

# AVA VISION

Issue 2/2017

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## A NEW APPROACH TO FARM LAND TENDERS

To bid, farms must submit proposals outlining how their productivity will be maximised.



Food security is a subject that is pertinent to Singapore. Most of the food we eat comes from overseas. Take leafy vegetables for example. Local farms produced about 11,000 tonnes of it in 2016. This amounted to 10 percent of the nation's total consumption.

Our reliance on imports must be effectively balanced with a greater measure of self-sufficiency that can reduce the impact of any food supply disruption. On the other hand, the limited availability of farm space in Singapore poses a constant challenge – there are competing requirements for housing, industry, defence, transport, port and maritime activities.

Food farming will continue to be important to us, even as our space becomes more urbanised. With the Government's aim to boost local supply and at the same time maximise land usage, farms must be able to provide Singapore with even more food. The output per square foot needs to be significantly increased.

This is why the Agri-Food & Veterinary Authority of Singapore (AVA) has adopted a new approach to the tenders for agriculture land meant for growing food.

*“A modern agriculture sector will continue to play a key role in Singapore's future, even as our economy evolves and our society becomes more urbanised.”*

**Mr Lawrence Wong**  
**Minister for National Development**  
**(in his blog post dated 9 May 2017)**

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■ This machine helps Seng Choon to detect eggs that are cracked.

### **New approach to land tenders for food farms**

AVA will be releasing 36 plots of farmland in Lim Chu Kang and Sungei Tengah for tender. The plots will be released in tranches over the next two years. The tender for 12 land parcels for vegetable farming in Lim Chu Kang was launched on 17 August 2017. All plots will be let on 20-year leases.

In line with the direction of the Farm Transformation Map announced in March 2017, the tender process will steer local farming towards technology adoption and a high level of sustained intensity. The new farm land will be tendered using new methods:

#### **a) Fixed price tender method**

(for leafy vegetable, food fish, bean sprout, and quail egg farming). The land price is fixed and bidders compete purely on the tender proposals submitted.

#### **b) Concept and price tender method**

(for general agriculture food farming). Bidders who meet the evaluation criteria are shortlisted. The tender would then be awarded to the shortlisted bidder with the highest bid price.

The evaluation of bids will hinge heavily on the quality of proposals, which must outline the measures each farm plans to take in maximising productivity.

Concept proposals submitted by prospective farms will be evaluated according to the following criteria:

- i. The ability to achieve high production levels.
- ii. The ability to achieve projected production levels based on past performance.
- iii. Relevant experience and qualifications.
- iv. The ability to use innovation to improve and sustain production, and maintain business viability.

AVA recognises that some farmers may not be familiar with the new tender process, as the bid for farm lands had traditionally been based on price. To help farmers, AVA will conduct advisory sessions on how to draft proposals before every tender is launched.



Scan to read more about the locations, sizes, and launch periods of the various land plots

## HOW DOES AVA HELP FARMERS SCALE UP ON TECHNOLOGY AND PRODUCTIVITY?



■ *Top: An example of our technology transfer and technical support: AVA worked with a local farm to successfully breed Jade Perch locally and develop the culture protocol for fry production.*

■ *Bottom: Senior Minister of State Dr Koh Poh Koon (in red) with a delegation of Singapore's farmers and public officers at an indoor vertical farm in China.*

### Funding Support

Farmers are encouraged to tap into AVA's \$63-million Agriculture Productivity Fund (APF) to implement or plan for farm upgrades and R&D. To give farmers a more instantaneous boost, from April 2017, APF disburses 30 percent of the approved funding quantum upfront to facilitate the adoption of new technology.

### Transfer of Technology

Scientists and technologists in AVA are constantly researching on agricultural technology that suits the needs of local farms. We also work with the private sector to develop innovative solutions and test-bed farming technologies. Findings from our studies and trials are regularly shared with local farmers. For example, AVA has been inviting farmers to learn about our ongoing research on indoor multi-tier farming systems. In addition, we organise technology-matching sessions between farmers and solution providers.

### Technical Support

We provide technical advisory on good farm management practices and disease management. AVA also offers a helping hand to farms that require technical assistance in setting up new systems or technologies. In addition, technology matching sessions are conducted to introduce farmers to solution providers and technology developers.

### Dedicated Account Managers

Beginning April 2017, each farm has been assigned a dedicated account manager from AVA, who provides targeted advice on matters such as business development, technology adoption, and financial assistance. He/she also facilitates each farm's interactions with various agencies and stakeholders.

### Overseas Study Trips

AVA has been assisting farmers to keep abreast of new farming technologies by organising trips to countries that are highly urbanised.

Together with industry members and relevant public agencies, we recently visited Beijing and Zhongshan, as well as cities in Hainan and Yunnan provinces, in April 2017. Participants learned how farms in these areas reap the benefits of cultivating vegetables without soil mediums, using the Internet-of-Things approach to create greater ease in farm management, and installing sensors and advanced monitoring systems.



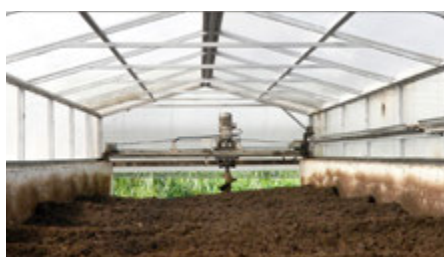
## FARMS TRANSFORM, AUTOMATE & INNOVATE

Commercial intensive farming can be laborious. By applying automation and innovation, farms can reduce manual toil and improve both the yield and quality of farm produce.

Leafy greens grower Kok Fah Technology Farm (KFTF) is among the farms making headway in leveraging new technology to produce more. Mr Wong Kok Fah and his brothers succeeded their father's vegetable farming business in 1979. Today, the farm is run by the second and third-generation family members. Throughout the years, KFTF has been a forerunner in test-bedding and adopting automation and innovation. Some examples include:

- **Drip irrigation-cum-fertilisation ('fertigation') system**

A trial that combines and automates both watering and fertilising processes. This trial is part of larger research on cultivating vegetables using multi-tier structures and coco peat (a combination of coconuts husk fibre and decomposing plant materials).



- **Automatic earth flow composting**

Helps to transform vegetable waste into high quality compost, which speeds up crop cycles and adds more harvest cycles. It also cuts down the time needed to generate compost from 30 days to 1 day.

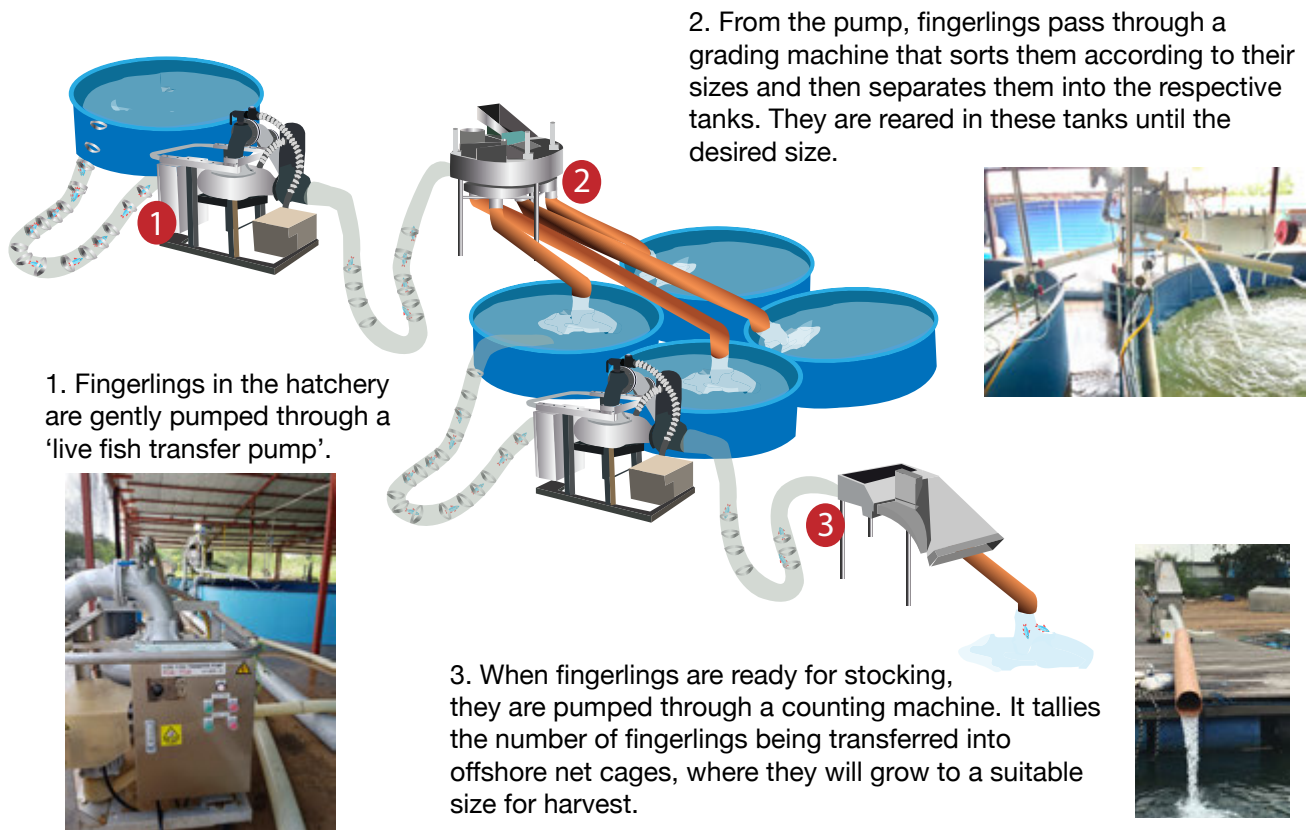


- **Mechanisation of the seeding process**

Reduces manpower needs and increases vegetable growth rate by 20 percent.

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## Marine Life Aquaculture's Automated Pump-Grade-Count System



### Marine Life Aquaculture

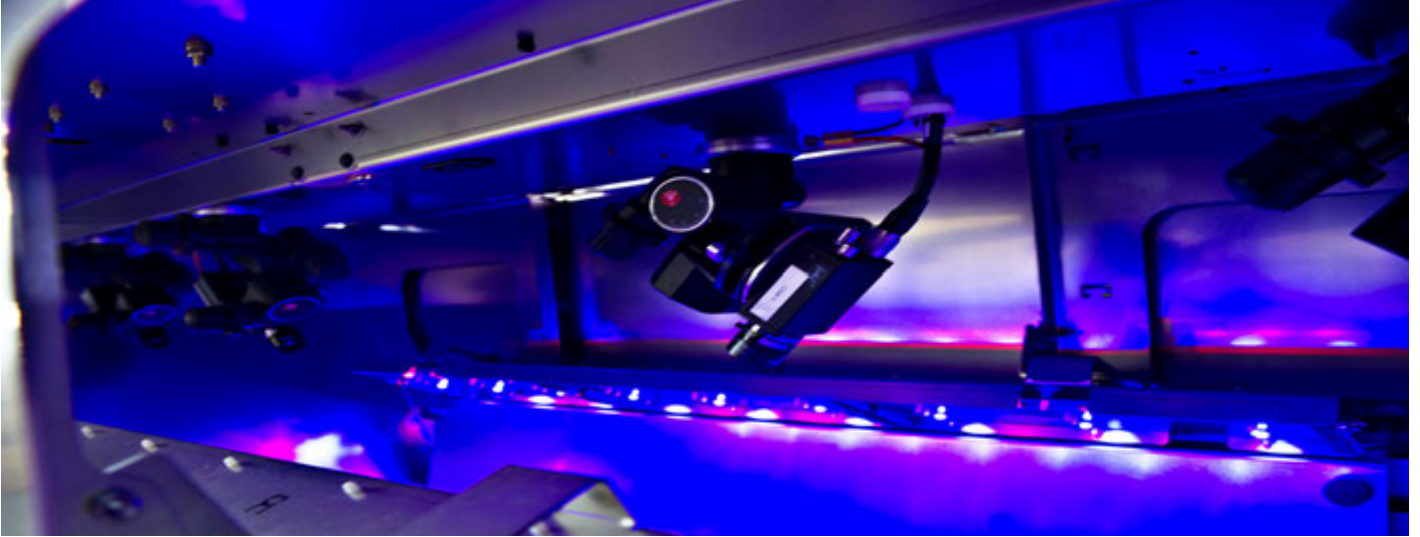
Technology and automation is truly the way to go in increasing productivity. Marine Life Aquaculture used to manually transfer 100,000 fish fingerlings from land to offshore sea cages 100 metres away. That process took one week. With a new live fish pump, the process is automated and takes just one day. Integrated with imaging and scanning technology, fingerlings can also be automatically graded and counted.

### Farms in Singapore are growing more intensive

2007	vs	2016
373 million		452 million
2,584 tons		4,851 tons
8,707 tons		11,355 tons

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■ Seng Choon innovatively applies photo-imaging technology to sift out dirty eggs before packing them for sale. Such automation ensures accuracy and requires little manpower.



■ A robot at Seng Choon transfers and stacks trays of eggs onto pallets for delivery.



■ Seng Choon's feed mill conveyor system automatically delivers chicken feed into the bio-secured poultry houses.

### Seng Choon Farm

Established in the 1980s, Seng Choon is another long-surviving Singapore agricultural business that has become more productive than ever. In its farm, the climate-controlled poultry housing system allows for automated feeding, egg collection, and manure collection. Elsewhere in the production process, an egg grading machine ensures that only quality and clean eggs are selected for sale, while a robot helps with packing. Over the years, Seng Choon has increased its production by 30 percent without increasing its personnel headcount.



Tap into AVA's Agriculture Productivity Fund (APF) for farm upgrades and R&D. Scan and find out more about APF.



## THAILAND: AN ADDED SOURCE OF POULTRY & EGGS

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In order to ensure a resilient supply of safe food, we need to continuously diversify our food sources. This includes exploring new potential sources, and Thailand is one such country that Singapore can import more food from.

Currently, Singapore imports close to 180,000 tonnes of live and frozen chickens annually, most of them from Brazil, Malaysia, and the United States. As for the 1.4 billion hen eggs we imported last year, the majority came from Malaysia, and a fraction from New Zealand.

AVA has been actively exploring additional sources for these food items over the years, so as to enhance food supply resilience. In this regard, Thailand, a substantial producer of poultry, is a potential choice.

Thailand used to be an important source of frozen poultry for Singapore until it was hit by Bird Flu in 2004. AVA suspended these imports to safeguard public health. However, since 2008, Thailand has put in place effective disease control measures and kept Bird Flu out. As such, AVA worked closely with Thai authorities to resume the export of Thai frozen poultry to Singapore.

During an inspection mission in 2012, we verified the disease control situation and evaluated the effectiveness of sanitary control in Thailand. In 2013, AVA approved the

import of frozen chickens from two establishments in Thailand, which were able to meet our import requirements. These products have been sold here since 2014.

### More Sources of Thai Poultry

To expand our network of frozen poultry suppliers in Thailand, AVA led Singaporean importers to visit and assess prospective establishments there in 2016. Following the trip, AVA approved 23 more slaughterhouses in Thailand to export frozen chickens, ducks, and geese to Singapore, up from two previously.

### First Import of Thai Eggs

AVA and the industry are also keen to source for hen shell eggs from Thailand, which had never been exported to Singapore before. Following satisfactory documentary evaluation, site inspections by AVA, and laboratory results submitted by Thailand's Department of Livestock Development, two layer farms were approved in March 2017 for export of table eggs to Singapore. The first shipment of 325,000 hen shell eggs from Thailand arrived in Singapore in April 2017.



## USING NASA TECHNOLOGY TO EXTEND SHELF-LIFE

Space technology in air purification keeps fruits and vegetables fresh for a longer time.

Temperature, humidity, and air quality are key factors that affect the shelf-life and quality of fresh produce. Undesirable odours, microorganisms (such as bacteria, mould and fungi), and ethylene gas can alter the quality of air, thus shortening shelf-life.

Ethylene gas is a naturally occurring ripening agent in certain fresh produce. It can accumulate in food warehouses and cold stores. Ethylene-sensitive produce such as berries, asparagus, broccoli, and lettuce ripen and deteriorate more quickly when they come into contact with this gas.

This problem is compounded by the fact that fresh fruits and vegetables are fast-moving goods; operators may not find time in between consignments to clear and decontaminate their premises.

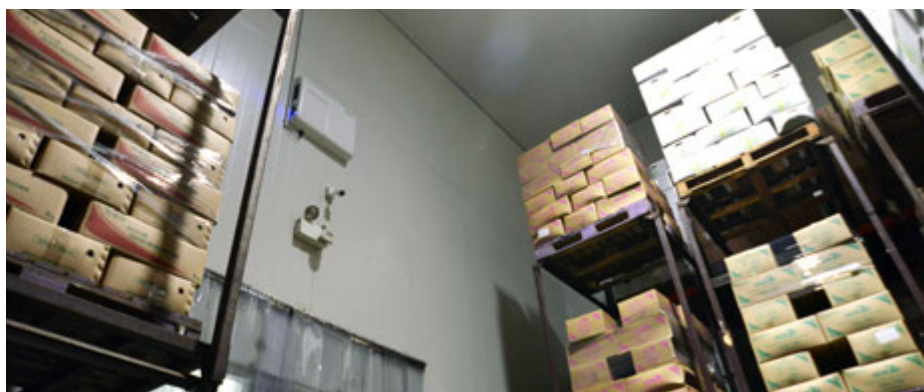
To overcome the adverse effects of ethylene accumulation, there are various air purification systems that help to improve the air quality. One such system, called Airocide, adopts a technology developed by NASA to purify air using photocatalytic oxidation and ultraviolet light.



■ An AVA officer (left) assists Ban Choon in setting up the air purification system, including monitoring its effects on improving the shelf-life of fresh produce in its store.

This system was tested by Ban Choon Marketing Pte Ltd (Ban Choon) with support from AVA for its effectiveness in maintaining the quality and extending the shelf-life of strawberries and romaine lettuce. Stored in chillers installed with Airocide, strawberries and romaine lettuce could last three to five days longer. This extended shelf-life translates to cost savings due to the reduction in food spoilage.

Besides adopting advanced air purification technology, the industry should also observe good management practices such as segregating ethylene-sensitive produce from ethylene-producing ones. Having good cold chain standards will also help to ensure that food stays fresh for as long as possible.



■ Ban Choon uses an air purification system developed using NASA technology to reduce the amount of ethylene gas in the store.





### SIGNING OF PARTNERSHIP AGREEMENT FOR INTEGRATED PIG FARM IN JILIN FOOD ZONE

On 24 April 2017, Senior Minister of State (SMS) for National Development & Trade and Industry, Dr Koh Poh Koon attended the signing ceremony of a partnership agreement for the Integrated Pig Farm in Jilin Food Zone. The consortium of Singapore companies - Ascendas-Singbridge and SATS - and Charoen Pokphand of Thailand will develop an integrated value chain for pork production in Jilin. Modern and environmentally sustainable pig farms, an abattoir, as well as a high-end processing plant, will be developed.

AVA's subsidiary, Agri-Food Technologies Pte Ltd (ATP), has been providing consultancy services to the Jilin City Government to help establish the Integrated Food Safety System in the food zone. AVA officers have also been stationed in Jilin to help guide Jilin City officials as they

set up this system. In addition, we have been assisting in the maintenance of Jilin's Foot-and-Mouth Disease-Free Zone.

Eventually, the Jilin Food Zone can also produce corn, vegetables, dairy products, and fish, along with the pork that Singapore expects to import from the integrated pig farm.



Scan to read more about Dr Koh's opening speech at the ceremony



Scan to watch a video of Dr Koh's opening speech

### NEW AMENDMENTS TO FOOD REGULATIONS COME INTO EFFECT

AVA constantly reviews and updates its Food Regulations, in order to ensure food safety while facilitating trade at the same time. In these reviews, consultation exercises are held to gather comments from the industry and public before any amendments are made.

The recent amendments to the Food Regulations took effect on 1 April 2017. The majority of the amendments are related to the use of new additives, expanded use of existing additives and health claims, as well as stricter requirements to better protect public health. These amendments are in line with the latest scientific and regulatory developments in international standard-setting bodies.

The following are a few examples:

- Flavour enhancer L-theanine is allowed for use (within permissible levels) in brewed tea, soft drinks, chocolates, and candy. (Previously, popular brewed tea drink 'Chun Cui He' was briefly pulled off shelves in Singapore as it contained L-theanine which was not yet permitted for use in Singapore. This has since been revised once its safety as an additive was established.)

- Quality criteria for sesame oil and sunflower seed oil have been revised.
- A maximum limit for inorganic arsenic in polished rice is introduced, and the maximum lead level in infant formula is reduced.
- Beta-palmitin is permitted for use in infant formula.
- A health claim relating to barley beta-glucan is allowed: "Barley beta-glucans have been shown to lower/reduce blood cholesterol. High blood cholesterol is a risk factor in the development of coronary heart diseases."



Scan to view full list of the Food (Amendment) Regulations 2017



## REGULATIONS CONCERNING FORMULA MILK TO BE REVIEWED

During a Parliamentary session in May 2017, SMS Dr Koh Poh Koon spoke about the rising prices of formula milk in Singapore, and the Government's plans to address concerns over this issue. Dr Koh also added that he will lead a taskforce of various agencies, including AVA, to put in place key measures by the end of 2017.

AVA will be amending advertising rules such that the code of ethics governing formula milk for infants below six months of age will be extended to cover those for infants up to 12 months old, while also taking international best practices into consideration. AVA will also tighten labelling and advertising regulations on formula milk; health claims and images promoting formula over breast milk will be prohibited.



## REVISED LICENSING CONDITIONS FOR PET BUSINESSES

Following months of consultation with stakeholders, AVA introduced new rules governing licensing for pet businesses on 1 April 2017. The rules were made to improve the housing, management, and healthcare of animals, and will enhance the traceability of animals as well as accountability of the pet businesses concerned. Examples of the changes include:

- If two or more dogs are kept together, they must be compatible, and each dog must be able to move and turn around without hitting the sides of the kennel, stand upright, lie down, and stretch.
- All retired breeding dogs must be kept separate from currently breeding dogs and segregated according to gender.
- Puppies must be microchipped by nine weeks old and kittens microchipped by 12 weeks old.
- All breeding dogs must undergo an annual health check by a licensed veterinarian.

For the full list of revised licensing conditions, please see: <http://bit.ly/pet-businesses>

## CODE OF ANIMAL WELFARE (FOR PET OWNERS) ISSUED

AVA's Code of Animal Welfare (for Pet Owners) took effect on 15 June 2017. The code provides minimum standards for accountability of pet owners, as well as for the housing, environment, management, and care of the animals. Pet owners are expected to comply with these standards, which apply to all pets unless otherwise stated. Although failure to meet a minimum standard in the code is not an offence, it can be used to support prosecution or other enforcement actions for animal welfare cases.

The code is available on AVA's website at [www.ava.gov.sg/codepetowners](http://www.ava.gov.sg/codepetowners).

## AVA HOLDS INTERNATIONAL TRAINING COURSES ON RESIDUE ANALYSIS

One of the roles of AVA's Veterinary Public Health Laboratory - as the World Organisation for Animal Health (OIE) collaborating centre for food safety and the appointed ASEAN Food Reference Laboratory for pesticide residues and environmental contaminants - is to provide training and enhance laboratory testing capabilities in the region. AVA has also been invited by the International Atomic Energy Agency (IAEA) to host workshops on pesticide and veterinary drug residue analysis. Playing our part in these roles, we organised the following activities.

### **Nov 2016: ASEAN-China workshop on the 'Detection of Drug Residues in Seafood Products'**

Through lectures and hands-on sessions, ASEAN member countries gained technical insights into the detection and confirmation of veterinary drug residues in seafood products. The workshop covered method development using HPLC-MS/MS, analytical method validation, laboratory quality assurance, and quality control.

### **Mar 2017: Training on 'Basic Maintenance and Troubleshooting of Food Safety Analytical Instrumentation Including Effective Uses of Instrument Software'**

Singapore was invited to be the lead country in IAEA's regional technical cooperation project, which aims to enhance food safety laboratory capabilities as well as establish a network in Asia to control the use of

veterinary drug residues and related chemical contaminants. In support of this project, AVA's training programme covered screening and advanced confirmation techniques, as well as the use, basic maintenance, and troubleshooting of relevant instruments.

### **May 2017: Training on pesticide residue analysis**

Singapore leads the Pesticide Residues Working Group (under IAEA's interregional technical cooperation programme) in generating reliable data that will help set the pesticide residue standards for minor crops. As part of this working group, AVA invited delegates from Asia, Africa, and Latin America to participate in lectures and laboratory practical sessions related to pesticide residue analysis.



## AVA'S THE PAWFECT MATCH @ PET EXPO 2017

The 'Pawfect Match' activity by AVA and 10 animal welfare groups\* took place at the Pet Expo 2017 from 14 to 16 April. Taking the format of speed-dating events, the 'Pawfect Match' activity allowed potential pet owners to interact with and learn more about the 100 dogs, cats, and rabbits that were available for adoption.

With pet owners making up the bulk of visitors, the event was also a suitable platform for AVA to push out Responsible Pet Ownership (RPO) messages. These include advice on leashing and picking up after dogs, keeping pets indoors, and pet sterilisation. Educational and interactive exhibits were set up throughout the showgrounds to illustrate these messages. Pet owners





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were also encouraged to take photos with AVA exhibits and share our RPO messages on social media.

*\*These 10 Animal Welfare Group were: Animal Lovers League, Action for Singapore Dogs, Causes for Animals Singapore, Exclusively Mongrels, Noah's Ark CARES, Mercylight, SOSD Singapore, Society for the Prevention of Cruelty to Animals, Cat Welfare Society, and House Rabbit Society Singapore.*



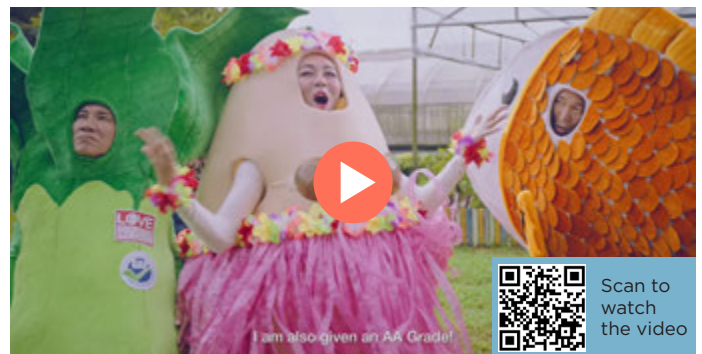
Scan to view  
a montage of  
photos taken at  
Pet Expo 2017



## FOOD TRUCK ROADSHOWS AND NEW VIDEO DRIVE HOME MESSAGE OF SUPPORTING LOCAL PRODUCE

AVA organised its third series of food truck roadshows at SPH News Centre, Mediapolis, Biopolis Epicentre, and Mapletree Business City from 14 to 22 March 2017, reaching out to some 12,000 working professionals. Many visitors took photos of themselves with the complimentary sample dishes offered, which were created using locally farmed eggs, fish, and vegetables. These photos, tagged #loveSGproduce, were uploaded to their Facebook and Instagram accounts.

In addition, as part of efforts to raise awareness of local produce, a video featuring three actors from the 'Take 2' movie was produced, reaching over 15.6 million impressions and 608,000 YouTube views within a month of its launch.



Scan to  
view photos  
taken at the  
food truck  
roadshows



Scan to  
watch  
the video



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