NAFIQAD's evaluation, and subsequently obtained approval for Singapore to resume exporting foodstuff of plant origin to Vietnam.



To facilitate food export, an AVA officer conducts export inspection and sampling to ensure requirements of the destination country are met.



Singapore was approved to export infant formula and general milk products to China after meeting new requirements imposed by the China Certification and Accreditation Administration.

With effect from 1 May 2014, all manufacturers exporting dairy products to China must be pre-registered with the China Certification and Accreditation Administration (CNCA) and meet all of China's requirements. AVA worked with Singapore's exporters and CNCA on the registration process, which included the submission of country and establishment dossiers. Following CNCA's on-site audit in Singapore, which included visits to AVA and four local dairy manufacturers, Singapore was approved to export infant formula and general milk products to China. At the end of the FY, there were six Singapore manufacturers approved by and registered with CNCA.

In addition, AVA facilitated the successful registration and approval of establishments in Singapore – to export fishery, meat, and dairy products to China, Vietnam, and the European Union (EU), respectively.



ORNAMENTAL FISH

In FY 2014, Singapore exported approximately \$66.1 million worth of ornamental fishes to over 80 countries. The major countries included EU member states, the USA, Japan, and Canada.



Singapore exported more than \$66 million worth of ornamental fishes in FY 2014.

AVA regulates and facilitates the ornamental fish trade by issuing import and export permits, as well as health certificates for all live fish exports. In FY 2014, our certificates continued to be accepted internationally, with a total of 7,913 health certificates issued to accompany live fish consignments exported from Singapore to various parts of the world. AVA continues to work with our trading partners to ensure that their export certification requirements are met.

ANIMALS AND ANIMAL PRODUCTS

AVA is the national authority responsible for issuing certificates and permits that meet importing countries' requirements. These documents help to facilitate the export of live animals, animal feed, and animal products. In FY 2014, a total of 4,491 Veterinary Health Certificates, 2,686 export permits, and 1,012 Certificates for Freedom from Disease were issued. A total of 437 Free Sale Certificates were also issued to facilitate the export of animal feed, products, and vaccines.

AVA has been audited by New Zealand Ministry for Primary Industries (MPI) to export horses to New Zealand. The first shipment of horses to New Zealand took place on 26 March 2015. AVA is working with MPI to further refine the export procedures for future trade.

PLANT AND PLANT PRODUCTS

AVA is the national authority for the phytosanitary certification of plants and plant products for export. We facilitate the export of plant products by ensuring that the plant health requirements of importing countries are met. Singapore is a signatory to the International Plant Protection Convention (IPPC) and we abide by the international standards set by IPPC and align our procedures with those standards.



AVA facilitated more than \$1 billion worth of agri-trade through the issuance of phytosanitary certificates in FY 2014.

In FY 2014, AVA facilitated about \$1.1 billion worth of agri-trade through the issuance of 12,078 phytosanitary certificates. Our phytosanitary certificates were recognised by 124 countries and the top export destinations were Indonesia, Japan, Australia, China, Malaysia, the UK, Germany, East Timor, India, and Brunei Darussalam.

AVA participated in the Singapore Gardens Festival (SGF) 2014 at Gardens by the Bay. We facilitated the clearance of imported consignments and issuance of phytosanitary certificates for visitors to SGF by conducting post-entry inspections and issuing phytosanitary certificates on-site. AVA also provided support for the Orchid Business Cluster's (OBC) participation in the Table Top Floral Display Competition (Professional Category) at SGF. The competition helped raised the awareness of OBC and Singapore's orchid industry.

Assurance Certification Scheme

As at the end of FY 2014, a total of 10 companies were accredited under AVA's Assurance Certification Scheme (ACS), of which, four were for aquatic plants, four for cut flowers and cut foliages, one for tobacco, and one for cocoa products. AVA conducts compliance audits on ACS-accredited exporters to ensure that standards were upheld for the export of aquarium plants, cut flowers, foliages, and plants that require phytosanitary certification.

ACS-accredited exporters are also required to send their staff for training and certification for proficiency in inspection and identification of pests. During the FY, inspectors from two companies were trained and certified by AVA.

To comply with EU's import requirements, two ACS-accredited exporters of aquatic plants built netted structures in their farms to establish a Pest Free Product site to ensure that aquatic plants exported to EU are free from whitefly, *Bemisia tabaci*, a pest of quarantine concern in EU. AVA also stepped up its weekly farm monitoring for the pest.

Treatment Provider Scheme

The Treatment Provider Scheme (TPS) is a voluntary scheme that accredits providers who carry out phytosanitary treatments for export certification. During FY 2014, six new companies were accredited under TPS, raising the number of TPS members from 49 to 55.

Members of the scheme are subject to regular compliance audits conducted by AVA. No major or critical non-compliance was observed during these audits.

ENGAGING STAKEHOLDERS

AVA works closely with our stakeholders to facilitate agri-trade. We engage and collaborate with our industries through Business Cluster activities and dialogue sessions.

ORNAMENTAL FISH BUSINESS CLUSTER

Initiated by AVA in 2003, the Ornamental Fish Business Cluster (OFBC) has been instrumental in addressing the challenges and charting new directions for the industry, as well as in raising the international profile of Singapore's ornamental fish industry. With key representation from industry associations, exporters, breeders, and associated companies, the OFBC will continue to reinforce Singapore's position as an ornamental fish hub.

AVA also engaged industry players outside of the OFBC. Two dialogue sessions with licensed ornamental fish traders were conducted between July and November 2014 to keep the industry abreast of industry developments and regulatory changes.

ORCHID BUSINESS CLUSTER

The Orchid Business Cluster (OBC) was established in May 2003 to bring together the resources of Singapore's exporters and growers, in order to strengthen Singapore's position as a world-renowned exporter of tropical orchids. It also aims to move the industry forward in today's rapidly changing business climate. The OBC comprises representatives from various key floriculture associations and growers, as well as representatives from government agencies such as International Enterprise (IE) Singapore, NParks, and AVA.

Following dialogues and meetings held in the FY, the cluster identified some key areas of work to advance the orchid industry and foster greater collaboration among members.

TRADE IN ENDANGERED SPECIES

AVA is the national authority for the implementation and enforcement of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which aims to prevent over-exploitation of endangered animals and plants.

In FY 2014, AVA issued a total of 11,767 CITES permits and certificates to regulate wildlife trade, which comprised mainly of reptile skins and reptile manufactured products, Asian arowanas, pet birds, and agarwood. AVA also facilitated the commercial re-export of wildlife not categorised under CITES, through the issuance of 505 Non-CITES certificates/'B' statements.

During the FY, AVA investigated 18 cases of illegal trade of wildlife, as well as possession and sale of illegal wildlife. Of these cases, two were prosecuted in court, nine were compounded with fines between \$50 and \$1,500, and one was issued with an advisory.

In April 2014, following a tip-off, AVA officers investigated an aquarium shop that sold a variety of illegal endangered animals, including sturgeons, paddlefishes, clawed frogs, newts, short-necked turtles, and tortoises. The aquarium shop owner was prosecuted in court and fined \$41,000 for the illegal possession and sale.

In January 2015, aviation screening officers detected the smuggling of 190 black pond turtles. The offender was arrested and jailed 16 months.



Critically endangered black pond turtles (Geoclemys hamiltonii) listed under CITES.





AVA Director-General for Agri-Food & Veterinary Services Dr Chew Siang Thai (seated, 5th from right) with AVA officers and ASEAN representatives at the 22nd ASEAN Sectoral Working Group on Livestock meeting.

INTERNATIONAL RELATIONS

By participating in bilateral, international, and regional 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

The AVA-DVS (Department of Veterinary Services, Malaysia) Bilateral Meeting was held on 7 April 2014 in Malaysia. Both parties agreed to establish bilateral working groups to address issues on cross-border animal movement; export of Malaysia's meat-based products to Singapore for the Agro Bazaar (a farmers' market featuring Malaysian produce in Singapore); laboratory diagnostics; and areas of research collaboration.

AVA attended the 18th Singapore-Malaysia Bilateral Meeting on Agriculture in Malaysia on 30 September and 1 October 2014. The meeting resulted in positive outcomes for issues on food safety of fresh produce, as well as on safeguarding of plant health in the region. The two taskforces formed will continue to work on relevant issues in collaboration with Malaysian counterparts.

AVA attended the 10th Singapore-Vietnam Connectivity Ministerial Meeting (CMM) held in Singapore on 29 April 2014. During the meeting, Vietnam proposed ways to increase agri-food exports to Singapore via agricultural investments and by assisting Vietnamese small and medium-sized enterprises (SMEs) to participate in promotional events in Singapore. AVA and IE Singapore are working on these suggestions.

Following the Singapore-Vietnam CMM, AVA hosted a delegation from Vietnam led by Mr Le An Hai, Deputy Director General of Asia Pacific Market Department, Ministry of Industry and Trade, on 8 October 2014. The objectives of the visit were to attract agriculture investment into Vietnam and increase the exports of Vietnamese agriculture and seafood products to Singapore. Market insights were exchanged and a business matching session was also organised.

AVA hosted the 10th meeting of the Indonesia-Singapore Agri-business Working Group (AWG) on 26 November 2014 in Singapore. The AWG reviewed the action plans to further improve the export volume of agri-products from Indonesia to Singapore.

INTERNATIONAL AND REGIONAL COLLABORATION

In FY 2014, AVA continued to participate actively in ASEAN, and APEC (Asia-Pacific Economic Cooperation) meetings and projects, as well as other international forums. AVA participated in several high level international meetings to discuss cooperation in areas such as food security, food safety, fisheries, livestock, crops, sanitary, and phytosanitary measures.

8th ACCAHZ PrepCom, 22nd ASWGL, and 1st ANFPVP Meetings

AVA hosted three ASEAN meetings – ASEAN Coordinating Centre for Animal Health and Zoonoses (ACCAHZ) Preparatory Committee (PrepCom); ASEAN Sectoral Working Group on Livestock (ASWGL); and ASEAN National Focal Points on Veterinary Products (ANFPVP) – in Singapore from 4 to 9 May 2014.

Singapore served as the Chair country for the 22nd ASWGL and 1st ANFPVP meetings, and as the Vice-Chair country for the 8th ACCAHZ PrepCom Meeting. These meetings advanced the finalisation of the agreement to set up a regional coordinating centre for animal diseases and zoonoses. Frameworks to improve and harmonise the overall standards of animal health, welfare, production, as well as the regulation of veterinary products for the region, were also discussed and updated.

35th Special Senior Officials Meeting (SOM) of the ASEAN Ministers on Agriculture and Forestry (AMAF) and 13th Special SOM AMAF Plus Three (AMAF+3)

Ms Tan Poh Hong, CEO of AVA, led the Singapore delegation to the 35th Special SOM AMAF and 13th Special SOM AMAF+3 held on 18-20 August 2014 in Kota Kinabalu, Malaysia. Senior officials discussed the progress of various initiatives, such as the ASEAN Integrated Food Security Framework and Strategic



Minister of State for National Development and Defence Dr Mohamad Maliki Bin Osman (back row, 2nd from right) at the 3rd APEC Food Security Ministerial Meeting.

Plan of Action on Food Security, ASEAN Plus Three Emergency Rice Reserve, and ASEAN Food Security Information System.

3rd APEC Food Security Ministerial Meeting

Dr Mohamad Maliki Bin Osman (Minister of State for National Development and Defence) led a Singapore delegation to the 3rd APEC Food Security Ministerial Meeting held on 19 September 2014 in Beijing, China.

The ministers endorsed the Beijing Declaration on APEC Food Security, which called on APEC economies to boost agricultural productivity and food production, increase food availability based on sustainable development, improve post-harvest management to reduce food loss, and strengthen regional cooperation to promote food security.

36th Meeting of AMAF & 14th Meeting of AMAF+3

The 36th AMAF and the 14th AMAF+3 meetings were held from 23 to 24 September 2014 in Myanmar. Dr Mohamad Maliki Bin Osman led a five-member Singapore delegation to the meetings.

Chaired by His Excellency U Myint Hlaing (Union Minister for Ministry of Agriculture and Irrigation, Myanmar) and assisted by the ASEAN Secretariat, AMAF prioritised key measures and activities to realise the objective of an ASEAN Economic Community by 2015. Ministers and senior officials also deliberated on issues and discussed the development of the vision, objectives and goals of ASEAN Cooperation in Food, Agriculture and Forestry towards 2025. A number of documents developed by the sectoral working groups on food, agriculture (crops, livestock, and fisheries), and forestry were endorsed at the meetings.

4th ASEAN-China Ministerial Meeting on Quality Supervision, Inspection and Quarantine

Dr Mohamad Maliki Bin Osman also led a Singapore delegation to the 4th ASEAN-China Ministerial Meeting on Quality Supervision, Inspection, and Quarantine on 25 September 2014 in Myanmar.

A significant development included the signing of the ASEAN-China Memorandum of Understanding (MOU) on Strengthening Sanitary and Phytosanitary Cooperation. The MOU would further strengthen the strategic partnership to safeguard the life and health of humans, animals, and plants, as well as facilitate and promote regional trade.

41st Session of the Committee on World Food Security (CFS)

Chief Executive Officer of AVA Ms Tan Poh Hong led a Singapore delegation to the 41st Session of CFS in Italy from 13 to 18 October 2014. The CFS discussed key global policy and regulatory issues, focusing on food security and nutrition. It also reviewed reports and proposals made by the Steering Committee of the High Level Panel of Experts on Food Security and Nutrition and Open-Ended Working Groups.

ASEAN and International Discussions on Wildlife Matters

In FY 2014, AVA represented Singapore on ASEAN and international platforms where wildlife matters were discussed. Singapore continues to support the efforts to combat wildlife crime and to tap on existing frameworks such as the ASEAN-Wildlife Enforcement Network (ASEAN-WEN) for information sharing and intelligence exchange.

TECHNICAL COOPERATION WITH MYANMAR

In January 2012, Singapore and Myanmar signed a Memorandum of Understanding (MOU) on the Singapore-Myanmar Technical Cooperation Programme (SMTCP), which was established to further strengthen bilateral relations and increase people-to-people exchanges. Under the SMTCP, Singapore will provide targeted technical assistance to support Myanmar's development in three broad areas, namely, economic development, human resource development, and public administration. Training in trade facilitation is among the many forms of support to be provided.

As part of the SMTCP and with support from the Ministry of Foreign Affairs, five officials from the Ministry of Livestock and Fisheries attended a training course on hatchery technology for Asian Seabass held at AVA's Marine Aquaculture Centre from 1 to 12 September 2014. The course, conducted by AVA officers, consisted of lectures and practical sessions on broodstock and egg management, live feeds culture, larval rearing and weaning, as well as fish health and disease management.



Participants from Myanmar with AVA trainers at AVA's Marine Aquaculture Centre.

Field trips to ornamental fish farms and offshore farms were arranged for the participants to gain a better understanding of Singapore's aquaculture industry.

MARINE FISHERIES RESEARCH DEPARTMENT (MFRD) PROGRAMME / SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTRE (SEAFDEC)

AVA, as a collaborating centre of SEAFDEC, promotes the post-harvest technology development of fisheries in Southeast Asia, by implementing activities under the SEAFDEC's MFRD programme. These activities include the transfer of post-harvest technology and best practices to the fish processing industry in the region.

46th Meeting of the SEAFDEC Council

AVA hosted the 46th Meeting of the SEAFDEC Council from 1 to 4 April 2014. During the meeting, the Council noted the progress and achievements of SEAFDEC, and approved the proposed programme of activities to be undertaken by SEAFDEC in 2014. These activities were formulated after taking into consideration the 'ASEAN-SEAFDEC Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020'.

Traceability Systems for Aquaculture Products

Under the Japanese Trust Fund V, project preparation for the 'Technical Compilation' and 'Drafting of the Regional Guidelines on Traceability System for Aquaculture Products in Southeast Asia' commenced in the first quarter of FY 2014.

Both the Technical Compilation and Regional Guidelines will serve as a useful resource for Member Countries in their implementation of traceability systems for aquaculture products.

Marine Biotoxins Analysis and Monitoring in ASEAN

Under the Japanese Trust Fund VI of the MFRD programme, AVA's Post-harvest Technology Centre successfully organised a Regional Training Course in Biotoxins Analysis on 2-6 June 2014 in Singapore. This training course was jointly conducted with the Veterinary Public Health Laboratory and two biotoxins experts from Japan and Vietnam.

The course, attended by 21 participants from the 10 member countries, covered instrumental methods for the detection, characterisation, and quantification of Amnesic Shellfish Poisoning toxin, Azaspiracids toxin, and Brevetoxin. With the knowledge and skills gained, participants will be able to set up these methods in their own laboratories to conduct the biotoxins analyses.

DISTINGUISHED GUESTS

Over the FY, AVA received several foreign dignitaries and overseas officials for exchanges and collaborative work. Many came to learn about our regulatory control and functions, as well as to tour our facilities and centres.

April 2014

3 April: The Ambassador of Japan to Singapore, His Excellency Haruhisa Takeuchi, made an introductory visit to AVA to build on good bilateral working relationship.



Minister for National Development Mr Khaw Boon Wan receives FAO DG Dr Graziano da Silva during the latter's inaugural official visit to Singapore.

8 April: The Ambassador of Tunisia to Singapore, His Excellency Mourad Belhassen, visited AVA to learn about our roles and functions, as well as explore areas of cooperation.

10 April: The Ambassador of Costa Rica to Singapore, His Excellency Jairo Hernandez Milian, visited AVA to understand more about Singapore's food safety system and promote agricultural trade.

May 2014

12 May: AVA hosted His Excellency Marek Sawicki, Minister of Agriculture and Rural Development of Poland, to a meeting on animal health and agricultural trade.

September 2014

5 September: The Director-General of the Food and Agriculture Organisation, Dr José Graziano da Silva, made an inaugural official visit to Singapore. He visited AVA to exchange views on international and regional efforts relating to food security and agricultural development. He also made a courtesy call on Minister for National Development Mr Khaw Boon Wan.

October 2014

24 October: His Excellency Zenon Kosiniak-Kamysz, Ambassador of Poland to Singapore, visited AVA and discussed bilateral agricultural trade relations, as well as the possibility of increasing trade in agricultural products.

January 2015

14 January: The Vice Minister of Agriculture and Forestry of Lao PDR, Dr Khamphad Soulinphoumy, visited AVA to learn about Singapore's experience in agriculture research and technology development.

20 January and 25 February: AVA hosted two visits by Japan's Ministry of Economy, Trade and Industry and the Japan Wildlife Research Centre. Topics discussed included the CITES Universal Tagging System for identification of crocodylian skins, as well as the marking, tracking, and trade regulation of the Asian Arowana (*Scleropages formosus*) or Dragon Fish in Singapore.

February 2015

23 February: AVA hosted His Excellency Haruhisa Takeuchi, Ambassador of Japan to Singapore, and discussed ongoing engagements in the areas of food safety and agri-food trade.

March 2015

2 March: AVA hosted His Excellency Zenon Kosiniak-Kamysz, Ambassador of Poland to Singapore, for a discussion on bilateral agricultural trade relations.



ORGANISATIONAL EXCELLENCE



In all that we do, we place the public at the heart of our work. As one AVA, we constantly aim to scale greater heights and overcome challenges to fulfil our Vision and Mission.





ORGANISATIONAL EXCELLENCE

Excellence in Our People and Organisation

At AVA, we aspire to be a people-centric organisation where staff may find personal fulfilment in what they do. We believe that this in turn will motivate them to contribute whole-heartedly to AVA and our society at large. Complementing this belief, we empower our people with technology so that they are equipped to find innovative ways of improving and streamlining their work processes. These set us on the path towards being a progressive and professional organisation. /

DEVELOPING AND RECOGNISING OUR STAFF

AVA firmly believes in developing all staff to reach their fullest potential so that they are not only equipped to fulfil their job duties, but also contribute to the society.

NURTURING AND VALUING OUR STAFF

During the FY, we continued to engage the hearts and minds of our staff through various learning and development programmes including local and overseas technical training, as well as knowledge sharing sessions. In addition, we continued to roll out training programmes in core generic competencies, which covered topics on our operating environment; innovation; analytical thinking; teamwork and collaboration; customer centricity; and public

service ethos. On the whole, we achieved an average of 10.21 learning days per staff.

On 13-14 November 2014, AVA in collaboration with the Japan Food Research Laboratories organised a workshop on 'Analyses of Ciguatera Food Poisoning Toxins'. A total of 80 AVA staff, along with invited participants from other government agencies, tertiary institutions, and a private company, benefitted from insights shared by two Japanese experts who were invited to speak at the workshop.

A total of 33 AVA officers attended a training seminar on the Performance of Veterinary Services (PVS) Tool conducted by the World Organisation for Animal Health (OIE). Held 25-27 November 2014 at AVA's Veterinary Public Health Centre, the seminar was conducted by a group of experts from OIE



Experts from OIE, PVS evaluators, and AVA officers at the training seminar on PVS Tool.



National Day Award recipients and members of the leadership team from AVA, with Minister for National Development Mr Khaw Boon Wan (6th from left) and AVA Chairman Mr Koh Soo Keong (4th from left).

headquarters and PVS evaluators. The OIE PVS Tool is a global programme for the compliance of a country's veterinary services with OIE standards.

In FY 2014, AVA's Plant Health Laboratories (PHL) developed and conducted a course on Basic Plant Bio-security to equip AVA officers with the skills and knowledge in basic plant bio-security. The course comprised nine modules and involved 17 AVA officers.

TALENT ATTRACTION AND DEVELOPMENT

AVA continued to build up our pool of talent through scholarship programmes. In FY 2014, three undergraduate scholarships were awarded in the disciplines of Veterinary Science, Food Science, and Economics. A total of two postgraduate scholarships were awarded, including one scholarship for an in-service officer to pursue a Master of Science in One Health (Infectious Diseases) and another scholarship to allow an undergraduate scholar to pursue a Masters in Economics. We also sponsored undergraduate scholars pursuing their studies for selected exchange programmes and in summer schools to broaden and enrich their overall learning experiences.

AVA also continued to strive for excellence in our professional capabilities. In order to enhance the technical and professional competencies of our staff, officers were sent for professional development courses, seminars, and overseas study trips.

A member of our leadership team was attached to OIE as part of his sabbatical to gain exposure and keep abreast of the latest global and regional developments in matters relating to animal health and zoonosis.

PERFORMANCE MANAGEMENT

AVA's performance management framework is structured to clearly bring out and tie in with our shared ethos, values, and desired behaviours. Officers are encouraged to demonstrate the desired behaviours and strive for excellence in Public Service.

PEOPLE MANAGEMENT

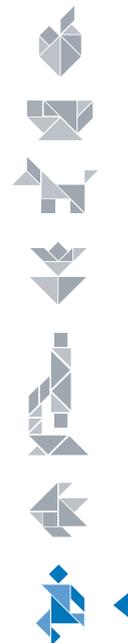
In the FY, we continued to review the total rewards package for our staff. Several enhancements were made, including salary revisions to various schemes of service. In addition, we amalgamated six Division IV schemes into one scheme to allow better career progression for this group of staff. We have also reviewed our re-employment policy to re-employ officers up to the age of 67.

AWARDS AND RECOGNITION

A total of 68 officers were promoted in FY 2014 in recognition of their excellent performance and potential to take on greater responsibilities.

The National Day Awards, which honours staff for their invaluable contributions and commitment to the public sector, were bestowed on eight AVA officers this FY. These comprised one Silver Public Administration Medal, two Bronze Public Administration Medals, two Commendation Medals, two Efficiency Medals, and one Long Service Medal.

In addition, 124 officers reached various service milestones and were awarded the AVA Long Service Awards in recognition of their contribution and dedication to the organisation.





An AVA officer in the audience posing a question to our Leadership Team during Staff Conference in March 2015.

STAFF WELL-BEING

During the FY, enhancement was made to the Medisave-cum-Subsidised Outpatient (MSO) medical scheme. Officers now receive an additional one percent of Medisave contribution to help defray medical costs.

LABOUR-MANAGEMENT RELATIONS

In recognition of our sustained efforts in strengthening understanding and cooperation between the AVA Management and the Amalgamated Union of Statutory Board Employees (AUSBE), AVA was presented the Ong Teng Cheong Labour Leadership Institute's Workplace Partnership Award in 2014 for the fourth time.

AVA continued to strengthen our harmonious labour-management relationship with the AUSBE by supporting the union's efforts in membership drives and in improving staff welfare.

During staff orientation and refresher orientation sessions, union officials were also invited to share union benefits with AVA officers.

In support of the union's staff welfare programmes, AVA continued to provide an annual grant of \$6,000

to AUSBE. AVA and AUSBE also jointly administered the AVA Bursary Award for the third year running in FY 2014. This award provides financial support for the education of children of eligible AVA staff. Five children of AVA union members received the award in the FY.

Joint training programmes were organised to allow staff and union officials to learn together and improve mutual understanding. A total of 74 officers attended training programmes such as the Basic Course in Industrial Relations; Speaking with Confidence, Impact and Purpose; and Effective Teambuilding through Shared Goals and Leadership.

AVA's leadership team regularly engages AUSBE on staff matters whenever there are revisions made to our policies. The aim is to jointly anticipate and address concerns on the policies prior to implementation. For example, the union was deeply involved in the amalgamation of the Division IV schemes by helping to explain the amalgamation to the officers.

STAFF ENGAGEMENT AND FEEDBACK

To develop a collaborative and interactive culture anchored on strong teamwork, various engagement programmes and initiatives continue to be implemented in FY 2014. AVA's leadership team regularly engages staff during tea and dialogue sessions. Officers are kept updated on organisational events and officers' achievements via internal circulars and e-newsletter such as NewsREAL and Life@AVA.

In October 2014, a new intranet was launched to provide an enhanced platform for staff to collaborate and share information. The virtual collaborative space allows file-sharing and discussions among team members. In addition, Organisation Excellence and Human Resource microsites within the new intranet further facilitate the dissemination of related information to staff. Booking systems for meeting rooms, IT resources, and corporate membership cards were also streamlined and improved.



AVA CEO Ms Tan Poh Hong presenting an annual grant of \$6,000 to AUSBE in support of the union's staff welfare programmes.



A bright and airy pantry area in AVA's headquarters at the JEM Office Tower.

Relocation to JEM

On 15 December 2014, AVA's headquarters relocated from the Ministry of National Development (MND) Complex at Maxwell Road to the JEM Office Tower, a Green Mark building in Jurong East.

Officers were involved in the relocation through various engagement platforms. Feedback on the design of office furnishings was sought, and staff members were given tours around the office before moving in. A microsite was also launched to allow staff to have easy access to essential information that would help them adapt to the new environment. In addition, post-relocation engagement sessions were held to address concerns.

ORGANISATIONAL AND SERVICE EXCELLENCE

AVA strives to be an excellent organisation where staff feels a sense of belonging and exhibits AVA's shared values of Excellence, Care, Integrity, and Teamwork.

We aim to create an environment where officers are able to learn, grow, and innovate to deliver excellent business results. We constantly look into improving our processes and systems to better serve our stakeholders and customers.

INNOVATION AND TEAMWORK

AVA values innovation and teamwork amongst staff. We aim to create a trusting and nurturing environment where our staff can collaborate to innovate and try new things to deliver results.

Innovation Challenge

In 2014, AVA launched its second Innovation Challenge to further promote a culture of innovation and creativity in AVA. Staff can make use of the AVA Innovation Fund to develop their prototypes and test their innovative ideas.

During the FY, a total of \$18,700 was awarded to projects, including the development of two prototypes that use solar energy to power an indoor guppy breeding system and to trap diamondback moths.

Staff Ideas and Projects

In AVA, we value and encourage innovative ideas and solutions through the AVA STAR (Striving and Aiming for Excellence through Teamwork) and TWINKLE (Tapping Wild and Innovative Ideas for Knowledge, Learning and Exchange) Schemes. A total of 1,852 ideas were contributed by staff and 41 STAR projects were completed. On average, each staff contributed 2.6 TWINKLE ideas in FY 2014.

At the National Innovation & Quality Circles Convention held in FY 2014, six teams won the Gold Award, three won the Silver Award, and one won the Bronze Award.



Proud winners of the National Innovation & Quality Circles Convention awards with members from AVA's leadership team.



The two-week Organisational Excellence Festival featured engaging activities in line with the theme of 'AVA, Transform'.

ORGANISATIONAL EXCELLENCE

To celebrate and promote staff's contribution to excellence in AVA, the annual Organisational Excellence Festival (OEF) 2014 was successfully held from 29 August to 10 September 2014. In line with the theme of 'AVA, Transform', OEF was organised around three key elements of recognition and celebration, reinforcement of the culture of excellence in AVA, and staff engagement. About 500 staff participated in the two-week festival.



Participants at an engaging workshop on 'Customer Service Ideas for AVA'.

INITIATIVES TO ENHANCE CUSTOMER SERVICE

During the FY, various initiatives to enhance our service delivery and inculcate a customer-oriented culture in AVA were implemented.

AVA Service Day

AVA's leadership team showed their commitment to service excellence by personally serving customers at the frontline for a day. The video of our leadership team providing customer service was shown on AVA's Service Day on 3 September 2014. On that day, 66 well-deserving officers also received Excellent Service Awards (comprising 57 Gold and nine Silver awards) for their exemplary service. In addition, a workshop on 'Customer Service Ideas for AVA' was conducted to reinforce the message that everyone in AVA has a role to play in providing excellent service.

AVA Service Centre

AVA's new Service Centre commenced operations at JEM Office Tower on 15 December 2014, sharing premises with the Building & Construction Authority. This Service Centre consolidates services that were previously provided at AVA's headquarters at Maxwell Road as well as at the Centre for Animal Welfare and Control in Pasir Panjang.



AVA's new Service Centre at the JEM Office Tower.

The new Service Centre was designed to enhance customer experience. Customers can obtain a queue number by scanning their identity cards at the queue kiosk. An SMS will be sent to alert customers when their queue numbers are called. Should they prefer to wait in line, educational videos screened on LED panels and publications at the 'Green Wall' would help to ease the wait. In addition, self-help options are available at the e-bar.

Other ongoing efforts to improve our service delivery include the development of a Customer Service Portal for customers to access to all AVA services seamlessly. Customers' data, as well as their transactions and interactions with AVA, will be integrated into a holistic Customer Relationship Management System, which is currently being developed to enable effective tracking of responses.

PUBLIC SECTOR TRANSFORMATION

During the FY, AVA embarked on a journey of Public Sector Transformation (PST), which is an initiative led by the Public Service Division (PSD) to create one trusted public service with citizens at the centre. AVA's PST action plan focused on six key areas:

- Greater staff engagement
- Tightening of measures to prevent fraudulent behaviour and misconduct
- Strengthened service capabilities
- Improved government communications
- Joint-solutioning for better outcomes
- Greater public engagement.

AVA will continue to push on with PST efforts to ensure that AVA remains a relevant and excellent organisation.

Improving Written Communications

Since May 2014, AVA, together with 35 agencies, has been participating in an initiative by PSD to improve written communications, as well as to empower officers to write in a clear, concise, and easy-to-read manner.

Working with the British Council, AVA revised 10 pieces of correspondences that officers commonly write in the course of their work. A Writing Guide will also be developed to serve as a reference on improved written correspondence for all staff. To ensure that the new writing style was adopted and embraced by the whole organisation, training workshops for officers were conducted during the FY.

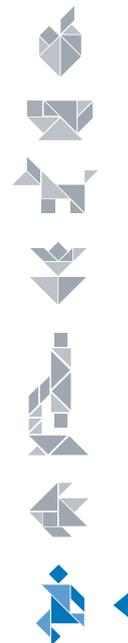
A series of sustained activities were planned for the next FY to reinforce the importance of writing simply and clearly.

OneService@SG Initiative

AVA participated in OneService@SG, an inter-agency initiative led by the Municipal Service Office (MSO) to improve the delivery of municipal services in Singapore.

Municipal services pertain to the upkeep and improvement of the communal living environment of Singaporeans. These include managing the cleanliness of public areas, nuisances caused by animals, and maintaining and repairing transport infrastructure. The OneService@SG system includes features to re-route misdirected public requests and escalate grey-area issues.

In addition, a mobile application was also launched by MSO on 25 January 2015 for the public to report municipal issues.



Service Management Framework

During the FY, AVA also worked on the Service Management Framework project led by PSD. This Framework will serve as a common guiding tool for the Public Service to achieve a consistently high level of service across Singapore. As a participating agency, AVA will develop blueprint strategies and implementation roadmaps for sustained service excellence.

LEVERAGING INFO-COMMUNICATIONS TECHNOLOGY

Info-communications technology (ICT) plays a key role in supporting our organisation's mission and goals. By harnessing state-of-the-art technology and streamlining processes, we are able to develop useful information systems for the benefit of our customers and staff.

Improving Public eServices

In November 2014, AVA launched a new eLicensing system, which allows customers to apply for multiple AVA licences, import and export permits, and certificates online. Replacing the eCLIPS system, the new system has enhanced features such as:

- Automatic electronic notifications
- Option to attach documents when submitting applications
- Function for optical-watermarked export certificates to be printed by applicants upon payment and approval
- Edit function for amendment, renewal, and cancellation of licenses



The enhanced AVA website allows easy access to commonly queried topics relevant to visitors' needs.

An enhanced AVA website was launched on 20 January 2015 as part of ongoing efforts to provide better customer service. The website's structure allows easy access to commonly queried topics relevant to visitors' needs. In addition, it is optimised to be reader-friendly on mobile devices.

Contents on the website have also been improved to be more concise and easy to understand. AVA will continue with the development of new content to better meet customers' needs.

In March 2015, AVA launched an e-service for local poultry farms to submit their monthly production data, which was previously done via email or fax. The online service also allows farmers to update their dossiers for Singapore Quality Egg Scheme membership renewal.

IMPROVING OPERATIONAL EFFICIENCY

AVA successfully migrated ICT services from our former premises at Maxwell Road to the new office at JEM Office Tower. At the same time, new ICT features were introduced, such as the Voice-over Internal Protocol phone system, which can be integrated with our future Customer Relationships Management System. In addition, a video-conferencing facility was set up to enable instant face-to-face communication with internal or external parties.

During the FY, AVA continued to tap on mobile technology to support the workflow for inspection of food imports and grading of food factories. Besides allowing inspectors to enter and submit inspection reports immediately on-site, the system was further enhanced. Previously, we required customers to sign on hardcopy forms to acknowledge that samples were collected for laboratory testing. With the enhanced system, our mobile devices are now able to capture digital signatures, thus resulting in less paperwork to process in the backend.

TIGHTENING ICT SECURITY

During the FY, AVA continued to introduce measures to safeguard our ICT systems against cyber threats. Programme source codes in ICT systems were scanned to detect potential security flaws. Penetration tests were also conducted to simulate a software attack on our ICT systems, with the aim to bridge any security gaps and prevent unauthorised access to AVA's system and data. These measures allow for early detection and prompt removal of security vulnerabilities.

In addition, a Disaster Recovery Plan (DRP) exercise was conducted to familiarise users of critical ICT application systems with the DRP process. The exercise tested AVA's preparedness and ability to provide its services in the event that the ICT systems break down.

PROMOTING HEALTHY LIFESTYLE AND BUILDING ESPRIT DE CORPS

At AVA, we value our staff and continuously strive to cultivate a cohesive work environment that inspires and motivates them. Besides helping our staff to build esprit de corps, we also encourage them to lead a healthy lifestyle. The AVA Staff Recreation Committee



AVA's leadership team dressed to suit the theme of 'Rewind: Blast from the Past'.

(ASRC) organised a wide range of recreational, health, and family-oriented activities throughout the FY. Besides providing an opportunity for networking, these activities also promote a sense of camaraderie and belonging to AVA.

SPORTS

We aim to build rapport and cohesiveness within AVA through sportsmanship and recreational activities that bring various groups together. A wide variety of sports activities, from games for leisure to competitive tournaments, are regularly organised to promote staff interaction.

Sports Training and Participation

Inter-Group sports events were organised by ASRC during the FY. On 27 September 2014, a bowling competition saw active participation from officers. In addition, badminton and dragon boat training sessions were held every Wednesday and Saturday, respectively. At the Club HDB-Ministry of National Development Recreation Committee (MNDRC) Dragon Boat Race held on 13 September 2014, AVA was 2nd Runner-up in the MND Inter-Agency Mix and Senior Management Open categories.

During the FY, our officers also took part in events such as MNDRC Cross-Country Championship 2015, Public Service Sports and Family Day, Public Service 9-Pin Tap Bowling Competition, REDAS Bowling Competition, Standard Chartered Marathon 2014, as well as Civil Service Club's Walks at Sungei Punggol, Bishan-Ang Mo Kio Park, Labrador Nature Reserve, and Botanic Gardens.

SOCIAL

The AVA Family Day 2014, held at Universal Studios Singapore on 30 August 2014, was attended by more than 500 AVA staff and their family members.

AVA's Annual Dinner & Dance FY 2014 was held at Marina Bay Sands on 23 January 2015, with AVA staff dressed up to suit the theme of 'Rewind: Blast from the Past'. A total of 452 staff, guests, AVA board members, and AVA union representatives attended the event.

A total of 24 officers, who retired in 2014, were also invited to the Dinner & Dance, where they were presented with a retirement memento.

During the FY, an exclusive movie screening was organised for 85 AVA staff on 2 July 2014.

HEALTHY LIFESTYLE

AVA understands that a healthy workforce is a productive one. In FY 2014, we rolled out a series of programmes to generate greater awareness of health and wellness. These programmes focused on aspects such as healthy eating, cancer awareness, ergonomics, and mental well-being. We also worked with the union to organise a talk on hypertension where a nutritionist provided tips on healthier food choices. Officers were also encouraged to keep themselves updated on their health status by participating in the Annual Corporate Health Screening programme.

In addition, gyms and exercise corners in various AVA centres provided staff with the facilities to exercise at their convenience. The engagement of a personal trainer for the gym at AVA's Veterinary Public Health Centre has led to an increase in the number of staff using the gym facilities.

In conjunction with the Organisational Excellence Festival 2014, an "Active Day" was also set aside to promote a healthy and active lifestyle through fun exercises such as Line Dancing and 'Bokwa' (a type of cardio workout), as well as simple games.

To encourage healthy eating habits, a different fruit was given to each AVA staff on a bi-monthly basis, as part of Fruit Day.





Flowers sold at the Charity Bazaar.

CARING FOR OUR COMMUNITY AND ENVIRONMENT

CHARITY

AVA strongly believes in giving back to the community. As part of our social outreach programme, a Charity Bazaar was held on 3 October 2014 to raise funds for AVA's adopted charity. A variety of food and non-food items were sold and staff came together to raise over \$18,500 for the Kampung Senang Charity and Education Foundation.

In support of the President's Challenge 2014, AVA raised a total of \$5,800 for 50 needy charities. Together with the MND family of statutory boards, we successfully adopted three Heart Buses for three consecutive years.

CORPORATE SOCIAL RESPONSIBILITY

As part of our corporate social responsibility efforts, AVA volunteers helped to clean the enclosures and feed the animals at the Society for the Prevention of Cruelty to Singapore on 16 April 2014.

AVA also collaborated with the Northeast CDC to organise an educational visit to Kok Fah Farm on 26 July 2014 for a group of underprivileged children.

ENVIRONMENT AND CONSERVATION

Playing a part to conserve the environment, different bins were placed around AVA's headquarters for the segregated collection of general waste, cans, and papers.

In addition, AVA supported Earth Hour on 28 March 2015, by switching off the main lightings at our headquarters and centres. The gesture demonstrated AVA's commitment to do more for our planet in combating global warming.



AVA volunteers at the Society for the Prevention of Cruelty to Singapore.



Staff Strength for FY 2014

Categories of Staff	Corporate & Technology	Regulatory Programmes & Operations	Total
Management/Professional	144	249	393
Technical Support	64	189	253
Non-technical Support	62	41	103
Operations Support	45	54	99
Total	315	533	848

Distribution of Staff by Qualification for FY 2014

Qualifications Classification	Total
Degree and above	405
Diploma	110
A-levels and below	333
Total	848

Distribution of Staff by Age Group for FY 2014

Age Classification	Total
51 and above	298
41-50	145
31-40	211
30 and below	194
Total	848

Performance in STAR (STriving and Aiming for Excellence through Teamwork) for FY 2014

No. of STARs	No. of Completed Projects
53	41

Performance in TWINKLE (Tapping Wild and INnovative Ideas for Knowledge, Learning and Exchange) for FY 2014

Participation Rate	Suggestion Ratio
95.8%	2.6



MAJOR SOURCES



UNITED STATES

- » Beef
- » Chicken
- » Fruits
- » Milk
- » Pork
- » Rice
- » Vegetables



SOUTH AFRICA

- » Fruits



INDIA

- » Fish
- » Milk
- » Rice
- » Sugar
- » Vegetables



THAILAND

- » Fish
- » Fruits
- » Milk
- » Rice
- » Sugar
- » Vegetables



BRAZIL

- » Beef
- » Chicken
- » Pork



VIETNAM

- » Fish
- » Fruits
- » Rice
- » Vegetables
- » Sugar





OF SUPPLY



MALAYSIA

- » Chicken
- » Cooking Oil
- » Duck
- » Eggs
- » Fish
- » Fruits
- » Milk
- » Sugar
- » Vegetables



INDONESIA

- » Cooking Oil
- » Fish
- » Milk
- » Pork
- » Vegetables



PHILIPPINES

- » Fruits



AUSTRALIA

- » Beef
- » Cooking Oil
- » Fruits
- » Milk
- » Mutton
- » Pork
- » Sugar
- » Vegetables



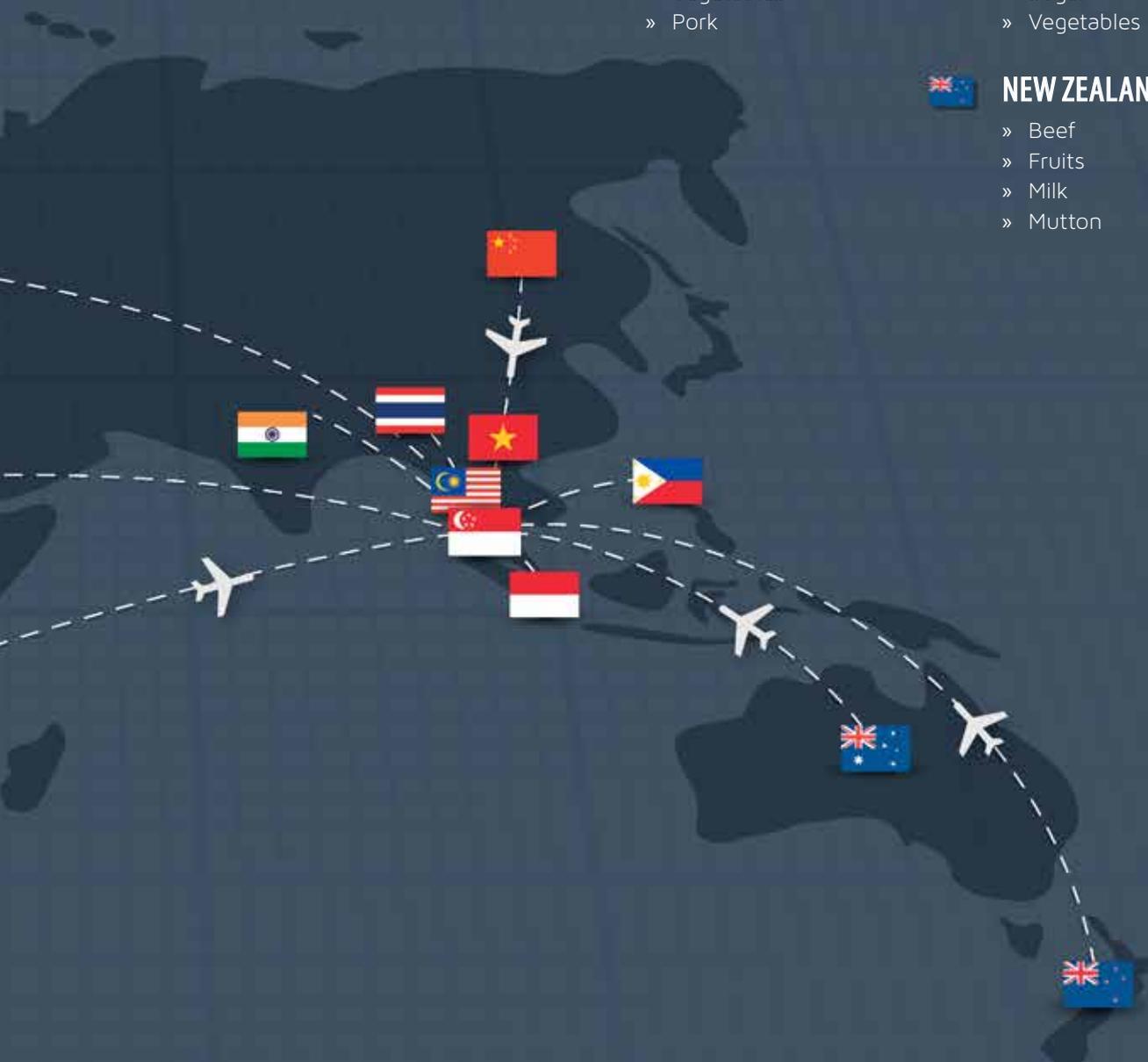
CHINA

- » Fish
- » Fruits
- » Vegetables
- » Pork



NEW ZEALAND

- » Beef
- » Fruits
- » Milk
- » Mutton





PERFORMANCE INDICATORS

VETERINARY PUBLIC HEALTH & FOOD SAFETY

OUTCOME INDICATORS/OBJECTIVES

Objective	Outcome Indicators	Performance
Ensure a resilient supply of safe and wholesome food to Singapore	Number of cases of food-borne illnesses per 100,000 population	There were no reported cases of food borne illnesses that were directly attributable to AVA.
	Number of key food items that has less than 50% of supply from a single country	Achieved for key food items for pork, chicken, and fish, except for hen eggs and leafy vegetables (for which imports from Malaysia were about 75% and 58%, respectively).

OUTPUT INDICATORS

Activity	Volume
To hold business cluster meetings/trade association meetings	12 business clusters were held
To conduct food sourcing missions/ study trips	3 food sourcing mission/study trips were conducted
To monitor the compliance status of locally manufactured/ processed food with Food Regulations	90.7% of the total number of inspections conducted in FY 2014 was in compliance with the Sale of Food Act and the Wholesome Meat and Fish Act.
	88.6% of the total number of samples collected in FY 2014 was in compliance with the Sale of Food Act and the Wholesome Meat and Fish Act.
To conduct inspection and sampling of export consignments within three working days	100% of the export consignments were carried out on the scheduled dates of the manufacturers/exporters.
To process application for food establishments' licenses within five working days from the date of receipt of application	100% of applications for food establishments' licenses were processed within five working days from the date of receipt of application.



ANIMAL & PLANT HEALTH

OUTCOME INDICATORS/OBJECTIVES

Objective	Outcome Indicators	Performance
Safeguard animal and plant health	Percentage of freedom from important animal and plant disease outbreaks	97.4% freedom or free from outbreaks of at least 113 out of 116 important animal and plant diseases

OUTPUT INDICATORS

Activity	Volume
To provide laboratory diagnostic and analytic services to identify and manage animal diseases and plant pests, as well as soil health related problems	171,394 tests

FOOD SUPPLY AND TECHNOLOGY

OUTCOME INDICATORS/OBJECTIVES

Objective	Outcome Indicators	Performance
Management of the local agri-industry (farming sector)	Level of productivity of vegetable, fish, and layer farms in Agrotechnology Parks and coastal fish culture farms	<ul style="list-style-type: none"> • Hen and quail eggs: 16.2 million pieces/hectare • Leafy vegetables: 115.5 tonnes/hectare • Coastal fish farms: 35.7 tonnes/hectare • Land-based fish farms: 12.4 tonnes/ hectare
	Percentage of key food items produced locally	<ul style="list-style-type: none"> • Fish: 8% • Leafy vegetables: 12% • Eggs: 25%

OUTPUT INDICATORS

Activity	Volume
Accreditation of overseas food sources	41 inspection trips
To test food samples	51,932
To conduct laboratory tests	1,799,077
To manage farms in agrotechnology parks and fish farming zones	235 land farms and 117 coastal fish farms

AGRI-TRADE FACILITATION SERVICES

OUTCOME INDICATORS/OBJECTIVES

Objective	Outcome Indicators	Performance
Facilitate trade of animal, plant and food product	Ensure no more than 0.3% of certified export consignments are rejected from importing countries.	Fulfilled, with 0% of certified export consignments rejected from importing countries.

OUTPUT INDICATORS

Activity	Volume
To issue export and import documents for animal, plant, and food products	67,706 export documents were issued 911,678 import documents were issued

INTERNATIONAL AND REGIONAL COMMITMENTS

OUTCOME INDICATORS/OBJECTIVES

Objective	Outcome Indicators	Performance
Represent the government internationally on matters related to or connected with the agri-food and veterinary sectors	Fulfil Singapore's international obligations in SEAFDEC, ASEAN, APEC, and CITES	Fulfilled
	Singapore's interests in agri-food and veterinary services are not compromised	Achieved

OUTPUT INDICATORS

Activity	Volume
To manage the Marine Fisheries Research Department (MFRD/SEAFDEC) programmes through the provision of infrastructure (land, buildings and supporting facilities) and local staff	Implemented successfully and in a timely manner all regional projects and activities under the MFRD/SEAFDEC programmes, i.e. 2 regional projects and the SEAFDEC information programme. The 46th Meeting of the SEAFDEC Council was also successfully hosted in Singapore in April 2014.
To participate in relevant meetings and activities of AMAF, OIE, SEAFDEC, CITES, CODEX Alimentarius, Bilateral, WTO FTA , APEC, FAO and IPPC	Participated in 147 relevant meetings and activities



STATISTICS

CONSUMPTION, IMPORT & LOCAL FARM PRODUCTION (JAN TO DEC 2014)

Tonnes	Beef [†]	Chicken [†]	Cooking Oil	Duck [†]	Fish [†]	Fruits [^]	Hen Eggs (Mil Pcs)	Mutton [†]	Pork [†]	Rice	Sugar	Vegetables [^]
Consumption	11,140	170,926	430,970	13,844	90,998	392,202	1,712	13,440	85,491	325,680	298,392	522,522
Import	26,839	178,133	583,253	13,917	98,593	431,796	1,283	13,766	109,538	498,502	372,634	524,390
Local Farm Production	-	- [^]	-	-	5,639 [*]	-	433	-	-	-	-	22,720

* Figure includes coastal fish farm production, land-based fish farm production, and fish landings.

† Figures are aggregated based on live, chilled, and frozen forms.

^ Figures are aggregated based on fresh and chilled forms.

^ There is no broiler farm in Singapore.

PER CAPITA CONSUMPTION (FROM JAN TO DEC EACH YEAR)

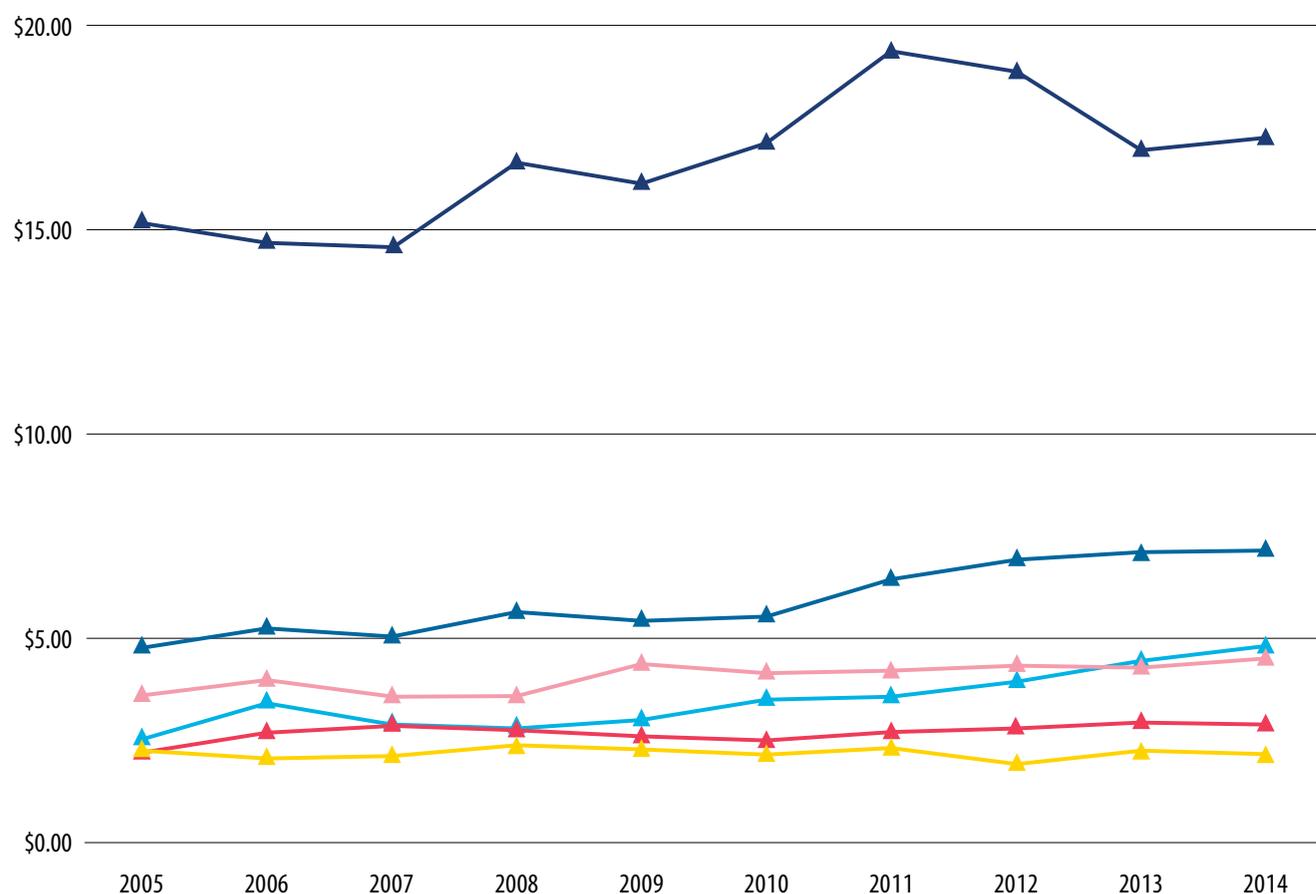
Item	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Meat - Poultry	33	30	34	35	34	35	36	36	35	34
Chicken (kg) [†]	30	27	31	32	31	32	33	33	32	31
Duck (kg) [†]	3	3	3	3	3	3	3	3	3	3
Meat - Livestock	25	25	27	26	25	26	25	25	21	20
Pork (kg) [†]	19	20	21	20	19	20	19	20	17	16
Beef (kg) [†]	4	3	4	4	4	4	4	3	2	2
Mutton (kg) [†]	2	2	2	2	2	2	2	2	2	2
Seafood (kg)[†]	27	26	25	24	24	22	23	22	22	23
Fish (kg)	18	17	16	16	16	15	16	15	16	17
Other seafood (kg)	9	9	8	8	7	7	7	7	7	6
Vegetables (kg)[^]	93	93	93	91	91	93	93	94	93	96
Leafy vegetables (kg)	18	18	17	16	17	16	15	16	16	16
Other vegetables (kg)	74	76	76	75	74	77	78	78	77	79
Others										
Fruits (kg) [^]	85	80	74	71	71	68	67	67	70	72
Hen shell eggs (pcs)	286	291	302	302	300	311	307	308	312	313

Note: All calculations are based on total population. Total population comprises Singapore residents (citizens & PRs) and foreigners staying in Singapore for at least one year. For breakdown of seafood and vegetable, figures may not add up to the total due to rounding.

† Figures are aggregated based on live, chilled, and frozen forms.

^ Figures are aggregated based on fresh and chilled forms.

WHOLESALE/AUCTIONED* PRICES FOR PRIMARY PRODUCE (\$/KG) (JAN TO DEC EACH YEAR)



Price (\$/kg)	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
▲ High Value Fish	\$15.17	\$14.85	\$14.62	\$16.64	\$16.22	\$17.29	\$19.40	\$18.97	\$17.00	\$17.36
▲ Medium Value Fish	\$4.96	\$5.41	\$5.18	\$5.79	\$5.72	\$5.88	\$6.50	\$6.98	\$7.10	\$7.13
▲ Low Value Fish	\$2.55	\$3.50	\$2.92	\$2.89	\$3.10	\$3.60	\$3.70	\$3.99	\$4.49	\$4.84
▲ Pig*	\$3.60	\$4.05	\$3.59	\$3.59	\$4.39	\$4.15	\$4.17	\$4.35	\$4.24	\$4.53
▲ Chicken	\$2.27	\$2.10	\$2.15	\$2.41	\$2.33	\$2.17	\$2.34	\$2.04	\$2.27	\$2.22
▲ Duck	\$2.24	\$2.70	\$2.91	\$2.71	\$2.63	\$2.60	\$2.69	\$2.74	\$2.80	\$2.75

Note:

High Value Fish: Average wholesale price of fish that are above \$20/kg

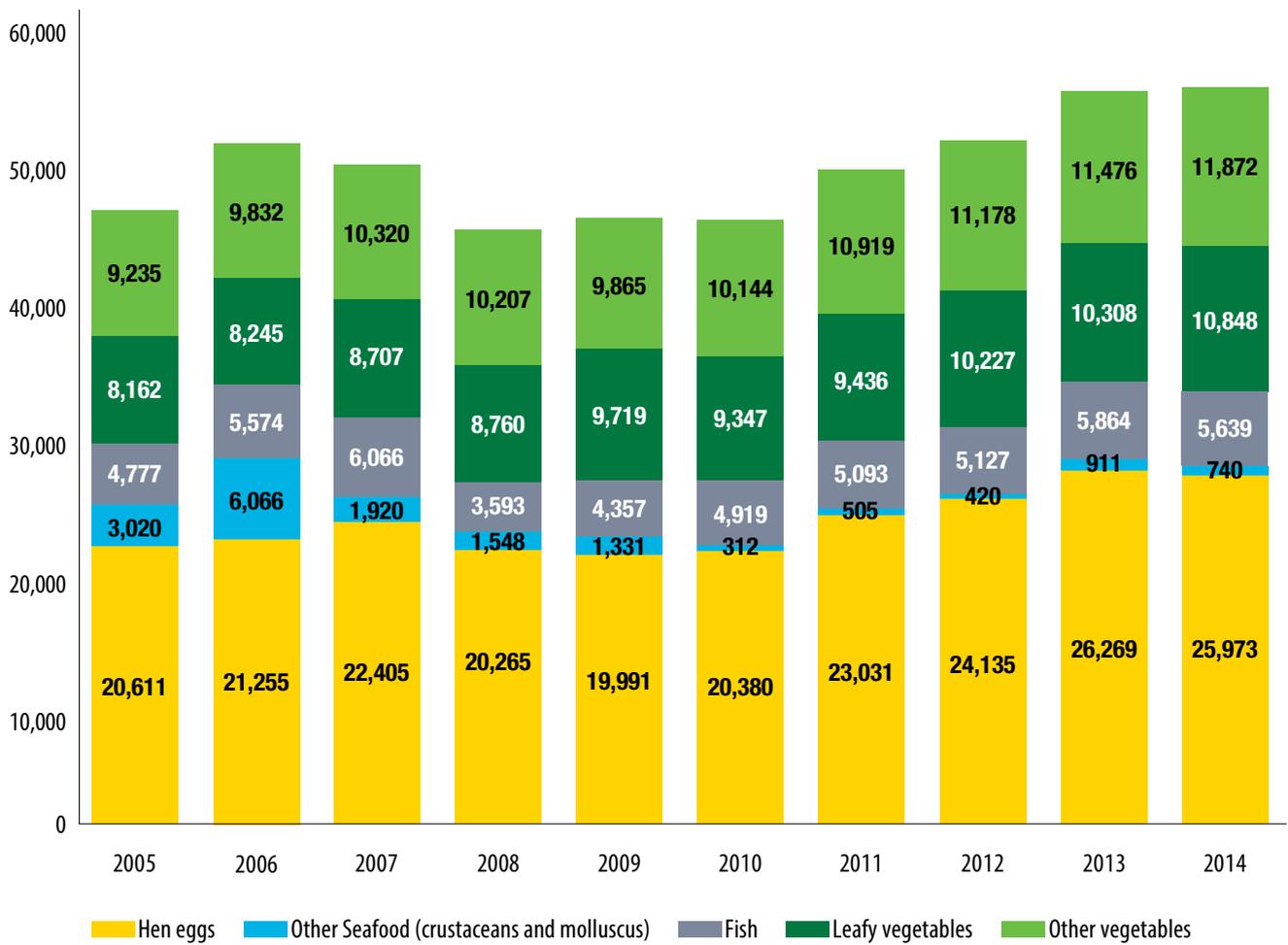
Medium Value Fish: Average wholesale price of fish that ranged between \$10/kg and \$20/kg

Low Value Fish: Average wholesale price of fish that are below \$10/kg

Pig: Auctioned prices obtained from pig abattoir

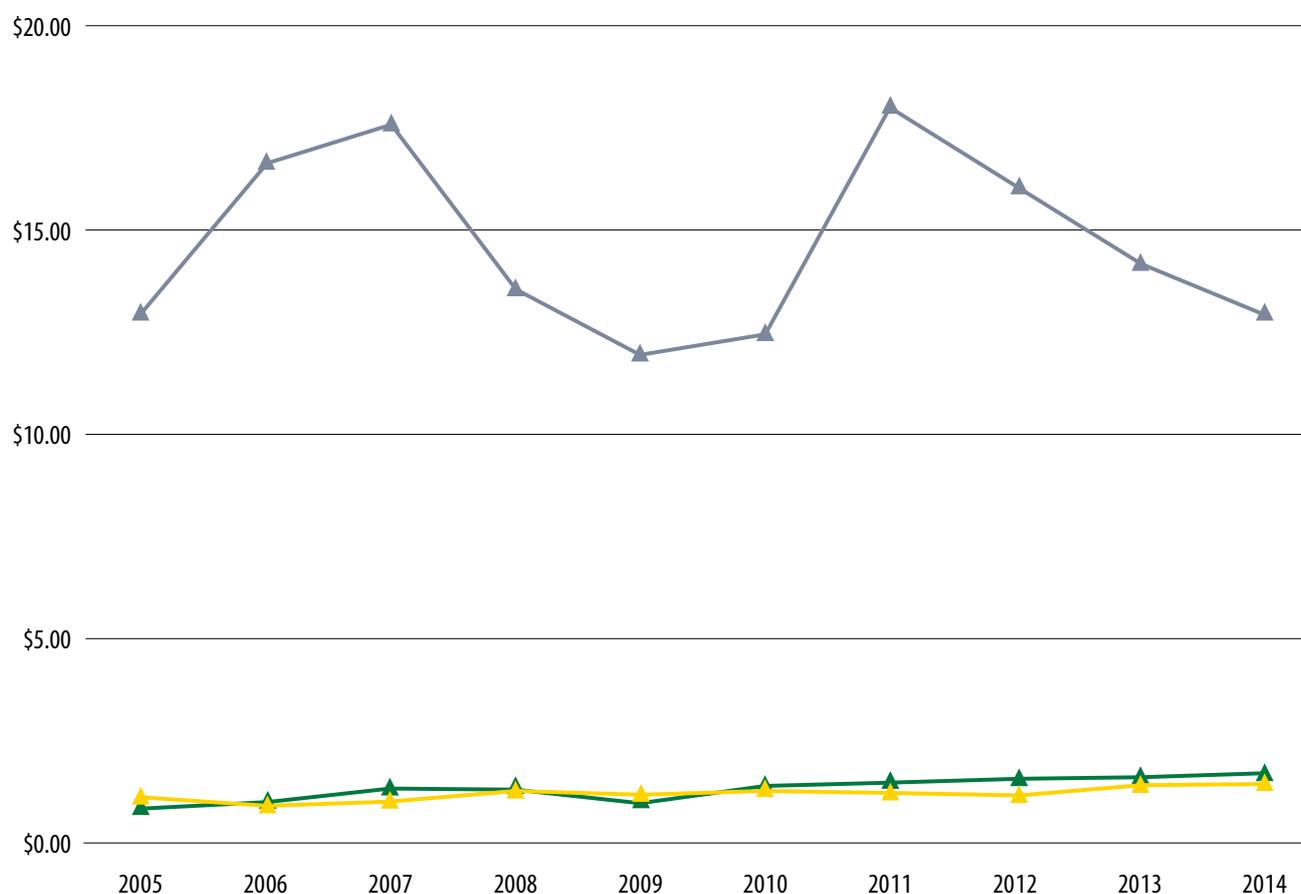
Chicken and Duck: Wholesale prices obtained from poultry slaughterhouses

QUANTITY OF LOCAL PRODUCE (TONNES) (JAN TO DEC EACH YEAR)



Note:
 Local production of seafood includes coastal/ land-based farm production and local landings.
 For hen eggs it is estimated that a piece of hen eggs is 60g.

EX-FARM PRICES OF LOCAL PRODUCE (\$/KG) (JAN TO DEC EACH YEAR)



Price (\$/kg)	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
▲ Hen eggs	\$1.12	\$0.97	\$1.07	\$1.22	\$1.20	\$1.23	\$1.21	\$1.19	\$1.34	\$1.45
▲ Leafy vegetables	\$0.96	\$1.02	\$1.24	\$1.33	\$1.09	\$1.34	\$1.50	\$1.57	\$1.61	\$1.63
▲ Fish	\$13.04	\$16.84	\$17.82	\$13.77	\$12.02	\$12.51	\$18.09	\$16.22	\$14.31	\$13.00

Note:

Ex-farm prices of fish are collected from coastal fish farms.

This legend is applicable to the food-related statistics.

NAME	FORMS
Seafood	fish, molluscs & crustaceans of live, chilled and frozen
Fish	live, chilled and frozen
Other seafood	molluscs and crustaceans of live, chilled and frozen
Vegetables	fresh, whole (including leafy vegetables)
Leafy vegetables	fresh, whole
Fruits	fresh, whole
Poultry	chicken and duck of fresh and frozen
Chicken	fresh and frozen
Duck	fresh and frozen
Livestock	mutton and beef of chilled and frozen & pork of fresh, chilled and frozen
Mutton	chilled and frozen
Beef	chilled and frozen
Pork	fresh, chilled and frozen
Hen eggs	hen shell eggs

ACCREDITATIONS, SUSPENSIONS AND RE-INSTatement OF PIG AND POULTRY FARMS (FY 2014)

	Farm Type					Total
	Pig	Chicken Broiler	Duck Broiler	Chicken Layer	Chicken Breeder	
No. of New Farms Accredited	0	0	2	1	0	3
No. of Farms Suspended / Delisted	0	11	6	4	0	21
No. of Farms Reinstated	0	5	3	0	0	8
No. of Inspection Visits	12	8	10	9	0	39

Note: Some of the broiler farms were reinstated based on documentary evaluation without on-site inspection.
Farms suspended due to SE, drug residues and major non-compliance with export conditions.

TRADE DOCUMENTATION AND IMPORT INSPECTION FIGURES (FY 2014)

	Meat and Meat Products	Fish and Fish Products	Fruits and Vegetables	Processed Food
No. of Traders Registered		2,625	1,062	9,499
No. of Import Permits Issued	21,775	196,383	239,060	403,049
Quantity and Value of Products Approved for Import	296,665.25 tonnes \$1,323,935,360.86	205,086.52 tonnes \$1,370,836,227.65	968,005.00 tonnes \$1,276,173,823.59	4,022,262.46 tonnes \$1,296,431,688.55

ILLEGAL IMPORTS INTERCEPTED (FY 2014)

	Meat and Seafood	Fruits & Vegetables	Poultry Eggs	Animals and Birds	CITES	Processed Food
Total no. of Cases	26	23	1	14	18	565
No. Prosecuted in Court	1	0	0	7	2	1
No. Compounded	9	22	0	2	9	7
No. Warned	16	1	1	5	1	542
Others (relevant particulars not available, no action required)	0	0	0	0	6 (pending investigations)	15

FARMING ACTIVITIES IN SINGAPORE (FY 2014)

Farm Type	No. of Farms	Net Area (Hectares)
Fish		
Aquarium fish (breeding/export)	65	142.1
Marine/Freshwater Food-fish And Shrimp (land-based)	9	34.2
Animals and Birds		
Layer (hen eggs)	3	48.2
SPF eggs	-	-
Quail and other game birds	2	4.7
Exotic birds	4	8.3
Dairy cattle and goats	4	9.4
Frogs and crocodiles	3	11.7
Dogs (breeding/ boarding/ training) / Commercial pet boarding	29	9.5
Plants		
Vegetables	54	113.9
Food Crops	1	5.1
Bean Sprouts	6	6.4
Mushroom	2	3.4
Orchid and ornamental plants	75	246.6
Aquatic plants	1	11.7
Fodder crops	1	4.7
<i>Jatropha</i> cultivation for bio-fuel research	1	1.7
Total (land-based)	260	661.6
Foodfish/crustaceans/molluscs (sea-based)	117	103



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