

AVA VISION

Issue 1/2018

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STEERING THE FUTURE OF FARMING

AVA does so through new land tendering methods, funding enhancements, talent programmes, R&D transfer, and the promotion of local produce.



Land-scarce Singapore produces limited amounts of food for local consumption, with more than 90 percent of what we eat coming from abroad. The Agri-Food & Veterinary Authority of Singapore's (AVA) efforts in diversifying food sources have continued to ensure a stable supply of imports. However, global developments such as a growing world population, vagaries of the weather, and the rise of emerging economies, will have an impact on our food supply.

According to the United Nations, the current world population of 7.6 billion people is expected to reach about nine billion in 30 years. This global population growth will lead to greater demand for food.

At the same time, traditional farming methods are challenged

by climate change around the world. Also, farmlands are giving way to urbanisation in emerging economies. These put added pressure on food production, leading to concerns that supply may not keep up with demand.

New farmland tendering method focuses on productivity

To be less reliant on imports and to mitigate any disruptions to our food supply, it is important for Singapore to increase local production by leveraging on technology. Just as the factors affecting food production are rapidly changing, our farms too must transform. AVA has taken steps to steer the future of farming and nurture the next generation of farmers.

■ *Sustenir: A local indoor farm that leverages on technology to circumvent the constraints of space, climate, and labour. (Photo: Sustenir)*

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Starting in August 2017, the government has been progressively releasing 36 farm plots in Lim Chu Kang and Sungei Tengah for tender on 20-year leases. This was the first time that AVA tendered out farmland using the ‘fixed price’ tender method, where the land price was set up-front and the bidders competed solely on concept. This method ensures that the agriculturalists with the best concept proposals win. It provides innovative and technologically-savvy agri-specialists with the opportunity to transform their old systems, adopt new techniques, and play a part in shaping Singapore’s agricultural model.

On 9 February 2018, 10 vegetable farmland parcels were awarded to eight companies in the first tranche of farmland sales. These companies submitted proposals that incorporated productive and innovative farming systems. Examples include greenhouses with automation and smart controls; multi-tier hydroponic systems using LED lights and data analytics to optimise growing conditions; and multi-storey farms that use automated soilless cultivation system and robotics.

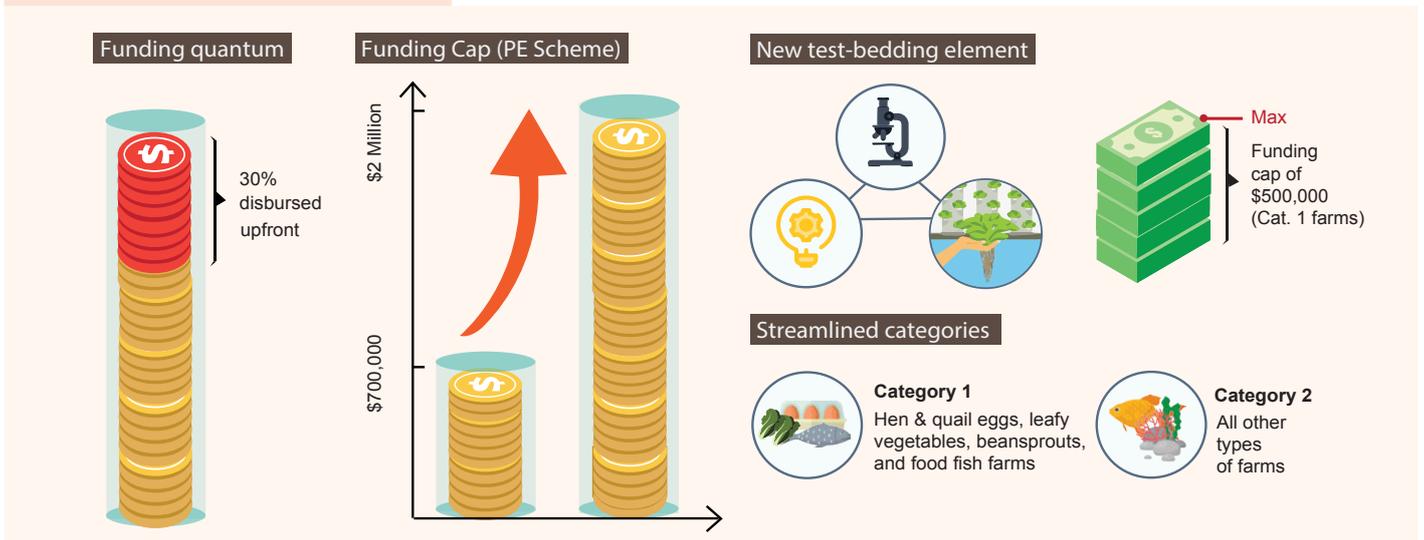
Enhancements to Agriculture Productivity Fund

To encourage more people to follow the footsteps of these progressive farms, the government has also been providing assistance and support in various forms, one of which is funding. The \$63-million Agriculture Productivity Fund (APF) was launched in 2014 to help local farmers develop farm capabilities, improve productivity, and conduct R&D on innovative production technologies.

In April 2017, AVA updated the APF to disburse up to 30 percent of the approved funding quantum upfront (capped at \$100,000) to help farms with their cash flows. And in March 2018, based on feedback from farmers, these additional enhancements were made:

- Funding cap of projects under the Productivity Enhancement (PE) scheme (Category 1) is raised from \$700,000 to \$2 million.
- PE scheme now includes a new test-bedding element, with a funding cap of \$500,000 for Category 1 farms, and \$100,000 for Category 2 farms.
- Farm categories are streamlined from three to two.

APF ENHANCEMENTS 2017 & 2018 *As at March 2018





■ Ms Felestine Chong (supervisor at Apollo Aquaculture Group) shows Mr Eddy Chew (student intern from Republic Polytechnic) how to use a probe to test water quality in the farm.

Nurturing a future generation of agri-talents

Beyond technologies and equipment, Singapore also needs to build a local pool of talents for farms of the future. Farming has to be seen as a viable career option so as to attract a future generation of locally bred agri-specialists.

To this end, AVA has begun working with farms and two polytechnics to develop structured internship programmes. The internship allows students to apply their knowledge and practical skills learned at school. Some 20 students from the aquaculture discipline in Temasek Polytechnic and Republic Polytechnic have been placed in internships at 10 local fish farms.

In addition, Temasek Polytechnic added a new aquaculture course to its list of SkillsFuture Earn and Learn work-study programme. It targets graduates from Institutes of Technical Education who wish to deepen their skills in the aquaculture industry. Under this

12-month course, farms receive up to \$15,000 worth of incentives to defray the cost of training each course participant. Six of our food fish farms have already pledged their support for this programme. Participants also have the option to further take up the remaining modules required to obtain a Diploma in Applied Science (Aquaculture).

Sharing AVA's R&D expertise

AVA's scientists and technologists are constantly researching on and developing agri-tech solutions that suit local farms. For example, in recent years, AVA has helped local fish farms reduce their reliance on imported fish fry, by successfully breeding the Crimson Red Snapper, Sea Bass, Cobia and Jade Perch. Through AVA's technical assistance and workshops, some farms have already developed the capability to produce their own fish fry. This helps to mitigate their susceptibility to overseas supply fluctuations.



■ Trials on indoor multi-tier planting systems being conducted at AVA's Sembawang Research Station.

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■ Minister for National Development Mr Lawrence Wong (3rd left) and AVA CEO Mr Lim Kok Thai (far right) with founding members of SAFEF.

In terms of vegetable farming, AVA has developed indoor multi-tier planting systems for the production of *xiao bai cai*, *gai lan*, and *nai bai*. Grown in a multi-tiered shelf that uses low-cost fluorescent lighting, productivity increased by up to fivefold. In addition, time taken for transplanting and usage of water were reduced by at least 20 percent and 90 percent, respectively. Efforts are underway to test the use of energy-efficient LED lights in this system. At the same time, the indoor multi-tier planting system is being test-bedded at local farms, along with studies on the use of greenhouses and automation.

We also regularly keep local farmers up-to-date with these developments and match them to potential solution-providers. On 6 March 2018, an aquaculture technology-matching session was organised to enable fish farmers to explore new and emerging innovations that they can adopt.

Garnering support from the community

As our farmers strive to produce more, they will need greater support from consumers. Through efforts like road shows, supermarket promotions, and outreach at schools and work places, AVA educates the public on the merits of choosing local farm produce.

In February, the second SG Farmers' Market event brought 26 farmers together at the Singapore Turf Club, where farmers, chefs, AVA officers, and radio deejays reached out to the public. The event was organised in partnership with the Singapore Agro-Food Enterprises Federation (SAFEF). (Read more about the SG Farmers' Market on pg 12.)

Formed in October 2017, the industry-led, non-profit SAFEF represents agri-food enterprises in Singapore. AVA supports the formation of this federation in its collective effort in addressing common challenges. Initiatives to overcome these challenges will cover the areas of: setting standards and guidelines; raising productivity and lowering costs; developing manpower and capabilities; as well as promoting local produce.

In his Budget speech on 6 March 2018, Senior Minister of State for National Development & Trade and Industry Dr Koh Poh Koon said these efforts will strengthen the ecosystem and the operating environment for our farms. Now is the time for Singapore's agri-technologists to shape the future of our food security, by embarking on innovation and automation.

FARMING IN UNUSUAL SPACES

Modern local farms combine innovation, engineering, and design to revolutionise food production and expand farming to unconventional spaces.

Technology is a key enabler for farm transformation. Next-generation farmers' operations no longer need to be constrained by space, climate, and manual labour. Innovation, engineering, and design will revolutionise food production and strengthen our food security.

Agriculture in Singapore is beginning to transform and shape up to be a modern and creative discipline. We can see that in the successful bidders for the first tranche of farmland sales this year, who will be employing automation, data analytics, robotics, vertical farming and soilless vegetable growing systems to intensify production.

While there are progressive enterprises that operate out of farmlands, some agricultural game-changers are also taking root in unconventional grounds. These

next-generation farmers have shown that with new technologies, food production can take place anywhere in the city.

Indoor, industrial: Sustenir Agriculture

Located in an industrial building, Sustenir Agriculture grows temperate produce such as Tuscan kale, arugula, cherry tomatoes, and strawberries within a tightly-controlled environment. This ensures optimal plant growth, thus halving the time taken for crops to grow, as well as enabling harvests year-round.

In addition to climate control, Sustenir also closely monitors plant growth and materials consumption using a centralised system linked to staff members' smartphones. Staff are alerted to any disruptions to the growth cycle, and can resolve them remotely to prevent failures.

SUSTENIR AGRICULTURE

With

340 sqm



SUSTENIR grows

72 tonnes



of kale and lettuce annually



96% water savings



no pesticide

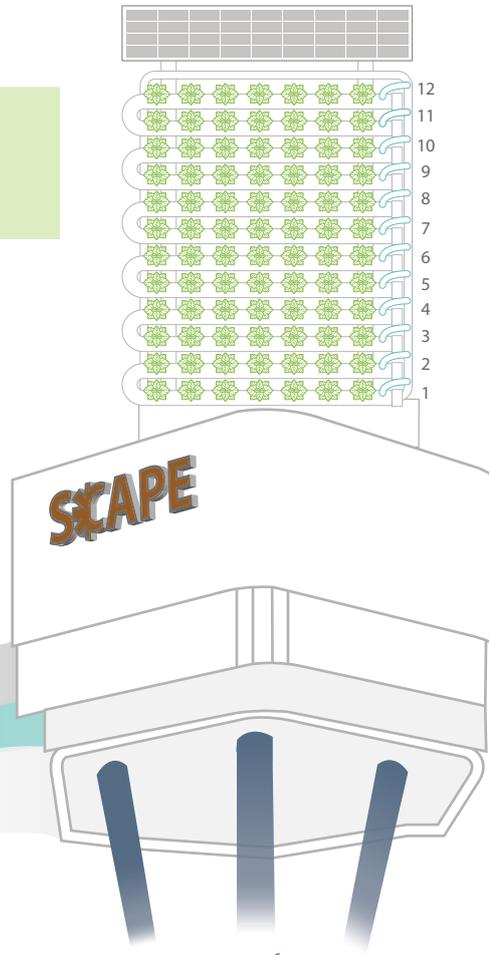


no pollution

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COMCROP

Comcrop's hydroponic system is irrigated by an automatic water pump. There are plans to use solar panels to power the pump.



Urban rooftop: Comcrop

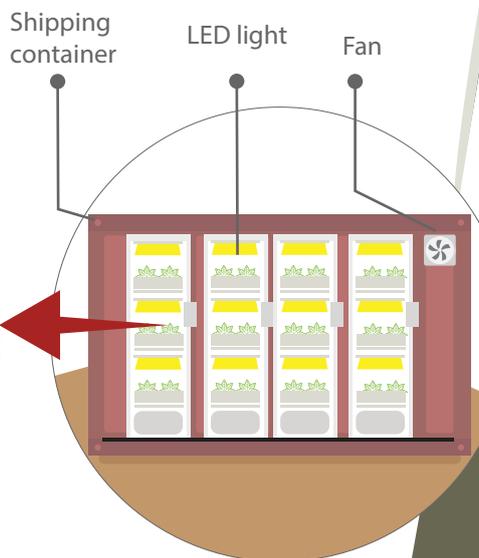
Out of the industrial estate and into the city, Comcrop takes rooftop farming in urban areas to the next level, by further intensifying production vertically. Operating atop the *SCAPE building on Orchard Road, Comcrop uses a 12-tier vertical hydroponic system to increase its production per square metre of space used. Crops are irrigated by an automatic water pump, which could be powered by solar panels in the future to further minimise its environmental impact.

Modular, anywhere: Citizen Farm, Apollo Aquaculture Group, Surbana Jurong

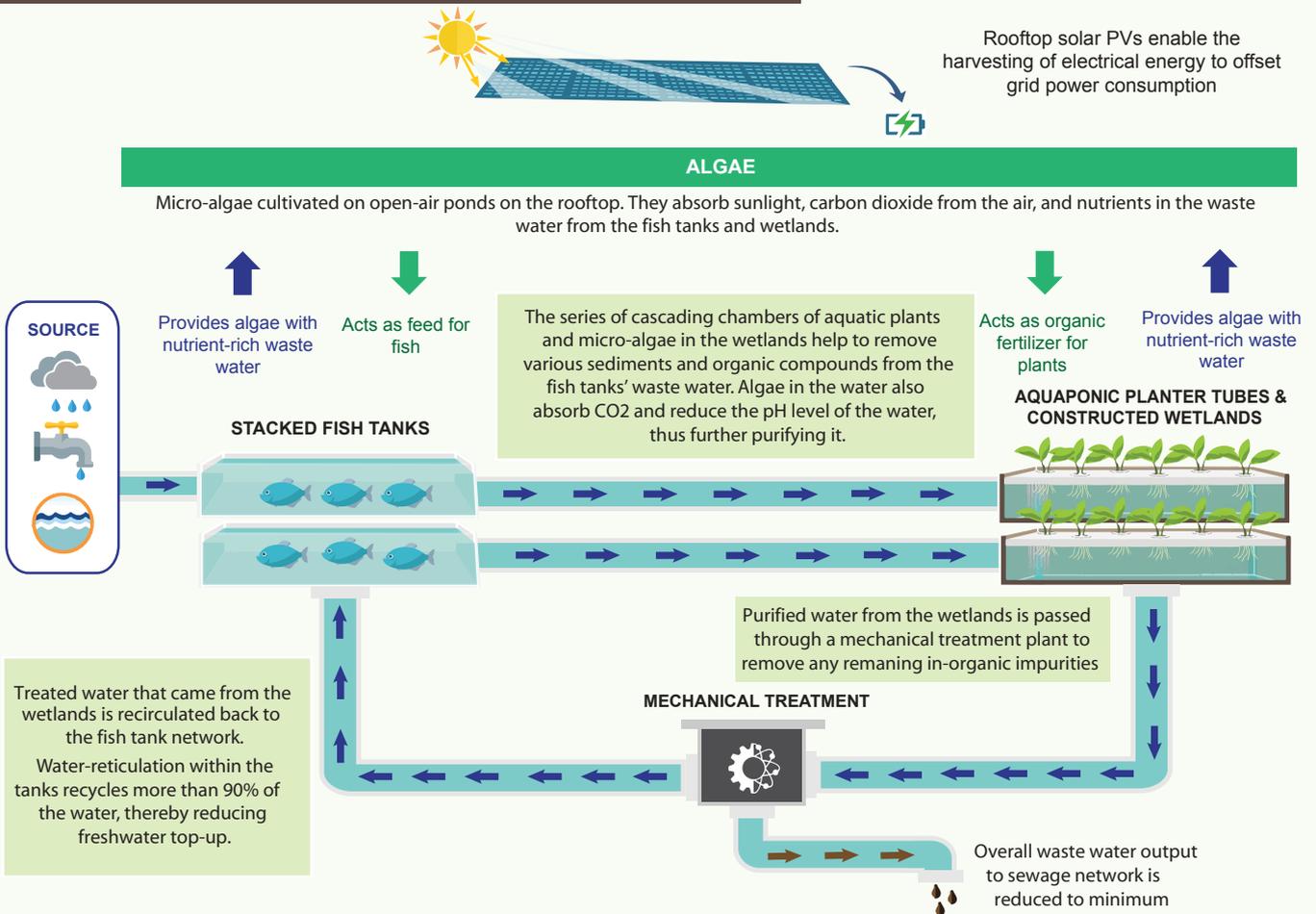
Farming can take place in unexpected and underutilised spaces as well. Citizen Farm piloted a modular farm under the West Coast viaduct for a period of three months in 2017. A variety of vegetables and mushrooms were cultivated on racks fitted by LED lights, inside climate-controlled shipping containers cooled by fans. This system can be placed just about anywhere, from corridors to viaducts.

CITIZEN FARM

Pilot modular farm under a viaduct



SURBANA JURONG AND APOLLO AQUACULTURE GROUP



Besides vegetables, fish can also be grown vertically indoors. Apollo Aquaculture Group (AAG) currently farms fish using three overlaying tiers of aquaculture tanks, water recirculation systems, and automatic underwater sensors. Taking this further, AAG collaborated with Surbana Jurong to conceptualise a modular and scalable farm, in which “floating ponds” can be set up anywhere in an urban environment such as underutilised spaces. The concept features vertically stacked fish raceways that allow production capacity to be scaled up within limited space. The fish farm is designed to be self-sustaining, with a

closed-loop ecosystem where water filtration, nutrient production, and harvesting of solar energy take place.

As these bold new-generation farming professionals continue to push the envelope, we will be able to strengthen Singapore’s food security, and possibly export our food and technologies, too.

These companies were among a host of forward agri-technologists showcased in the ‘Growing More with Less’ exhibition (6 September 2017 to 31 October 2017), organised by the Urban Redevelopment Authority in partnership with AVA.

IMPROVING FOOD EXPORT CERTIFYING PROCESS

New pilot scheme reduces time and costs for industry to obtain Food Export Certificates.

AVA regulates and facilitates the export and trans-shipment of food. Relevant licences and permits must be obtained before meat, fish, and eggs can be exported or trans-shipped. In addition, importing countries may require consignments to be accompanied by official food export documents. Thus, AVA also issues Export Health Certificates for meat, fish, and dairy products; Food Export (FoodEx) Certificates for processed products; and Free Sale Certificates.

The issuance of FoodEx Certificates involves booking of appointments, as well as waiting and paying for AVA to inspect, collect samples, and conduct laboratory testing of samples from all export consignments. As part of our regular review of our programmes, and taking into consideration industry's feedback, a FoodEx accreditation scheme was piloted in May 2017.

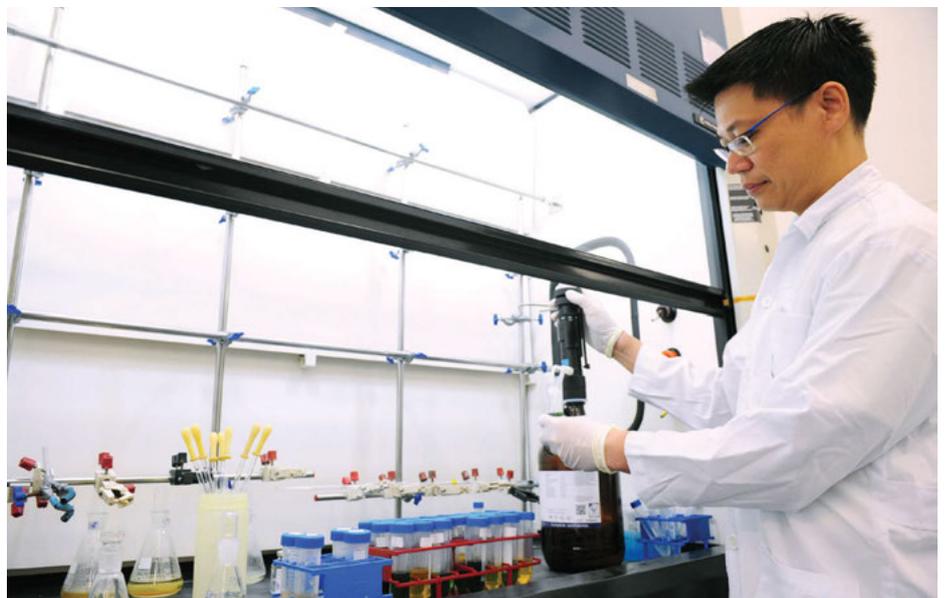
Benefits of pilot scheme

Under the pilot scheme, AVA accredits companies that maintain robust internal controls and food safety standards. Accredited exporters need

not have every export consignment inspected and/or sampled for testing in order for AVA's FoodEx Certificates to be issued. As a result, accredited establishments enjoy savings in:

- **Costs** for inspection and laboratory tests, which are no longer required. The need and cost for storage is also reduced, as products can move out faster without having to wait for inspection and sampling to be conducted.
- **Time** required to obtain the FoodEx Certificate is reduced to three working days from 10-14 days.

In cases where importing countries do not recognise this accreditation scheme, the usual inspection, sampling, and testing process will apply. Currently, two companies – Meiji Sekia and Nestlé Singapore – are accredited under the scheme. To date, importing countries have responded well to this pilot. Both companies have been able to successfully export their consignments to China, India, Indonesia, Cyprus, Spain, Arab states, and African Union member states, within a shorter time-frame.



■ Before the pilot programme, to obtain a Food Export Certificate, every export consignment must undergo sampling and laboratory testing.



■ At the PEP-SBF Awards Ceremony on 10 Nov 2017: (L-R) SFMA President Mr Thomas Pek; Senior Parliamentary Secretary for Trade and Industry Ms Low Yen Ling; Director for Surveillance & Compliance Department (Food Establishment Regulation Group, AVA) Ms Shirley Chua; and AVA officers.

According to Meiji Sekia's Quality Control Manager Mr Chew Keng Guan, it used to take longer to apply for FoodEx certification. Now, the pilot scheme "has improved the process cycle time, as we no longer need to wait for an AVA officer to come and collect samples of our consignments," Mr Chew said.

Quality Assurance Manager for Nestlé Singapore, Ms Lisa Low, also appreciates the benefits of the pilot scheme: "We are very happy with it, as it has helped our multiple departments save time."

A timely initiative

This FoodEx initiative earned AVA the 2017 Pro-Enterprise Panel-Singapore Business Federation (PEP-SBF) Award for Best Suggestion (Supporting Agency). The Singapore Food Manufacturers' Association (SFMA), which mooted the feedback on FoodEx certification, took home the PEP-SBF Award for Best

Suggestion (Suggestor) [sic]. This award category recognises private-public collaborations that led to changes in rules and regulations.

SFMA President Mr Thomas Pek feels that this pilot scheme is timely, given the business environment that food manufacturers currently operate in. "In the global food trading business, we are seeing increased competition from exporters in other countries who are constantly improving their products and food safety standards. They are moving faster and operating at lower costs. With reduced fees and time required to obtain the FoodEx Certificate, we will have a better chance at keeping this industry alive and thriving. AVA has shown that it is nimble and active in helping the industry do better."

As an industry leader, Mr Pek also urged accredited members under the FoodEx pilot scheme to remain prudent and responsible in upholding food safety standards. He said, "Singapore's food safety system and exports are trusted worldwide. It is crucial that we do not tarnish our own good reputation."

AVA is looking to extend this pilot to more traders, as this will allow a representative sample of data to be collected and studied. Thereafter, we will fine-tune the scheme so that the certification process is recognised by more importing countries. AVA will also continue to co-regulate with accredited members of the pilot scheme to ensure that exports meet all food safety standards and requirements.

MANAGING STRAY DOGS HUMANELY

AVA, working with animal welfare groups and veterinarians, to roll out Trap-Neuter-Release-Manage programme to manage stray dog population.

Working closely with animal welfare groups and veterinarians, AVA will be embarking on a five-year Trap-Neuter-Release-Manage programme to manage the stray dog population in Singapore. The programme is expected to begin in the second half of 2018.

Humane, science-based method to manage stray dogs

Stray dogs are constantly exposed to the elements and face various hazards like traffic, starvation, and disease. Those that return to their feral instincts may pose a danger to the public, especially when the dogs are in packs. Stray dogs are also a potential reservoir of diseases such as rabies, a fatal viral disease that can be spread to humans through the saliva or bite from an infected animal.

The Trap-Neuter-Release-Manage programme involves humanely catching stray dogs and sterilising them. Efforts will be made to re-home as many of the sterilised

animals as possible. Those that are unable to be re-homed will be released at suitable locations to live out their lives naturally.

The target is to sterilise more than 70 percent of the stray dogs in Singapore within five years. Based on scientific literature and mathematical modelling, sustained sterilisation at this rate or more is necessary to stabilise a stray dog population, before it begins to shrink.

Collaboration with animal welfare groups

This programme is strongly supported by several animal welfare groups and the veterinary community. Since June 2017, AVA has been engaging with these stakeholders to seek feedback and suggestions on the initiative.

Eleven* animal welfare groups have committed to participate in the programme, and will play a crucial supportive and facilitative role in its implementation. For example, they will help to galvanise stray



■ A pair of stray dogs in Singapore.



“The Trap-Neuter-Release-Manage programme will be complemented by regulation of the pet industry to enhance traceability of dogs, control over import and export of pet dogs, licensing of pet dogs at source, and tough penalties on pet abandonment.”

*Ms Jessica Kwok
Group Director for Animal Management, AVA*

feeders and volunteers. Some animal welfare groups have also, since many years ago, rolled out their sterilisation programmes in localised areas. Their dedication and expertise will be incorporated into this nationwide approach.

“This nationwide Trap-Neuter-Release-Manage effort is a game-changer for street dogs in Singapore and we are thrilled that this is happening. We are very pleased to see so many stakeholders, including the government, animal welfare groups and veterinarians, coming together with a shared vision and approach to humanely reduce the street dog population,” said Dr Jaipal Singh Gill, Executive Director of Society for the Prevention of Cruelty to Animals (SPCA).

Dr Siew Tuck Wah, President of SOSD, also expressed support for the programme: “In Singapore, various animal welfare groups have carried out sterilisation of stray dogs over the past 30 years, but there has not been a concerted, large scale effort such as this one before. We believe that this will be the turning point for stray animal management in Singapore. This effort also proves that our society is evolving into a

more compassionate, kinder one which cares not only for its human residents but for its animals as well. We cannot be more excited and more grateful for this initiative!”

AVA will continue to work closely with the relevant stakeholders in the coming months to fine-tune the implementation details of the Trap-Neuter-Release-Manage programme. Animal welfare groups or members of the public who wish to participate in the programme can contact AVA at 1800 476 1600.

*The 11 animal welfare groups participating in AVA's Trap-Neuter-Release-Manage programme are:

- Action for Singapore Dogs
- Animal Lovers League
- Causes for Animals
- Exclusively Mongrels
- Mercylight
- OSCAS
- Noah's Ark CARES
- Purely Adoptions
- SOSD
- SPCA
- Voices for Animals

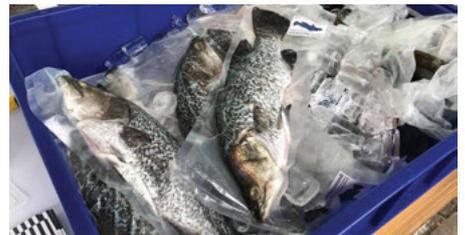


SG FARMERS' MARKET RETURNS FOR LUNAR NEW YEAR

AVA, in collaboration with the Singapore Agri-Food Enterprises Federation Limited (SAFEF), organised the second SG Farmers' Market event on 10-11 February at Singapore Turf Club. It was a timely opportunity near the Lunar New Year period, for the public to learn more about and buy local produce. Fresh produce such as eggs, fish, vegetables, and mushrooms from 26 farmers were available.

Highlights of the event included stage programmes and cooking demonstrations hosted by Mediacorp radio deejays. Visitors were treated to samples of three Lunar New Year dishes, as well as two dishes using fish supplied by The Fish Farmer, a participating farmer at the event. Senior Minister of State for National Development & Trade and Industry Dr Koh Poh Koon also came to show his support for local farmers.

SAFEF founding member and participating farmer at the event, Mr Frank Tan from Marine Life Aquaculture, was delighted that the threadfin fishes he harvested for the event were sold out quickly. Another participant, Ms Shirleen He from VertiVegies, also said that her team enjoyed engaging with members of the public, who were receptive of local produce and hydroponics.



MULTI-YEAR DOG LICENSING SCHEME TO PROVIDE GREATER CONVENIENCE FOR DOG OWNERS

Since 1 March 2018, AVA has allowed dog owners to apply for and renew the licences of their pet dogs for a period of up to three years. This revision will make dog licensing easier and more convenient.

Previously, dog owners could only apply for annual licences. Under the revised licensing scheme, new and existing dog owners can choose to apply for or renew their dog's

licence for a period of one, two, or three years. Dog owners who opt for a two-year license can enjoy an average discount of 10 percent, while those who opt for a three-year license can enjoy an average discount of 15 percent. In addition, a 10 percent rebate will be extended to dog owners who make payments via electronic platforms, i.e. GIRO, online, or through AXS stations.



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